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DESCRIPTION

Description

[0001] The present invention relates to a packaging unit made of moulded pulp for products like eggs and similar products like kiwis and tomatoes, for example.

[0002] Egg cases, containers or cartons known in practice are generally fabricated from carton made from moulded pulp originating from paper material. Such units comprise a bottom part, provided with compartments for individual products, and a cover part that is often hingedly connected to the bottom part. Products like eggs are transported in these units and displayed on shelves in supermarkets, for example.

[0003] WO 2013/164664 and WO 2013/151431 disclose an egg package having a bottom part, a cover part and cam that extends through an opening in the cover part when the package is closed.

[0004] During the transport of the packaging units and the stacked display of packaging units, the lock that is provided to secure the cover part to the bottom part in the closed position of the packaging unit needs to be sufficiently stable. In practice, due to the forces acting on the packaging units, wear, and production tolerances etc. the lock is not always sufficiently stable, such that the cover part is not sufficiently locked to the bottom part in the closed position of the packaging unit. This may result in product damage and even product loss during transport and/or storage. At the same time the front surface of the packaging unit should be available to display information to consumers. A large lock may interfere with such display of information.

[0005] The present invention has for its object to obviate or at least reduce the above stated problems in known packaging units such as egg cases or egg cartons.

[0006] The present invention provides for this purpose a packaging unit according to claim 1.

[0007] Having a packaging unit with a bottom part and a cover part enables transport and display of products without damaging the products. This is especially relevant in case of vulnerable products like eggs. In a preferred embodiment, the cover part is hingedly connected to the bottom part on the rear side thereof. On the front side a lock is provided comprising a first locking element on the bottom part and an opening in the cover part.

[0008] The first locking element extends upwardly from the bottom part, thereby defining a cam structure with an at least partly downwardly facing locking plane having a length and a width. Preferably, the cam comprises a locking plane that extends outwardly downwards. Preferably, the first locking element is hingedly connected to the bottom part and capable of

some rotating movement. In case the cam is provided with a closed outer contour/surface without openings the plane corresponds to the at least partly downwardly facing locking surface of the cam.

[0009] When the packaging unit is in a closed position, the cam partly extends through an opening that is provided in the front surface of the cover part. This provides a lock capable of locking the packaging unit according to the invention to prevent unintentional opening of the packaging unit.

[0010] By providing the label of the cover part with a curved cut at or close to the location of the first locking element in a closed position of the packaging unit, the packaging unit can be locked securely, while maintaining the front view of the label substantially intact. This provides an effective display surface to provide consumers with relevant information about the products inside the packaging unit, for example.

[0011] In a presently preferred embodiment the curved cut is positioned relative to the cam such that in a closed position of the packaging unit the cam defines a buckling or deflected part in the label. This further enhances the display surface and provides an additional three-dimensional effect on the label. Preferably this three-dimensional effect is further enhanced by providing the cam with an egg-shape. This is particular useful in case of packing egg-products for a visual indication to consumers of the products inside the packaging unit. Furthermore, the egg-shaped cam distributes forces over the label in all relevant directions such that the risk of the label cracking or bursting when closing the packaging unit is significantly reduced.

[0012] In a presently preferred embodiment according to the present invention the curved cut comprises a circular shape with one curve radius.

[0013] Providing a single curve radius provides a cut that is well defined and is capable of distributing forces acting on the label in all relevant directions to prevent cracking or bursting of the label.

[0014] In a presently preferred embodiment according to the present invention the curved cut comprises more than one curve radius.

[0015] Providing more than one curve radius enables providing a cut with any desired length. This provides additional flexibility for the dimensions of the packaging unit.

[0016] In a presently preferred embodiment according to the present invention the curved cut comprises a cross-cut provided at least at one of the ends of the cut.

[0017] Providing a cross-cut, preferably at both ends of the cut in the label, prevents undesired extension of the cut or tearing of the label when forces act on the label. This is achieved by increasing the flexibility of the label to follow the contour of the cam in the closed position of the packaging unit.

[0018] In a presently preferred embodiment according to the present invention the packaging unit further comprises a second locking element in the front surface of the cover part defining at least partly the opening in the front surface of the cover part, wherein the second locking element at least partly extending inwardly from the front surface of the cover part over a length such that the first and the second locking elements define a lock for the packaging unit, wherein the ratio of the length of the cam and the length of the second locking element is in the range of 1.25 - 3.

[0019] To further enhance the locking function and increase the stability of the lock during transport and/or storage and/or display, the second locking element extends inwardly from the front surface of the cover part over a certain length. This further improves the locking function and more specifically improves the stability of the lock over a broad range of conditions involving forces acting on the packaging unit, wear, and production tolerances.

[0020] The second locking element is preferably shaped as a lip or edge that is preferably provided at or near the bottom edge of the opening in the front surface of the cover part. Preferably, the second locking element comes into contact with the at least partially downward facing locking plane of the first locking element when an upwards acting force is applied to the cover part, while it is not the intention to open the packaging unit.

[0021] Providing the second locking element over a certain length improves the stability of the lock. The ratio of the length of the cam and the length of the second locking element is in the range of 1.25-3 mm, preferably in the range of 1.5-2.5 mm, more preferably in the range of 1.6-2.2 mm, and most preferably the ratio is about 1.8 mm. By providing the second locking element with a length extending at least partly in the similar direction as the substantial downward facing plane of the cam over a substantial distance, an improved stability of the lock is achieved. This prevents product damage during transport, storage and display that may be caused by accidently opening the packaging unit and damaging the products inside, for example.

[0022] Preferably, the second locking element that is preferably shaped as a lip or edge, has a length of about 3.5-8 mm, more preferably, the length is about 5 mm. It is shown that providing a significant length, preferably 5 mm, for the second locking element contributes to guaranteeing a sufficient locking function when the packaging unit according to the present invention is used in practice with disturbing effects. This further improves the stability of the lock of the packaging unit, thereby reducing the risk of damaging products therein.

[0023] In a presently preferred embodiment according to the present invention, the plane of the first locking element is provided with an angle relative to the horizontal in the range of 3°-20°, preferably in the range of 5°-15°, and most preferably the angle is about 10°.

[0024] By providing the at least partly downward facing plane or surface of the first locking element in closed position of the packaging unit at an angle to the horizontal, a self-locking

effect is achieved. In this embodiment the second locking element is confronted with a locking force that has a component in an inward direction of the packaging unit. This further stabilises the lock of the packaging unit.

[0025] Preferably, the second locking element is provided at an angle relative to the front surface of the cover part in the range of 20°-60°, preferably in the range of 30°-50°, and most preferably the angle is about 40°. This angle is relative to the front surface of the cover part. In a presently preferred embodiment according to the invention the first and second locking elements are arranged such that an increasing contact surface between the locking elements is achieved when an upwards directed force acts on the cover part in case of unintentional opening of the packaging unit. As an effect of such force the second locking element bends relative to the front surface of the cover part. Increasing the contact surface increases the strength of the locking function, thereby improving the stability of the lock.

[0026] In a presently preferred embodiment, both the first and the second locking elements are provided at their respective angles, and the combination of these two features further improves the stability of the lock beyond the sum of the individual effects.

[0027] In a presently preferred embodiment according to the present invention, the front surface of the cover part comprises two parts that are provided substantially above each other in vertical direction at an angle relative to each other, with a first lower part and a second part above the first part, with the second part comprising the one or more openings in the front surface.

[0028] By providing parts of the front surface of the cover part of an angle to each other a visual effect is achieved, such that a consumer has a good view on the (stack of) packaging units irrespective of the position of the consumer relative to the packaging unit. Furthermore, by having a first lower part of the front surface extending in a substantial vertical direction and providing a second part above the first part with the second part comprising the opening that is provided in the front surface, the lock capability of handling forces acting under various angles on the packaging unit is improved. Preferably a slightly inwardly inclined second part of the front surface is provided such that the contribution of the front surface of the cover part to the correct functioning of the lock is improved. This effect is even further improved in combination with providing the second locking element at an angle, as mentioned before, such that especially the self-locking and/or stability effect of the locking function is enhanced.

[0029] In a further presently preferred embodiment according the present invention, the first locking element is provided with a front surface comprising an embossing.

[0030] By providing an embossing at the front surface of the first locking element that in a closed position of the packaging unit at least partly extends through the opening in the front surface of the cover part, the consumer can be provided with visual information about the egg. This visual information may relate to the contents of the packaging unit and/or indication of a location for opening the packaging unit.

[0031] In a further preferred embodiment according to the present invention the cut enables the first locking element to partly extend through the cut in the label that is provided on the front surface of the cover part.

[0032] By providing the label with a cut, incision or slit, that defines an opening in the label, the first locking element is capable of extending through the opening in the front surface of the label.

[0033] Alternatively, a groove-shaped cut, incision or slit is provided that enables the first locking element to slightly deform the label. As an optional advantageous effect, the consumer is provided with information that the lock is correctly achieved. Furthermore, this provides the consumer with a visual indication of where, and how, to open the packaging unit.

[0034] In a presently preferred embodiment, the first locking element is formed by moulding and/or pressing and is provided with a closed surface or closed outer contour.

[0035] By designing the first locking element as a cam that is preferably provided with a nose shape, the first locking element can be formed during the manufacturing process involving moulding and/or pressing. This also enables providing the cam shaped first locking element with a closed surface or closed outer contour, i.e. substantially without openings in the contact surfaces of the lock.. This improves the contact between the downward facing plane/surface of the first locking element and the second locking element.

[0036] The present invention further relates to a method for packing products like eggs, comprising the steps of providing a packaging unit as described above, and placing therein one or more of the products.

[0037] Such method provides the same effect and advantages as described with respect of the packaging unit. In fact, the method can be used with a large number of different embodiments of the packaging units according to the invention.

[0038] Further advantages, features and details of the invention are elucidated on a basis of preferred embodiments thereof, wherein reference is made to the accompanying drawings, in which:

- Fig. 1 shows an embodiment of the packaging unit in an open position in a twin pack configuration;
- Fig. 2 shows a front view of the packaging unit of Figure 1 with two different embodiments in the twin pack configuration;
- Fig. 3 shows an alternative embodiment of the packaging unit according to the invention with two different embodiments in the twin pack configuration;
- Fig. 4 shows a cross-section of the packaging unit of Figures 1-2; and
- Fig. 5 shows a detail of the lock of Figure 4.

[0039] A packaging unit 2 (Figure 1) comprises a first unit 2a and a second unit 2b. Each unit comprises a bottom part 4 with a front surface 6, two side surfaces 8, a back side 10, and a bottom side 12. In the illustrated embodiment, a cover part 14 is hingedly connected with hinge 16 to bottom part 4 to allow cover part 14 to move relatively to bottom part 4 between an open and a closed position. Cover part 14 further comprises front surface 18, two side surfaces 20, a back side surface 22 and a top surface 24.

[0040] On the inside of bottom part 4 product receiving compartments 26 are provided having contours matching at least partially the outer contours of the products, like eggs, kiwis and tomatoes, for example. Support cones 28 are provided to add stability and strength to packaging unit 2. Lock 30 comprises opening 29 in cover part 14 and cam 31 of bottom part 4.

[0041] In the illustrated embodiment, connection 32 connects the twin packages 2A, 2B. It will be understood that all features shown for the twin pack configuration 2 can also be used in other configurations, including more conventional packaging units including a unit comprising 6, 10, 12 or any other number of compartments for receiving products like eggs.

[0042] Packaging unit 2 (Figure 2) is illustrated in a twin pack-configuration. For illustrative purposes alternative units 34, 40 are shown in one twin pack 2. Unit 34 is provided with label 36, wherein label 36 comprises cut 38. Cam 31 of lock 30 may extend through cut 38 and/or push part of label 36 slightly forward in area 40 when packaging unit 34 is in a closed position. In the illustrated embodiment area 40 will typically have an egg-shape corresponding with the shape of cam 31. In the illustrated embodiment cut 38 comprises a single radius R1, extending in height over distance y1 and in width direction over distance d1. It will be understood that several shapes of cut 38 can be applied. Unit 42 is provided with label 44 comprising alternative cut 46 with at least two different radii R2a and R2b, extending over distances y2 and d2 defining area 47.

[0043] A further alternative embodiment for packaging unit 48 comprises label 50, wherein cut 52 is provided (Figure 3) that extends over distances y3 and d3. Cut 52 is on both ends provided with cross-cuts 54. Cross-cuts 54 enlarge area 56 by increasing distance y3 enabling further buckling or deflection of label 50 caused by cam 31. Unit 58 comprises label 60 with cut 62 having at least two radii R4a and R4b, and cross-cuts 64. Distances y4 and d4 define area 66. For illustrative purposes alternative units 48, 58 are shown in one twin pack.

[0044] Lock 30 (Figures 4-5) comprise a nose-shaped cam 31 acting as first locking element. Cam 31 is provided on flap 150 that is hingedly connected by connection 152 to bottom part 4 of packaging unit 2. In the illustrated embodiment, connection 152 is capable of a slightly rotating movement A. In the illustrated embodiment, cam 31 defines a closed outer surface or outer contour defining a chamber 154. The substantially downward facing surface 156 of cam 31 is in the illustrated embodiment a substantially closed surface without openings. In the closed position of packaging unit 2, cam 31 partly extends through opening 29 that is provided

in the front surface 18 of cover part 14. The upper edge 160 of opening 29 is provided at a small angle and is slightly pushed inwards.

[0045] Front surface 18 of cover part 14 is provided with lower part 162 that in the closed position of packaging unit 2 extends substantially vertical. In the illustrated embodiment, a second part 164 is provided directly above first part 162 at an inwards inclined angle β relative to vertical 170. The upper edge of second part 164 defines the lower edge 166 of opening 29 and acts as second locking element. Edge or lip 166 of this second locking element extends over a distance D1 and is provided at an angle α relative to the second part 164 of front surface 18. Furthermore, in the illustrated embodiment, surface 156 of cam 31 is provided at an angle γ relative to horizontal 168. Surface 156 extends substantially inward over a length D2. In the illustrated embodiment, length D2 is about two times the length D1 of lip 166. In the illustrated embodiment α is about 30°, β is about 5° and γ is about 12°. Distance D1 is about 5 mm and distance D2 is about 9 to 10 mm. It will be understood that other configurations and dimensions will also be possible in accordance with the present invention.

[0046] It will be understood that in a presently preferred embodiment, lip 166 is provided at a somewhat larger angle relative to horizontal 168 as compared to surface 156. When unintentionally lifting cover part 14, lip 166 will contact surface 156 and the contact surface between the two locking elements 31, 166 will increase with an increasing upwards directed force. This improves the stability of lock 30.

[0047] When packing products like eggs, the products are placed in compartments 28. In the illustrated embodiment, when cover part 14 is closed lock 30 with locking elements 31, 166 locks packaging unit 2a, 2b. In the illustrated embodiment, in such closed position cam 31 partly extends and protrudes through opening 29 of front surface 18 of cover part 14. When opening packaging unit 2a, 2b cam 31 is slightly pushed inwards, such that lip 166 can move upwardly. The length D1 of lip 166 relative to the length D2 of surface 156 provides a stable lock 30 in case of forces applying in an upward direction on cover 18 when it is not the intention to open packaging unit 2a, 2b.

[0048] When manufacturing packaging unit 2a, 2b, in the illustrated embodiment, a chamber 154 is provided by moulding and/or pressing such that plane 156 preferably provides a closed surface. It will be understood that other alternative configurations are also possible in accordance with the invention.

[0049] The present invention is by no means limited by the above described preferred embodiments thereof. The rights sought are defined by the following claims within the scope of which many modifications can be envisaged.

REFERENCES CITED IN THE DESCRIPTION

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PATENTKRAV

1. Pakkeenhed (2, 48), som er fremstillet af støbt pulp og beregnet til produkter, såsom æg, hvilken pakkeenhed omfatter:

- en bunddel (4), som er forsynet med rum (26) til de enkelte produkter;
- en lågdel (14), som omfatter en øvre flade (24), en forflade (18) og en bagflade (22), hvor forfladen har en eller flere åbninger (29);
- et første låseorgan, som strækker sig op fra bunddelen og fastlægger en kamdel (31) med et i det mindste delvis nedad vendende låseplan (156), der har en længde og bredde, hvorved låseplanet strækker sig udad og nedad, så at længden af kamdelen delvis kan strække sig gennem en åbning (29) i forfladen af lågdelen, når pakkeenheden befinder sig i lukket stilling; og
- en etiket (36, 44, 50), som er anbragt på lågdelen,

kendetegnet ved, at lågdelen har et buet snit (38, 46, 52), som er således udformet, at kamdelen delvis kan rage igennem åbningen i lågdelen og forblive i hovedsagen bag ved etiketten, når pakkeenheden ses forfra og i lukket tilstand.

2. Pakkeenhed ifølge krav 1, hvor det buede snit er således anbragt i forhold til kamdelen, at det i en lukket tilstand af pakkeenheden gælder, at kamdelen (31) fastlægger en udbuling eller udbøjet del i etiketten.

3. Pakkeenhed ifølge krav 1 eller 2, hvor kamdelen har en ægform.

4. Pakkeenhed ifølge krav 1, 2 eller 3, hvor det buede snit (38) har en cirkulær form med én krumningsradius (R1), eller hvor det buede snit (46) har mere end én krumningsradius (R2a, R2b).

5. Pakkeenhed ifølge eller flere af de foregående krav, hvor det buede snit (52) omfatter et tværgående snit (54), som er tilvejebragt i det mindste ved en af enderne af snittet.

6. Pakkeenhed ifølge et eller flere af de foregående krav, og som yderligere omfatter et andet låseorgan (166) i forfladen (18) på lågdelen (14), som i det mindste delvis fastlægger åbningen (29) i lågdelens forflade, og hvor det andet låseorgan i det mindste delvis strækker sig indad fra lågdelens (14) forflade (18) – og dette over en længde (D1) på en sådan måde, at det første og andet låseorgan fastlægger en lås (30) i pakkeenheden, og hvor forholdet mellem længden (D2) af kamdelen (31) og længden (D1) af det andet låseorgan ligger i området 1,25 – 3, mere foretrukket i området 1,6-2,2, og særligt foretrukket er ca. 1,8.

7. Pakkeenhed ifølge krav 6, hvor det andet låseorgan (166) har en længde (D1) på ca. 3,5-8 mm, fortrinsvis ca. 5 mm.

8. Pakkeenhed ifølge et eller flere af de foregående krav, hvor det i hovedsagen i nedadgående retning orienterede plan (156) i det første låseorgan (31) danner en vinkel (γ) med vandret retning (168) i området 3°-20°, fortrinsvis i området 5°-15°, og særligt foretrukket er ca. 10°.

9. Pakkeenhed ifølge krav 6 eller 7, eller 8, når kravet er afhængigt af krav 6 eller 7, og hvor det andet låseorgan (166) danner en vinkel (α) med forfladen (18) på lågdelen (14), hvilken vinkel ligger i området 20°-60°, fortrinsvis i området 30°-50°, og mest foretrukket er ca. 40°.

10. Pakkeenhed ifølge krav 6, 7 eller 9, eller 8, når kravet er afhængigt af krav 6 eller 7, og hvor det første og andet låseorgan er således indrettet, at en berøringsflade mellem det første og andet låseorgan øges, når der påføres en forøget opadrettet kraft på lågdelen uden, at pakkeenheden åbnes.

11. Pakkeenhed ifølge et eller flere af de foregående krav, hvor lågdelens forflade omfatter to dele, som set i lodret retning er tilvejebragt i hovedsagen oven over hinanden, men danner en vinkel (β) med hinanden.

12. Pakkeenhed ifølge et eller flere af de foregående krav, hvor det første låseorgan har en forflade, som omfatter et ophøjet præg.

13. Pakkeenhed ifølge et eller flere af de foregående krav, hvor snittet gør det muligt, at det første låseorgan delvis kan strække sig herigennem.

14. Pakkeenhed ifølge et eller flere af de foregående krav, hvor det første låseorgan er dannet ved støbning og/eller presning og er forsynet med en lukket yderflade.

15. Fremgangsmåde til pakning af produkter, såsom æg, og som omfatter det trin, at der tilvejebringes en pakkeenhed (2, 4, 8) ifølge et eller flere af kravene 1-14, og at der anbringes et eller flere produkter i pakkeenheden.

DRAWINGS

Drawing

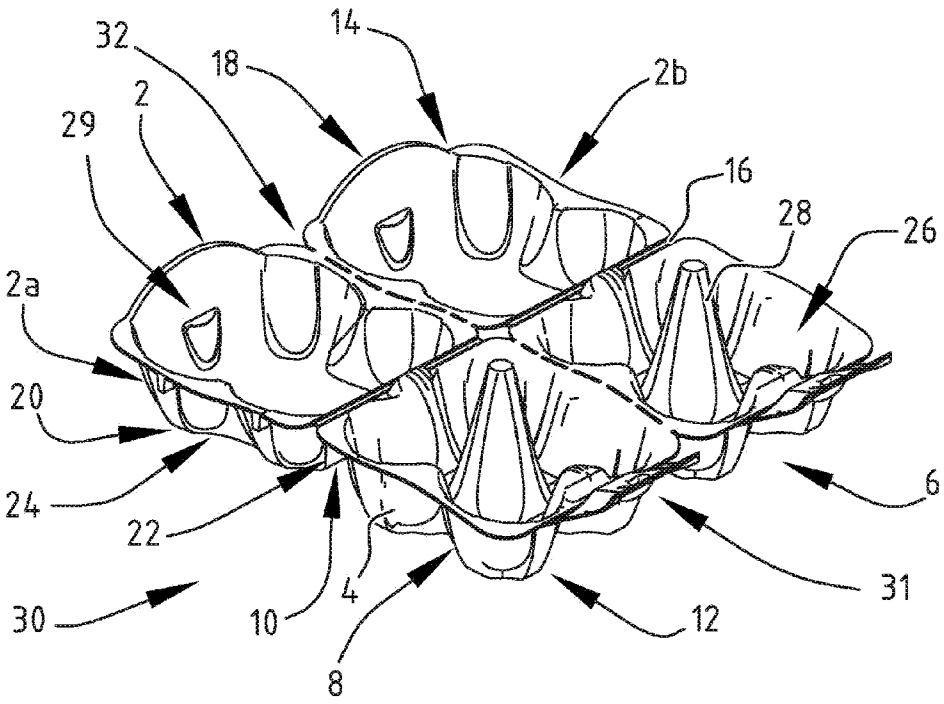

FIG. 1

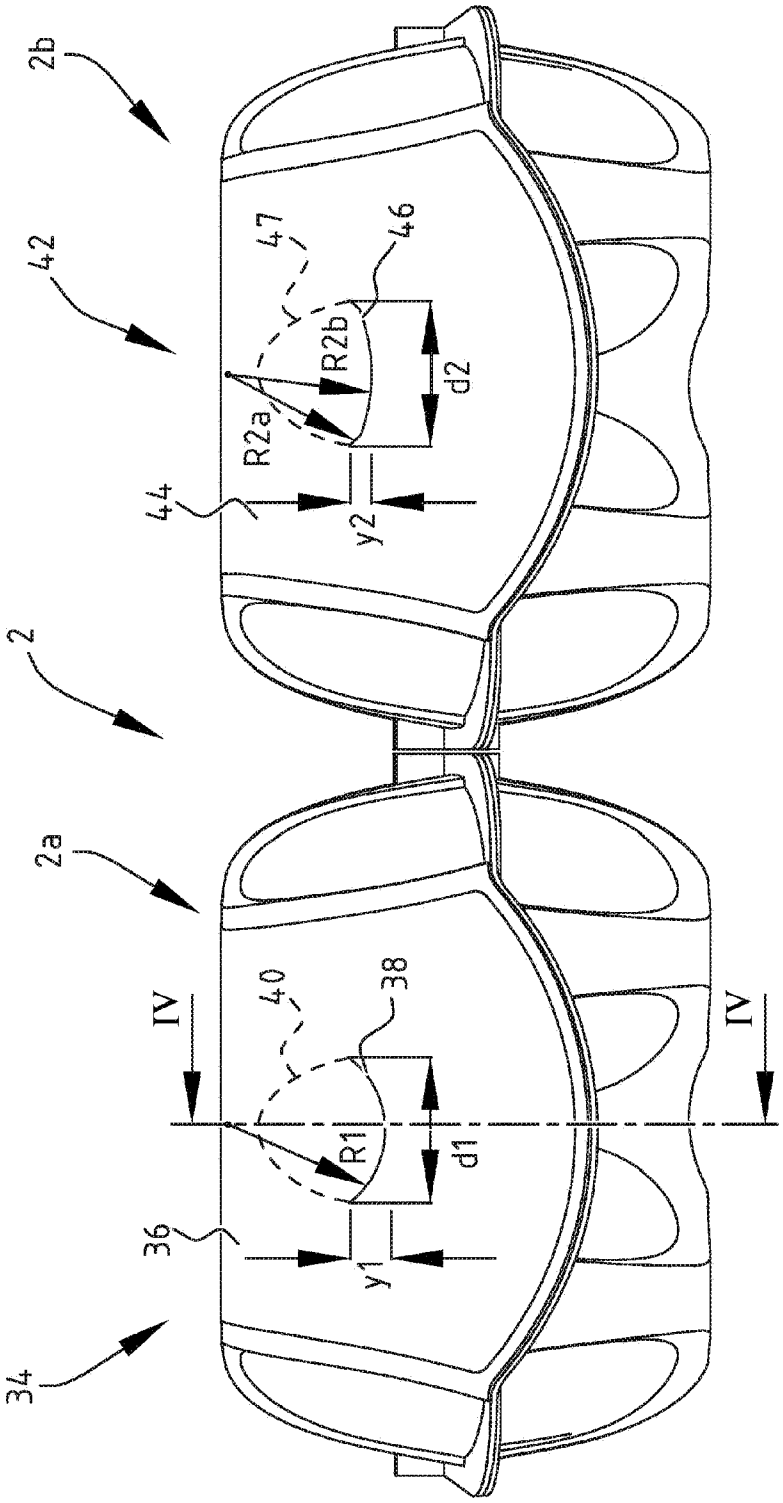

FIG. 2

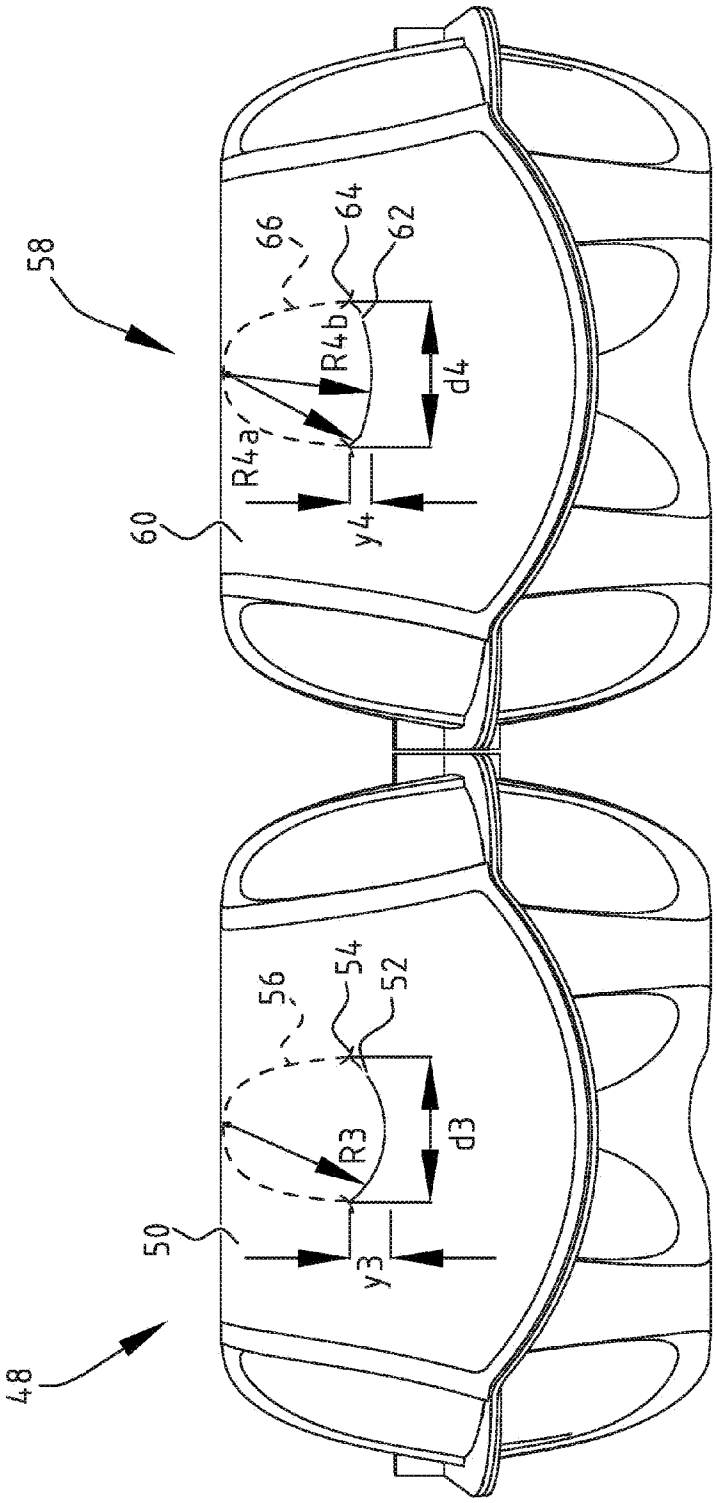

FIG. 3

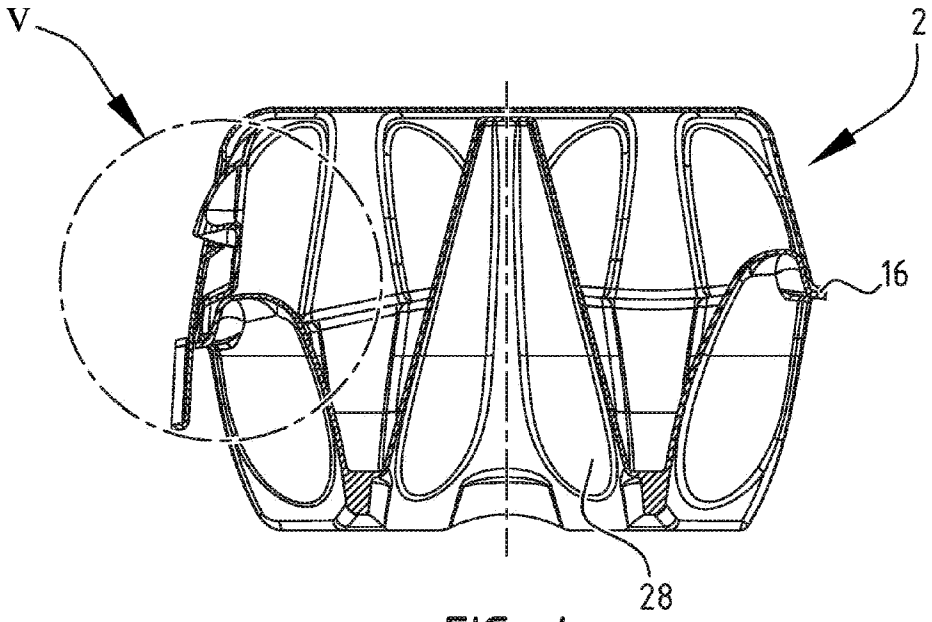

FIG. 4

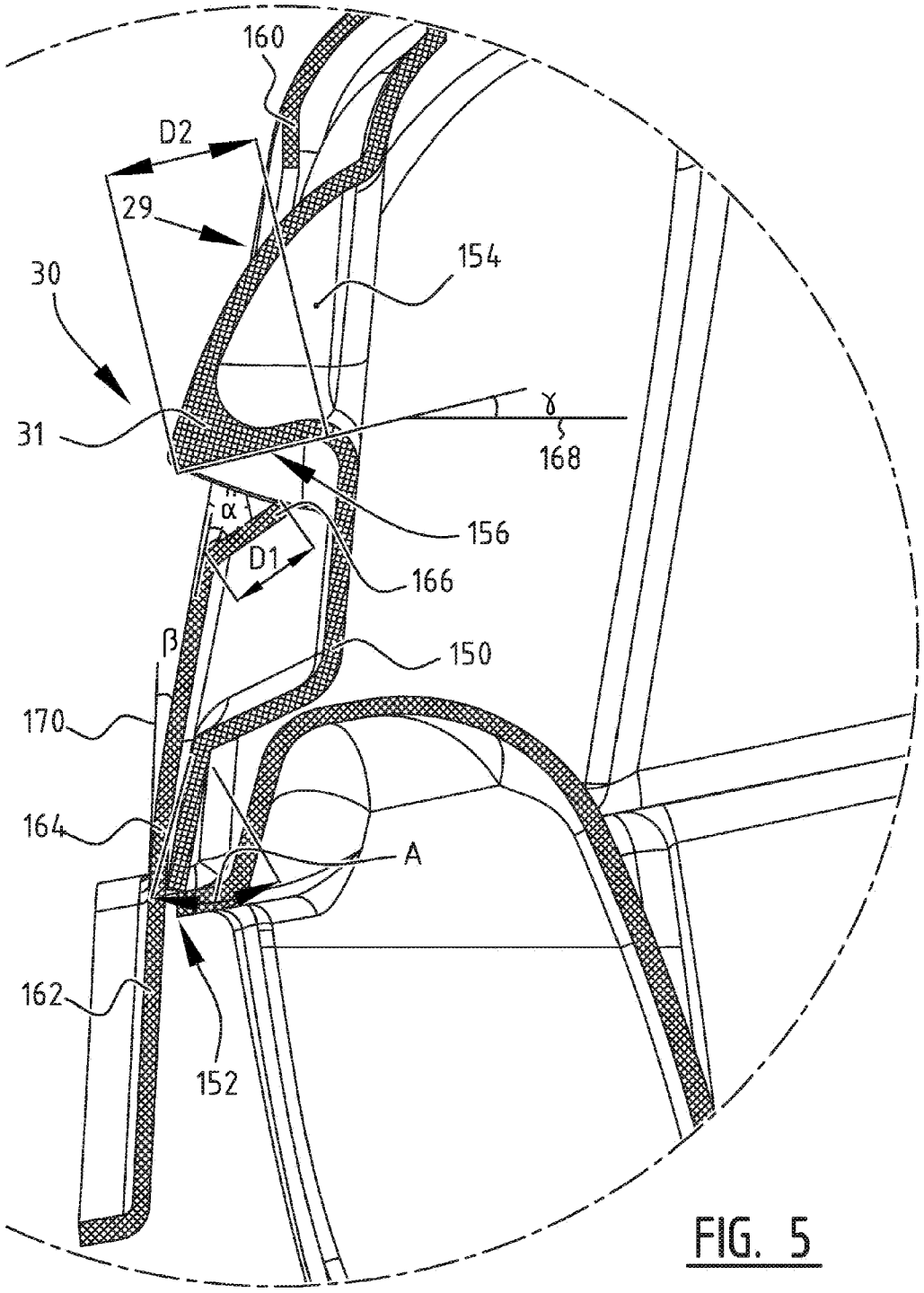

FIG. 5