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(54) POURING ELEMENT FOR A COMPOSITE PACKAGE AND COMPOSITE PACKAGE WITH A POURING ELEMENT

AUSGIESSELEMENT FÜR EINE VERBUNDPACKUNG SOWIE VERBUNDPACKUNG MIT EINEM AUSGIESSELEMENT

ÉLÉMENT VERSEUR POUR UN EMBALLAGE COMPOSITE ET EMBALLAGE COMPOSITE DOTÉ D'UN ÉLÉMENT VERSEUR

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Description

[0001] It is hereby disclosed a pouring element for a composite package, in particular for a beverage carton for liquid foods, comprising: a base body comprising a fastening flange and a pouring tube with a central axis, a cutting element arranged and moveably guided in the pouring tube, first guide means formed in the pouring tube, and second guide means formed on the cutting element, wherein the first and second guide means cooperate correspondingly, wherein the first guide means is a rib being arranged on the inner wall of the pouring tube, wherein the rib is divided into three roughly identical circumferential sections, wherein each of these circumferential sections comprises a high level section for the initial position of the cutting element, a low level section for the end position of the cutting element, and an intermediate level section for predominantly rotational movement of the cutting element, wherein each high level section is connected to an intermediate level section by a first transitional section, and wherein each intermediate level section is connected to a low level section by a second transitional section.

[0002] It is also disclosed a composite package with such a pouring element. In the field of packaging technology composite packages have long been part of the prior art. Thus, beverage cartons for example consist of various packaging materials such as paper and plastics, which when joined over their solid area and printed form a packaging laminate. The layer structure can vary depending on requirements, so that for example for aseptic contents a barrier layer is additionally incorporated in order to achieve a good barrier effect against gases and light, for example a barrier layer made from aluminium, polyamide (PA) or ethylene vinyl alcohol (EVOH). Often - but not always - the laminate is also cut to the size of the packaging during its production and in this way so called packaging pre-cut parts (blanks) are formed. Alternatively the packaging laminate is also supplied as an endless material (rolled goods) and is only later cut to size.

[0003] The actual forming and filling of the packaging and closing of the latter to produce a container takes place in a packaging machine, which because of its main functions is often also called a form/fill/seal machine. Typical contents are mainly liquid foods, such as for example beverages, soups or yoghurt. Thickened, pasty or lumpy products or the like are also conceivable.

[0004] Packagings of the aforementioned type are sometimes also provided with pouring elements. Apart from allowing a controlled pouring, these as a rule also provide for the possibility of re-closure. Not infrequently, and principally with aseptic use, a first-opening function for the packaging is also envisaged. In this case the previously gastight sealed packaging is opened for the first time. This can take place for example by means of a ring pull or a pull tab or also by means of a piercing and/or cutting device. Such piercing and/or cutting devices are often formed as sleeve-shaped cutting elements (e.g. cutting rings), which are coupled for example to the screw cap via drive means, so that by means of the rotational actuation of the screw cap the packaging is simultaneously cut open.

[0005] For example, European patents EP 3 464 089 B1 and EP 3 464 090 B1 disclose three-part pouring elements. While these pouring elements have many advantages, it has been found that under certain circumstances (in particular with smaller pouring elements), these pouring elements are not able to consistently cut and remove the layers of the packaging material completely from the pouring tube.

[0006] Against this background, the object of the invention is to improve the opening performance of the pouring element.

[0007] This object is achieved with a pouring element according to claim 1.

[0008] It is hereby disclosed a pouring element for a composite package, in particular for a beverage carton for liquid foods. The pouring element comprises a base body with a fastening flange and a pouring tube with a central axis. The fastening flange can be attached to a package and the pouring tube serves to pour out the content of the package through the pouring tube. The pouring element also comprises a cutting element that is arranged and moveably guided in the pouring tube. The cutting element can be formed as a circular cutting ring. Moreover, the pouring element comprises first guide means that are formed in the pouring tube, and second guide means that are formed on the cutting element, wherein the first and second guide means cooperate correspondingly. The first guide means is a rib being arranged on the inner wall of the pouring tube. The rib can be formed as one continuous rib or, alternatively, consist of several parts which are separated from each other (e.g. separated by recesses). Preferably, the rib is arranged over the whole circumference of the inner wall of the pouring tube. The rib is divided into three roughly identical circumferential sections. If the rib consists of three separate parts, it is preferred that each of the three circumferential sections corresponds to one of the three parts of the rib. Each of these three sections could preferably extend over about 120°. Each of these circumferential sections comprises a high level section for the initial position of the cutting element, a low level section for the end position of the cutting element, and an intermediate level section for predominantly or even pure rotational movement of the cutting element. The high level section is connected to an intermediate level section by a first transitional section, and each intermediate level section is connected to a low level section by a second transitional section.

[0009] In order to improve the opening performance of the pouring element, it is envisaged that each intermediate level section extends around the central axis over an extension angle which is at least 35°. Alternatively, it can be envisaged that each intermediate level section ex-

tends around the central axis over an extension angle which is at least 40°, preferably at least 45°. An increased extension angle of the intermediate level section facilitates an extended rotation of the cutting element. In other words: the cutting element can rotate further and consequently, provide a better opening performance. In particular, is has been recognized that the number of unsuccessful openings (incomplete removal of the packaging material in the pouring tube) is significantly reduced when the cutting element can rotate further. An extended cutter rotation, in particular an extended intermediate level section, can be achieved by making other sections of the rib shorter / more compact, such as the low level section and/or the second transitional section.

[0010] Since the cutting element can be held up in three places (one per circumferential section), there exists a possibility that it may tilt slightly during opening and thus block further movement. This danger is mostly negligible during the transitional sections; the cutting element is following a predominantly piercing path. On the other hand, the forces while turning in the intermediate level section may be considerably higher as the package weakening needs to be slowly torn open (over a large turning angle). Said forces may also be higher near the frontmost of the cutting teeth which leads to an uneven force distribution across these three points. Although this uneven force distribution cannot be truly eliminated, the extended cutter rotation tries to mitigate these problems by spreading them out over a longer path with more constant stabilization. This guarantees that the intended cutting portion is severed before the guide means reach the second transitional section.

[0011] According to a further teaching of the pouring element, the extension angle of the intermediate level section extends over at least 60%, in particular over at least 70%, preferably over at least 75% of the sum of the extension angle of the low level section, the extension angle of the second transitional section and the extension angle of the intermediate level section. The rib is divided into three roughly identical circumferential sections, each of them preferably extending over about one third of the circumference, thus about 120°. The three circumferential sections may be slightly smaller than 120° so that there is a gap between adjacent circumferential sections or the three circumferential sections may be slightly bigger than 120° so that adjacent circumferential sections partly overlap. In order to achieve an improved opening performance, a large proportion of this circumferential section shall be used for a pure rotation of the cutting element. The extension angle of the intermediate level section shall therefore at least extend over at least 60%, 70% or 75% of sum of three adjoining angles, namely the extension angle of the low level section, the extension angle of the second transitional section and the extension angle of the intermediate level section.

[0012] Another teaching of the pouring element envisages that the second transitional section is tilted at a tilting angle that is smaller than 10°, preferably between 2° and 6° relative to the vertical/axial direction. A very steep (almost vertical) shape of the second transitional section has the effect that the second transitional section requires less space in the circumferential direction which provides more space for the intermediate level section and therefore for the pure rotational movement of the cutting element. Specifically, the change from pure rotation to the piercing transitional path is problematic when thinking of a cutting element blockage and needs to be kept as short as possible, i.e. a sharp angle of nearly 90° between intermediate level section and second transitional section which translates into the aforementioned tilting angle smaller than 10°.

[0013] According to a further teaching of the pouring element, the second guide means is formed by three pairs of cams that are distributed over the circumference of the cutting element. As the first guide means is a rib with three roughly identical circumferential sections, the second guide means can cooperate especially well with the first guide means if they also comprise three roughly identical parts such as three pairs of cams which are distributed evenly over the circumference of the cutting element. Moreover, by providing three pairs of cams, an optimal compromise is obtained between material consumption and guide function. Such pairs of cams enclose the rib of the first guide means. A pair of cams has the advantage that the first cam can be arranged above the rim, whereas the second cam can be arranged below the rim so that the cutting element can be guided precisely. This provides an additional restriction on the degrees of freedom of the forced guidance, so that this becomes more reliable and accurate.

[0014] According to the aforementioned teaching of the pouring element, it can be further envisaged that each pair of cams has a gap between both cams that has a height between 1,5 times and 3 times, in particular between 1,5 times and 2,5 times of the height of the intermediate level section. The height of the gap as well as the height of the intermediate level section is measured along a direction parallel to the central axis of the pouring tube. It is preferred that the height of the gap between both cams is less than 1,5 mm in any case. These dimensions stabilize the motion of the cutting element, especially during translational movement where forces could tilt the cutting element otherwise.

[0015] Another teaching of the pouring element envisages that the high level section of the rib has a recessed area with a decreased rib depth. The rib depth is measured in the radial direction of the pouring tube. A reduced radial depth of the rib simplifies the assembly process of the cutting element and the base body, reduces forces and the likelihood of either the rib or the cams breaking off. Moreover, a reduced radial rib depth makes smaller and cheaper cams possible.

[0016] According to a further teaching of the pouring element, the pouring tube has an inner diameter of less than 20 mm, preferably between 15 mm and 18 mm. Pouring elements with an inner diameter in this range are

rather small pouring elements. It is particularly difficult for smaller pouring elements to consistently cut and remove the layers of the packaging material completely from the pouring tube because it is more difficult to generate sufficiently large torques/forces compared to larger pouring elements. The invention is therefore particularly useful for smaller pouring elements.

[0017] Another teaching of the pouring element envisages that a closure cap is connected to the base body and that the cutting element can be driven by drive flanks formed on the closure cap that act on drive elements arranged on the cutting element. This teaching further envisages that the drive flanks have a thickness which is at least 0,6 mm, preferably between 0,6 mm and 0,8 mm. A closure cap makes possible the re-closure of a composite package whose contents have been partially consumed. The first-opening rotational movement can be used to drive the cutting element at the same time ("single action"). If the drive is realized over drive flanks (on the cap) and webs (on the cutting element), a particularly advantageous coupling is provided. In order to transfer the required torque without excessive bending, the drive flanks shall have a minimum thickness in the indicated range.

[0018] According to a further teaching of the pouring element, the two drive flanks are arranged on the closure cap and that two corresponding drive elements are arranged on the cutting element. In order to optimize the cooperation between the drive flanks and the drive element, the number of drive flanks on the closure cap shall correspond with the number of drive elements on the cutting element. Moreover, by providing two drive flanks/drive elements, an optimal compromise is obtained between material consumption and drive function. Especially for smaller closures two drive elements allow for more design space and thus optimized elements which can still transmit the required amount of force for opening. In contrast, more than two such elements have proven to be suboptimal since the elements needed to be designed more weakly as a trade-off when trying to fit them into such a closure.

[0019] According to a further teaching of the pouring element, one of the drive elements is arranged in an area which is free of any severing means. In other words, one of the drive elements shall be arranged in a circumferential stretch which is free of any severing means/teeth, for example between the last tooth and the first tooth. This arrangement of one of the drive elements improves the force transmission from the closure cap to the cutting element and then to the severing means / teeth. The main forces are generated close to the front/first tooth which increases the stability of the cutting element guidance and lowers the chances of tilting the ring. This also improves the rigidity of the area with the recess.

[0020] The invention is also defined by a composite package, in particular a beverage carton for liquid food stuffs, with a package gable panel suitable for accommodating a pouring element, wherein the package gable panel has a local package material weakness, and a pouring element according to one of claims 1 to 12 is positioned and permanently connected so that during the first actuation of the pouring element the cutting element is movable towards the package material weakness, thereby opening the composite package so that it is ready for emptying the contents. The pouring element and composite package should always closely match to one another. Thus, an exact positioning on a package gable panel provided for this purpose is of decisive importance. On the one hand the pouring element must remain connected to the composite package, and on the other hand the cutting element should engage exactly in the package material weakness created for this purpose. The cutting element cuts open an arc-shaped line in the packaging material weakness where the remaining part between start and end point of said arc keeps the mostly severed part of the packaging material weakness attached to the rest of the package. The thusly attached part will be pushed aside by the cutting element when it continues moving towards the second transitional section and into the low level section. Only this procedure allows a complete opening of the package, which is then ready for the emptying of the contents.

[0021] Another teaching of the composite package envisages that the packaging material weakening is formed as a prelaminated hole. Such a special preparation of the package material is suitable specifically for the opening by a material-optimised and production-optimised pouring element, since the piercing does not have to take place through the full material of the composite package but only through some of the layers.

[0022] It is further disclosed that the cutting element may comprise a recess with two shoulders that are inclined upwards relative to a circumferential curve at a shoulder angle that is at least 15°, preferably at least 25°. The cutting element comprises a recess that is free of any severing means/teeth and comprises two shoulders that are inclined upwards (relative to a circumferential direction) at a shoulder angle.

[0023] The invention is described in more detail hereinafter with the aid of the drawings that simply illustrate one exemplary embodiment. In the drawings:

Fig. 1: shows a composite package according to the invention with a pouring element in a perspective view from the front and above,

Fig. 2: shows a pouring element according to the invention in a perspective view from above,

Fig. 3: shows the base body of the pouring element from Fig. 2 in a perspective view from above,

Fig. 4: shows the base body of Fig. 3 in a vertical section along the line IV-IV,

Fig. 5: shows the base body of Fig. 3 in a vertical

section along the line V-V,

Fig. 6: shows the base body of Fig. 3 in a top view,

Fig. 7: shows the cutting element of the pouring element of Fig. 2 in a perspective view from above,

Fig. 8: shows a pair of guide cams of the cutting element of Fig. 7 in a detailed view, and

Fig. 9: shows the closure cap of the pouring element of Fig. 2 in a perspective view from inside.

[0024] The embodiment illustrated in Fig. 1 of a composite package P according to the invention shows the package P as a beverage carton. The composite package P consists of a package material, which forms a package laminate from a series of flat joined-together materials: polymer layers are laminated on both sides of a carton carrier layer and an additional barrier layer (here: aluminium) screens the product in the composite package P against undesired environmental influences (light, oxygen).

[0025] The composite package P has in the edge region a package gable panel 1, to which a pouring element A according to the invention is applied and permanently attached. When the pouring element A is actuated for the first time, a package material weakness region - here covered by the pouring element A - is cut and the composite package P is thereby opened for the first time, which is then ready for emptying the contents. This weakness region in the illustrated and thus preferred exemplary embodiment is implemented as an over-coated perforation, which is formed during production: for this, a hole is punched out of the carton carrier layer, so that after it has been coated over a local weakness is produced. This still guarantees the usual barrier functions (water, gas and possibly light).

[0026] Fig. 2 shows the pouring element A according to the invention, whose parts individually produced in an injection moulding method are installed (assembled) ready for use: a base body 2, a - in this case concealed - cutting element 3 (illustrated in Fig. 7) which is formed as a circular cutting ring and a closure cap 4. The pouring element A that is now functionally ready for use is then applied via a fastening flange 5 to the composite package P and permanently connected by, e.g. means of a hot-melt adhesive.

[0027] When the closure cap 4 is actuated for the first time by the consumer, the unscrewing movement of the closure cap 4 is transferred to the cutting element 3 guided in the base body 2, which cuts the composite package P in the region of the weakness. The product can then be poured out through the thus created opening.

[0028] The base body 2 is illustrated in Fig. 3, which in addition to the fastening flange 5 also consists of a pouring tube 6 that has an inner diameter D_{i6}. In the installed and functionally ready state the cutting element 3 is arranged in the pouring tube 6 and is forcibly guided over first guide means 7 formed on the inner wall of the pouring tube 6. Corresponding second guide means 8 formed on the cutting element 3 (see Figs. 7 and 8) enable this guidance. The first guide means 7 is formed by a rib 9.

[0029] Figs. 4 and Fig. 5 show two differing view points of the vertically sectioned halves of the base body 2 with the respective inner wall of the pouring tube 6, on which the outline of the projecting rib 9 is visible. The pouring tube 6 is shaped roughly cylindrically and has a central axis C. is The rib 9 has in the upper region a high level section 10, which forms the guide section for the initial position of the cutting element 3. If the cutting element 3 is now caused to move, it follows the first guide means 7 and is moved from the high level section 10 over a section of variable pitch to a low level section 11, where the end position of the cutting element 3 is reached. The actual opening process of the composite package P takes place between the high level section 10 and low level section 11. For this, the severing means 12 formed at the end on the cutting element 3 pierce and cut (see Fig. 7) the composite package P in the region of the over-coated perforation.

[0030] In the illustrated and thus preferred embodiment an intermediate level section 13 is formed between the high level section 10 and low level section 11 on the rib 9, which produces a pure rotation (without axial movement along the central axis C) of the cutting element 3, whereby over this region the severing means 12 cut instead of pierce the over-coated perforation. The intermediate level section 13 has a height H_{13} which is measured along a direction parallel to the central axis C of the pouring tube 6.

[0031] In addition to the three purely circumferential sections (high level section 10, low level section 11 and intermediate level section 13), the first guide means 7 or the rib 9 also comprises a first transitional section 14A, a section transitional section 14B and a third transitional section 14C. The first transitional section 14A connects the high level section 10 with the intermediate level section 13 and has a very steep direction (almost vertical / parallel to the central axis C). As a result of this shape, the first transitional section 14A moves the cutting element 3 downwards mainly in the axial direction ("piercing movement"). The second transitional section 14B connects the intermediate level section 13 with the low level section 11 and also has a very steep shape (almost vertical / parallel to the central axis C). The second transitional section 14B is tilted at a tilting angle β that is about 5,5° (tilted relative to the vertical / axial direction). As a result of this shape, the second transitional section 14B moves the cutting element 3 further downwards in the axial direction towards the low level section 11 until there is no more contact between the closure cap 4 and the cutting element 3 so that the cutting element 3 can no longer be moved/turned by the closure cap 4 (even when

the closure cap 4 is re-closed or re-opened later). The low level section 11 can therefore be regarded as a "parking position" for the cutting element 3. The third transitional section 14C connects the low level section 11 with the next high level section 10 and ensures that the guide means 7 or the rib 9 is completely closed so that the cutting element 3 cannot fall out.

[0032] Fig. 6 shows the base body 2 of Fig. 3 in a top view. The top view illustrates that the first guide means 7 of the base body 2 is divided into three identical circumferential sections CS, each of them extending over about 120° (3 x 120° = 360°). One of these three circumferential sections CS will be discussed in more detail: The high level section 10 extends over an extension angle α_{10} which is about 45°, the intermediate level section 13 extends over an extension angle α_{13} which is about 45°, and the low level section 11 extends over an extension angle α_{11} which is about 10°. The remaining section of about 20° (120°-45°-45°-10° = 20°) is reserved for the transition between the high level section 10 and the intermediate level section 13 (first transitional section 14A with extension angle α_{14A}) as well as for the transition between the intermediate level section 13 and the low level section 11 (second transitional section 14B with extension angle α_{14B}) and for the transition between the low level section 11 and the next high level section 10 (third transitional section 14C with extension angle α_{14C}). The high level section 10 of the rib 9 has a recessed area 10A with a decreased rib depth (measured in the radial direction).

[0033] In Fig. 7 the cutting element 3 is shown as an individual part. The already mentioned second guide means 8 is realised as cams 15, which enclose pair-wise the first guide means 7 of the rib 9 and thus form a forced guidance. Three such pairs 16 of cams 15 are formed distributed over the circumference of the cutting element 3, whereby a sufficiently good guidance of the cutting element 3 is ensured. A detailed view of such a pair 16 of cams 15 can be seen in Fig. 8. The lower cam 15 coming into contact with the lower face of the rib 9 is partially formed as a rounded contour 17, so that different sections of the rib 9 can be traversed as smoothly as possible. Between both cams 15 is a gap that has a height H_{15} measured along a direction parallel to the central axis C of the pouring tube 6. The cutting element 3 comprises severing means 12 which are formed at the lower end of the cutting element 3. The cutting element 3 also comprises a recess 21, which is free of any severing means 12 but comprises two shoulders 22. The shoulders 22 are inclined upwards (relative to a circumferential curve which is dashed in Fig. 7) at a shoulder angle α_{22} that is at least 15°, preferably at least 25°. The recess 21 leads to an arc-shaped severed line as the area of the package weakening below it is mostly left intact. This intact piece serves as a hinge for the rest of severed part of the package weakening so that it can be pushed to the side and away from the pouring hole. The recess 21 should span an angle (from the first to the last severing means) smaller than a circumferential section CS to enable a reliable opening. The recess 21 has also the effect that the package can be emptied completely because the recess 21 can act like an outlet which allows the content of the package to get over the circular cutting element 3 into the pouring tube 6 when the package is held upside down.

[0034] Fig. 9 shows the closure cap 4 as an individual part. Drive flanks 18 are formed on the inner surface of the cover surface, which act on drive elements 19, which are formed as webs, projecting on the inside of the cutting element 3 (see Fig. 7). The closure cap 4 is thereby coupled to the cutting element 3 and the desired force and torque transmission can take place. The drive flanks 18 have a thickness 20 which is at least 0,6 mm, preferable between 0,6 mm and 0,8 mm.

List of reference signs:

[0035]

1:	gable panel
2:	base body
3:	cutting element
4:	closure cap
5:	fastening flange
6:	pouring tube
7:	first guide means
8:	second guide means
9:	rib
10:	high level section
11:	low level section
12:	severing means
13:	intermediate level section
14A:	first transitional section
14B:	second transitional section
14C:	third transitional section
15:	cam
16:	pair of cams
17:	rounded contour
18:	drive flank
19:	drive elements
20:	thickness
21:	recess
22:	shoulder

α_{10}:	extension angle (of the high level section 10)
α_{11}:	extension angle (of the low level section 10)
α_{13}:	extension angle (of the intermediate level section 10)
α_{14A}:	extension angle (of the first transitional section 14A)
α_{14B}:	extension angle (of the second transitional section 14B)
α_{14C}:	extension angle (of the third transitional section 14C)
α_{22}:	shoulder angle

β: tilting angle (of the second transitional section 14B)

A: pouring element
C: central axis
CS: circumferential section
D_{i6}: inner diameter (of poring tube 6)
H_{13}: height (of the intermediate level section 13)
H_{15}: height (of the gap between the cams 15)
P: package

Claims

1. Pouring element (A) for a composite package, in particular for a beverage carton for liquid foods, comprising:

- a base body (2) comprising a fastening flange (5) and a pouring tube (6) with a central axis (C),
- a cutting element (3) arranged and moveably guided in the pouring tube (6),
- first guide means (7) formed in the pouring tube (6), and
- second guide means (8) formed on the cutting element (3),
- wherein the first and second guide means (7, 8) cooperate correspondingly,
- wherein the first guide means (7) is a rib (9) being arranged on the inner wall of the pouring tube (6),
- wherein the rib (9) is divided into three roughly identical circumferential sections (CS),
- wherein each of these circumferential sections (CS) comprises a high level section (10) for the initial position of the cutting element (3), a low level section (11) for the end position of the cutting element (3), and an intermediate level section (13) for predominantly rotational movement of the cutting element (3),
- wherein each high level section (10) is connected to an intermediate level section (13) by a first transitional section (14A), and
- wherein each intermediate level section (13) is connected to a low level section (11) by a second transitional section (14B),

characterized in that
each intermediate level section (13) extends around the central axis (C) over an extension angle (α_{13}) which is at least 35°.

2. Pouring element (A) according to claim 1, **characterized in that**
each intermediate level section (13) extends around the central axis (C) over an extension angle (α_{13}) which is at least 40°, preferably at least 45°.

3. Pouring element (A) according to claim 1 or claim 2, **characterized in that**
the extension angle (α_{13}) of the intermediate level section (13) extends over at least 60%, in particular over at least 70%, preferably over at least 75% of the sum of the extension angle (α_{11}) of the low level section (11), the extension angle (α_{14B}) of the second transitional section (14B) and the extension angle (α_{13}) of the intermediate level section (13).

4. Pouring element (A) according to one of claims 1 to 3, **characterized in that**
the second transitional section (14B) is tilted at a tilting angle (β) that is smaller than 10°, preferably between 2° and 6° relative to the vertical/axial direction.

5. Pouring element (A) according to one of claims 1 to 4, **characterized in that**
the second guide means (8) is formed by three pairs (16) of cams (15) that are distributed over the circumference of the cutting element (3).

6. Pouring element (A) according to claim 5, **characterized in that**
each pair (16) of cams (15) has a gap between both cams (15) that has a height (H_{15}) between 1,5 times and 3 times, in particular between 1,5 times and 2,5 times of the height (H_{13}) of the intermediate level section (13).

7. Pouring element (A) according to one of claims 1 to 6, **characterized in that**
the high level section (10) of the rib (9) has a recessed area (10A) with a decreased rib depth.

8. Pouring element (A) according to one of claims 1 to 7, **characterized in that**
the pouring tube (6) has an inner diameter (D_{i6}) of less than 20 mm, preferably between 15 mm and 18 mm.

9. Pouring element (A) according to one of claims 1 to 8, **characterized in that**
a closure cap (4) is connected to the base body (2) and the cutting element (3) can be driven by drive flanks (18) formed on the closure cap (4) that act on drive elements (19) arranged on the cutting element (3).

10. Pouring element (A) according to claim 9, **characterized in that**
the drive flanks (18) have a thickness (20) which is at least 0,6 mm, preferably between 0,6 mm and 0,8 mm.

11. Pouring element (A) according to claim 9 or 10, **characterized in that**
two drive flanks (18) are arranged on the closure cap

(4) and that two corresponding drive elements (19) are arranged on the cutting element (3).

12. Pouring element (A) according to claim 11, **characterized in that** one of the drive elements (19) is arranged in an area which is free of any severing means (12).

13. Composite package (P), in particular a beverage carton for liquid food stuffs, with a package gable panel (1) suitable for accommodating a pouring element (A), wherein the package gable panel (1) has a local package material weakness, and a pouring element (A) according to one of claims 1 to 12 is positioned and permanently connected so that during the first actuation of the pouring element (A) the cutting element (3) is movable towards the package material weakness, thereby opening the composite package (P) so that it is ready for emptying the contents.

14. Composite package (P) according to claim 13, **characterized in that** the package material weakening is formed as a prelaminated hole.

Patentansprüche

1. Ausgießelement (A) für eine Verbundverpackung, insbesondere für einen Getränkekarton für flüssige Lebensmittel, umfassend:

- einen Grundkörper (2), der einen Befestigungsflansch (5) und ein Ausgießrohr (6) mit einer Mittelachse (C) umfasst,
- ein Schneidelement (3), das in dem Ausgießrohr (6) angeordnet ist und beweglich geführt wird,
- erste Führungsmittel (7), die in dem Ausgießrohr (6) ausgebildet sind, und
- zweite Führungsmittel (8), die an dem Schneidelement (3) ausgebildet sind,
- wobei die ersten und zweiten Führungsmittel (7, 8) entsprechend zusammenwirken,
- wobei die ersten Führungsmittel (7) eine Rippe (9) ist, die an der Innenwand des Ausgießrohrs (6) angeordnet ist,
- wobei die Rippe (9) in drei etwa identische Umfangsabschnitte (CS) unterteilt ist,
- wobei jeder von diesen Umfangsabschnitten (CS) einen erhöhten Abschnitt (10) für die Anfangsposition des Schneidelements (3), einen vertieften Abschnitt (11) für die Endposition des Schneidelements (3) und einen Abschnitt mittlerer Höhe (13) für eine überwiegende Drehbewegung des Schneidelements (3) umfasst,
- wobei jeder erhöhte Abschnitt (10) durch einen ersten Übergangsabschnitt (14A) mit einem Abschnitt mittlerer Höhe (13) verbunden ist, und
- wobei jeder Abschnitt mittlerer Höhe (13) durch einen zweiten Übergangsabschnitt (14B) mit einem vertieften Abschnitt (11) verbunden ist,

dadurch gekennzeichnet, dass
sich jeder Abschnitt mittlerer Höhe (13) über einen Erstreckungswinkel (α_{13}), der mindestens 35° beträgt, um die Mittelachse (C) herum erstreckt.

2. Ausgießelement (A) nach Anspruch 1, **dadurch gekennzeichnet, dass** sich jeder Abschnitt mittlerer Höhe (13) über einen Erstreckungswinkel (α_{13}), der mindestens 40°, vorzugsweise mindestens 45° beträgt, um die Mittelachse (C) herum erstreckt.

3. Ausgießelement (A) nach Anspruch 1 oder Anspruch 2, **dadurch gekennzeichnet, dass** sich der Erstreckungswinkel (α_{13}) des Abschnitts mittlerer Höhe (13) über mindestens 60 %, insbesondere über mindestens 70 % und vorzugsweise über mindestens 75 % der Summe des Erstreckungswinkels (α_{11}) des vertieften Abschnitts (11), des Erstreckungswinkels (α_{14B}) des zweiten Übergangsabschnitts (14B) und des Erstreckungswinkels (α_{13}) des Abschnitts mittlerer Höhe (13) erstreckt.

4. Ausgießelement (A) nach einem der Ansprüche 1 bis 3, **dadurch gekennzeichnet, dass** der zweite Übergangsabschnitt (14B) mit einem Kippwinkel (β) geneigt ist, der kleiner als 10° ist und vorzugsweise zwischen 2° und 6° in Bezug auf die vertikale/axiale Richtung liegt.

5. Ausgießelement (A) nach einem der Ansprüche 1 bis 4, **dadurch gekennzeichnet, dass** die zweiten Führungsmittel (8) durch drei Paare (16) von Nocken (15) gebildet sind, die über den Umfang des Schneidelements (3) verteilt sind.

6. Ausgießelement (A) nach Anspruch 5, **dadurch gekennzeichnet, dass** jedes Paar (16) von Nocken (15) einen Spalt zwischen beiden Nocken (15) aufweist, der eine Höhe (H_{15}) zwischen dem 1,5-fachen und dem 3-fachen, insbesondere zwischen dem 1,5-fachen und dem 2,5-fachen der Höhe (H_{13}) des Abschnitts mittlerer Höhe (13) aufweist.

7. Ausgießelement (A) nach einem der Ansprüche 1 bis 6, **dadurch gekennzeichnet, dass**

der erhöhte Abschnitt (10) der Rippe (9) einen Vertiefungsbereich (10A) mit einer verringerten Rippentiefe aufweist.

8. Ausgießelement (A) nach einem der Ansprüche 1 bis 7,
dadurch gekennzeichnet, dass
das Ausgießrohr (6) einen Innendurchmesser (D_{i6}) von weniger als 20 mm und vorzugsweise zwischen 15 mm und 18 mm aufweist.

9. Ausgießelement (A) nach einem der Ansprüche 1 bis 8,
dadurch gekennzeichnet, dass
eine Verschlusskappe (4) mit dem Grundkörper (2) verbunden ist und dass das Schneidelement (3) durch Antriebsflanken (18) geführt werden kann, die an der Verschlusskappe (4) ausgebildet sind und die auf Antriebselemente (19) wirken, die an dem Schneidelement (3) angeordnet sind.

10. Ausgießelement (A) nach Anspruch 9,
dadurch gekennzeichnet, dass
die Antriebsflanken (18) eine Dicke (20) aufweisen, die mindestens 0,6 mm beträgt und vorzugsweise zwischen 0,6 mm und 0,8 mm liegt.

11. Ausgießelement (A) nach Anspruch 9 oder 10,
dadurch gekennzeichnet, dass
zwei Antriebsflanken (18) an der Verschlusskappe (4) angeordnet sind und dass zwei entsprechende Antriebselemente (19) an dem Schneidelement (3) angeordnet sind.

12. Ausgießelement (A) nach Anspruch 11,
dadurch gekennzeichnet, dass
eines der Antriebselemente (19) in einem Bereich angeordnet ist, der frei von jeglichen Trennmitteln (12) ist.

13. Verbundverpackung (P), insbesondere Getränkekarton für flüssige Lebensmittel, mit einer zur Aufnahme eines Ausgießelements (A) geeigneten Verpackungsgiebelplatte (1), wobei die Verpackungsgiebelplatte (1) eine lokale Verpackungsmaterialschwäche aufweist, und ein Ausgießelement (A) nach einem der Ansprüche 1 bis 12, das so positioniert und dauerhaft verbunden ist, dass das Schneidelement (3) während der ersten Betätigung des Ausgießelements (A) zu der Verpackungsmaterialschwäche hin beweglich ist, wodurch es die Verbundverpackung (P) so öffnet, dass sie zum Entleeren des Inhalts bereit ist.

14. Verbundverpackung (P) nach Anspruch 13,
dadurch gekennzeichnet, dass
die Verpackungsmaterialschwächung als vorlaminiertes Loch ausgebildet ist.

Revendications

1. Élément verseur (A) pour un emballage composite, en particulier pour une brique à boisson pour aliments liquides, comprenant :

- un corps de base (2) comprenant une bride de fixation (5) et un tube verseur (6) avec un axe central (C),
- un élément de coupe (3) agencé et guidé de manière mobile dans le tube verseur (6),
- un premier moyen de guidage (7) formé dans le tube verseur (6), et
- un second moyen de guidage (8) formé sur l'élément de coupe (3),
- dans lequel les premier et second moyens de guidage (7, 8) coopèrent en conséquence,
- dans lequel le premier moyen de guidage (7) est une nervure (9) agencée sur la paroi interne du tube verseur (6),
- dans lequel la nervure (9) est divisée en trois sections circonférentielles (CS) à peu près identiques,
- dans lequel chacune de ces sections circonférentielles (CS) comprend une section de niveau haut (10) pour la position initiale de l'élément de coupe (3), une section de niveau bas (11) pour la position finale de l'élément de coupe (3), et une section de niveau intermédiaire (13) pour le mouvement principalement rotatif de l'élément de coupe (3),
- dans lequel chaque section de niveau haut (10) est reliée à une section de niveau intermédiaire (13) par une première section de transition (14A), et
- dans lequel chaque section de niveau intermédiaire (13) est reliée à une section de niveau bas (11) par une seconde section de transition (14B),

caractérisé en ce que
chaque section de niveau intermédiaire (13) s'étend autour de l'axe central (C) sur un angle d'extension (α_{13}) qui est d'au moins 35°.

2. Élément verseur (A) selon la revendication 1,
caractérisé en ce que
chaque section de niveau intermédiaire (13) s'étend autour de l'axe central (C) sur un angle d'extension (α_{13}) qui est d'au moins 40°, de préférence d'au moins 45°.

3. Élément verseur (A) selon la revendication 1 ou la revendication 2,
caractérisé en ce que
l'angle d'extension (α_{13}) de la section de niveau intermédiaire (13) s'étend sur au moins 60 %, en particulier sur au moins 70 %, de préférence sur au

moins 75 % de la somme de l'angle d'extension (α_{11}) de la section de niveau bas (11), de l'angle d'extension (α_{14B}) de la seconde section de transition (14B) et de l'angle d'extension (α_{13}) de la section de niveau intermédiaire (13).

4. Élément verseur (A) selon l'une des revendications 1 à 3,
caractérisé en ce que
la seconde section de transition (14B) est inclinée à un angle d'inclinaison (β) inférieur à 10°, de préférence compris entre 2° et 6° par rapport à la direction verticale/axiale.

5. Élément verseur (A) selon l'une des revendications 1 à 4,
caractérisé en ce que
le second moyen de guidage (8) est formé par trois paires (16) de cames (15) qui sont réparties sur la circonférence de l'élément de coupe (3).

6. Élément verseur (A) selon la revendication 5,
caractérisé en ce que
chaque paire (16) de cames (15) présente un écartement entre les deux cames (15) qui présente une hauteur (H_{15}) comprise entre 1,5 fois et 3 fois, notamment entre 1,5 fois et 2,5 fois la hauteur (H_{13}) de la section de niveau intermédiaire (13).

7. Élément verseur (A) selon l'une des revendications 1 à 6,
caractérisé en ce que
la section de niveau haut (10) de la nervure (9) présente une zone en retrait (10A) avec une profondeur de nervure réduite.

8. Élément verseur (A) selon l'une des revendications 1 à 7,
caractérisé en ce que
le tube verseur (6) présente un diamètre interne (D_{i6}) inférieur à 20 mm, de préférence compris entre 15 mm et 18 mm.

9. Élément verseur (A) selon l'une des revendications 1 à 8,
caractérisé en ce que
un capuchon de fermeture (4) est relié au corps de base (2) et l'élément de coupe (3) peut être entraîné par des flancs d'entraînement (18) formés sur le capuchon de fermeture (4) qui agissent sur des éléments d'entraînement (19) agencés sur l'élément de coupe (3).

10. Élément verseur (A) selon la revendication 9,
caractérisé en ce que
les flancs d'entraînement (18) présentent une épaisseur (20) d'au moins 0,6 mm, de préférence comprise entre 0,6 mm et 0,8 mm.

11. Élément verseur (A) selon la revendication 9 ou 10,
caractérisé en ce que
deux flancs d'entraînement (18) sont agencés sur le capuchon de fermeture (4) et que deux éléments d'entraînement (19) correspondants sont agencés sur l'élément de coupe (3).

12. Élément verseur (A) selon la revendication 11,
caractérisé en ce que
l'un des éléments d'entraînement (19) est agencé dans une zone qui est exempte de tout moyen de sectionnement (12).

13. Emballage composite (P), en particulier une brique à boisson pour denrées alimentaires liquides, avec un panneau à pignon d'emballage (1) adapté au logement d'un élément verseur (A), dans lequel le panneau à pignon d'emballage (1) présente une faiblesse locale du matériau d'emballage, et un élément verseur (A) selon l'une des revendications 1 à 12 est positionné et relié de manière permanente de sorte que lors de la première activation de l'élément verseur (A), l'élément de coupe (3) est mobile en direction de la faiblesse du matériau d'emballage, ouvrant ainsi l'emballage composite (P) afin qu'il soit prêt pour vider le contenu.

14. Emballage composite (P) selon la revendication 13,
caractérisé en ce que
l'affaiblissement du matériau d'emballage est formé sous la forme d'un trou prélaminé.

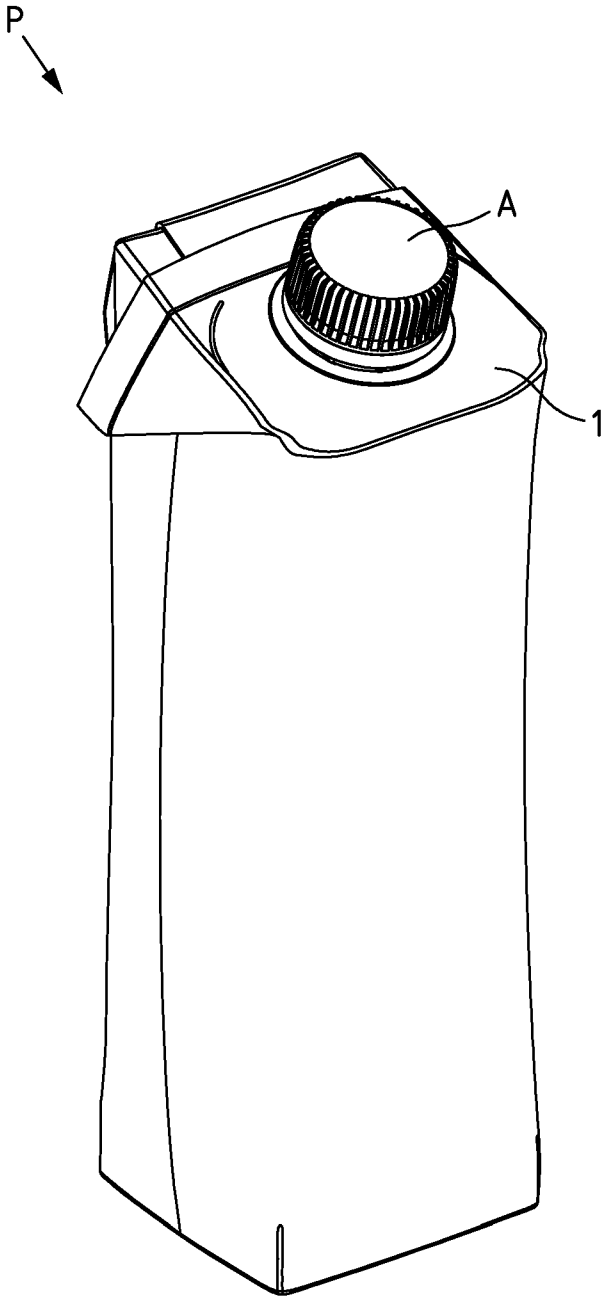

Fig.1

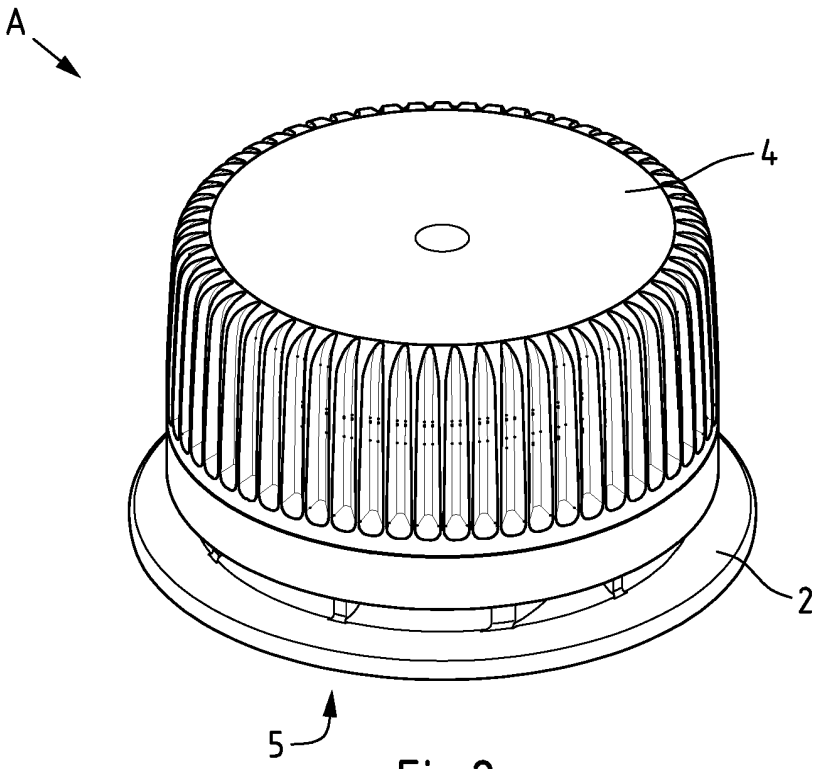

Fig.2

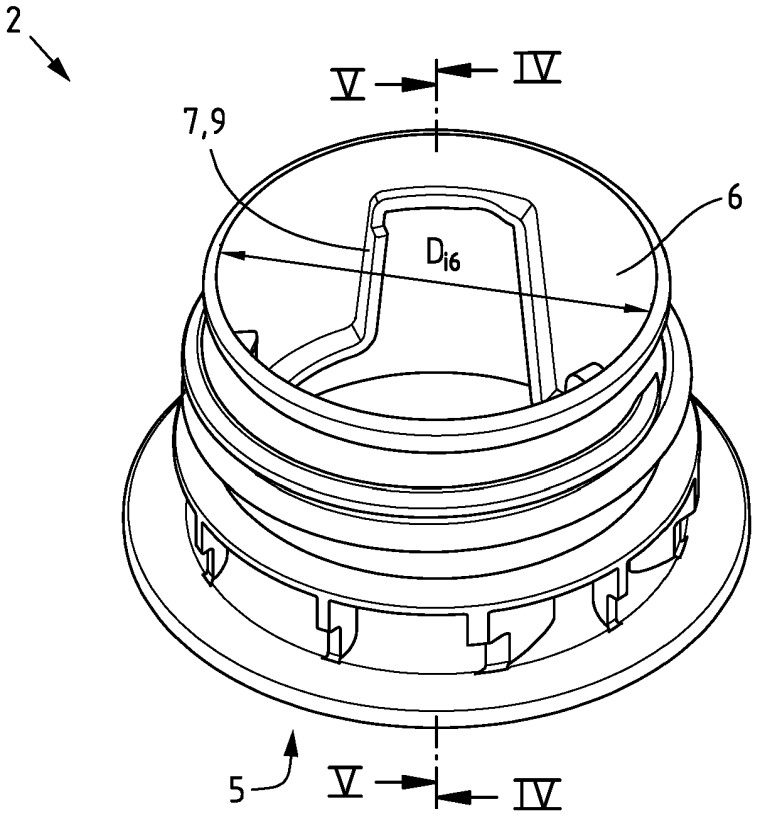

Fig.3

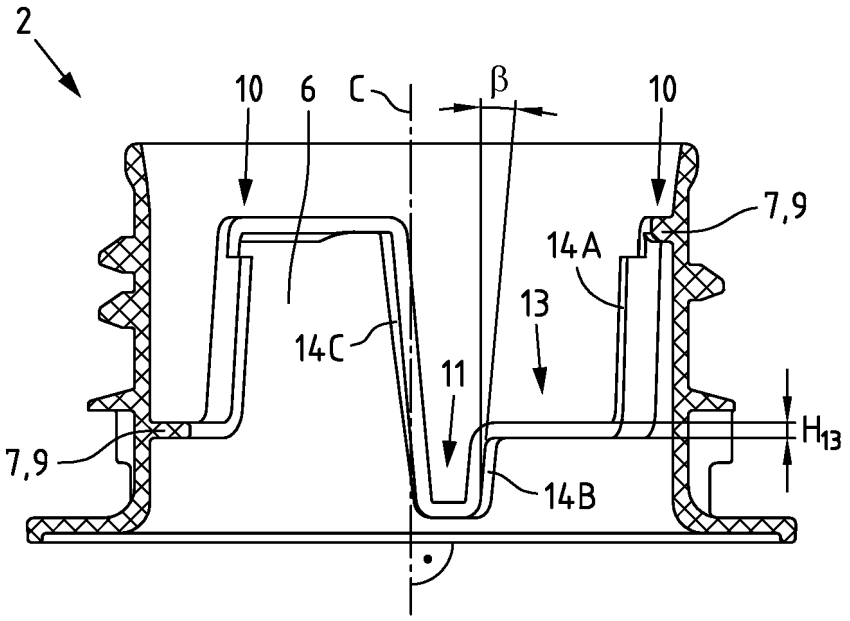
2
10
6
C
β
10
7,9
14A
13
14C
11
H13
7,9
14B

Fig.4

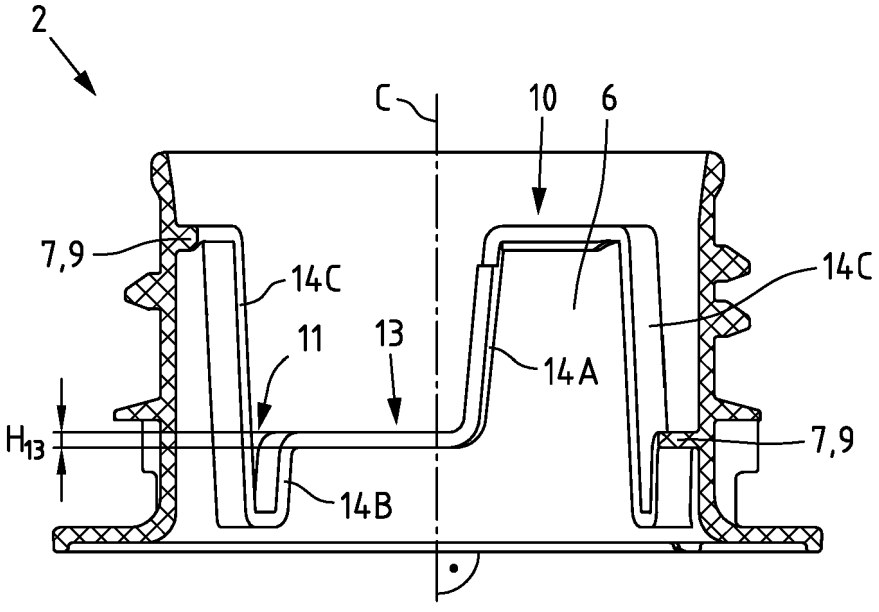
2
C
10
6
7,9
14C
14C
11
13
14A
H13
7,9
14B

Fig.5

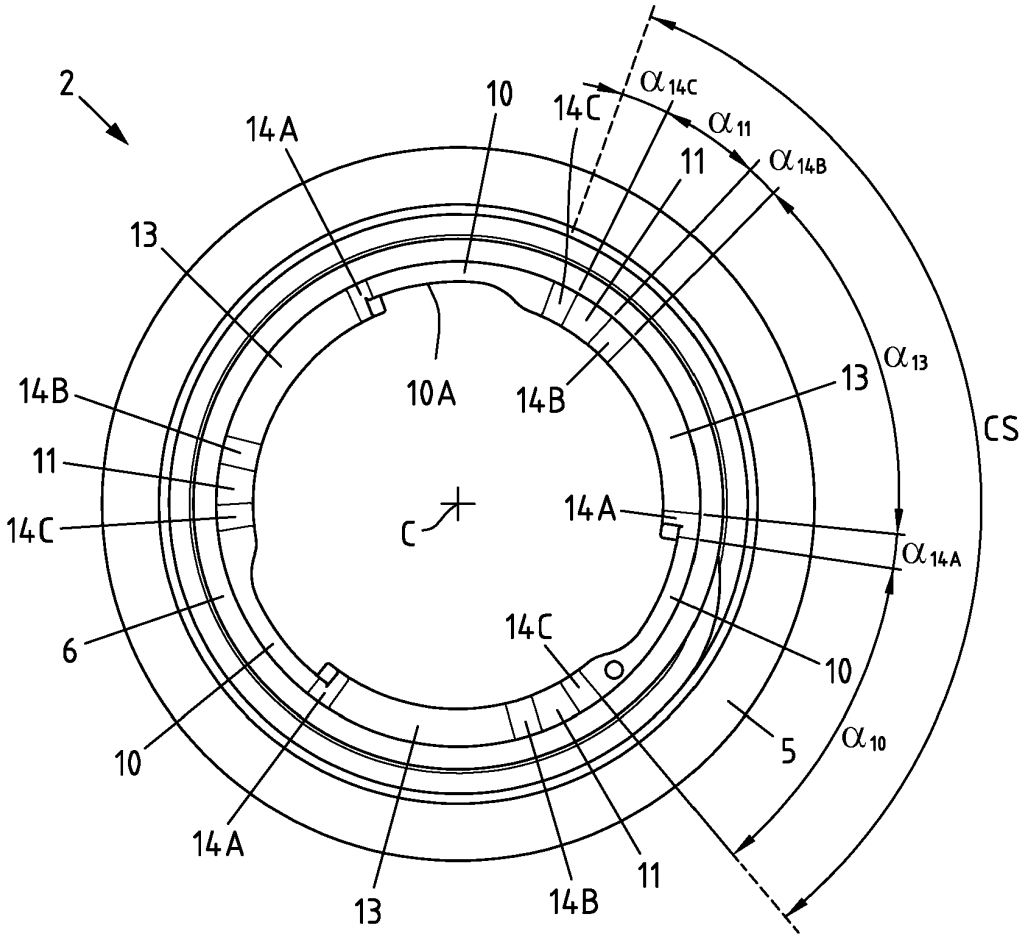
2
14A
10
14C
α14C
α11
11
α14B
13
α13
CS
14B
10A
14B
13
11
14C
C
14A
α14A
14C
6
10
5
α10
10
14A
13
14B
11

Fig.6

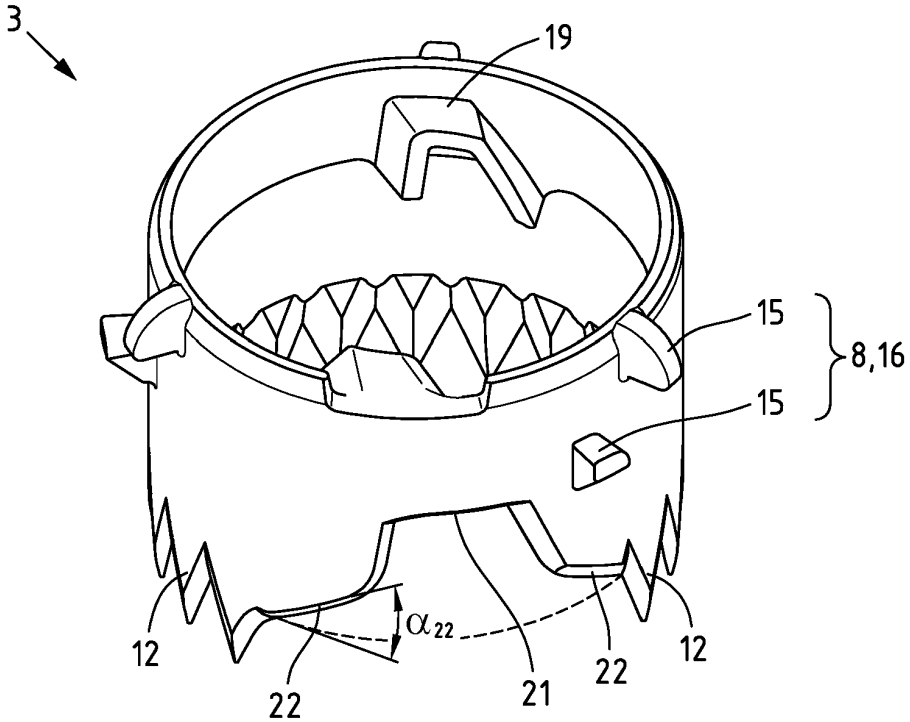
3
19
15
8,16
15
α22
12
22
21
22
12

Fig.7

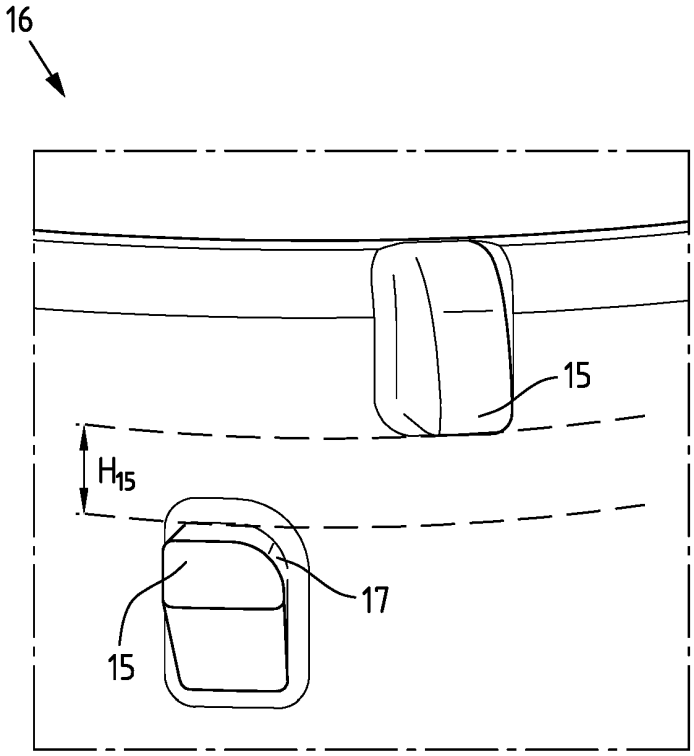

Fig.8

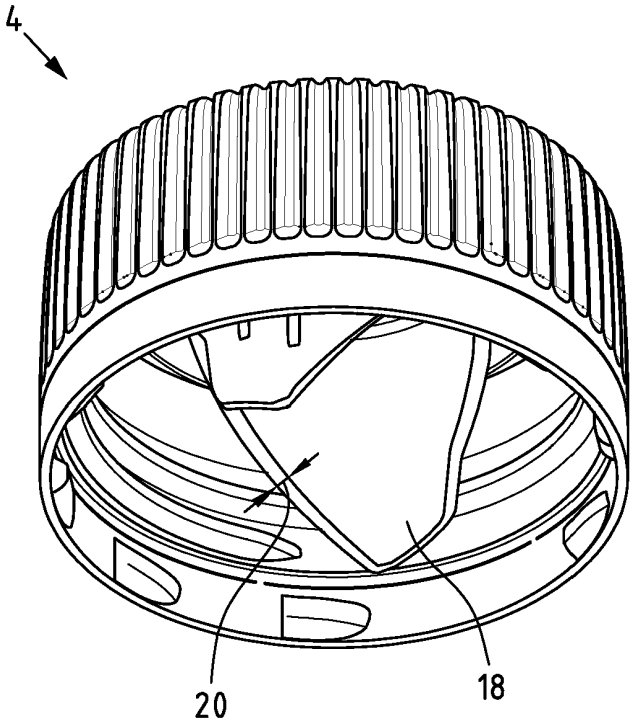

Fig.9

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 3464089 B1 **[0005]**
- EP 3464090 B1 **[0005]**