



HU000034419T2

(19) **HU**(11) Lajstromszám: **E 034 419**(13) **T2****MAGYARORSZÁG****Szellemi Tulajdon Nemzeti Hivatala**

EURÓPAI SZABADALOM SZÖVEGÉNEK FORDÍTÁSA

(21) Magyar ügyszám: **E 15 726373**(22) A bejelentés napja: **2015. 04. 14.**(51) Int. Cl.: **B65D 85/32** (2006.01)

(96) Az európai bejelentés bejelentési száma:

EP 20150726373

(86) A nemzetközi (PCT) bejelentési szám:

PCT/NL 15/050245

(97) Az európai bejelentés közzétételi adatai:

EP 3119699 A1 **2015. 10. 22.**

(87) A nemzetközi közzétételi szám:

WO 15160248

(97) Az európai szabadalom megadásának meghirdetési adatai:

EP 3119699 B1 **2017. 06. 07.**

(30) Elsőbbségi adatok:

2012623	2014. 04. 15.	NL
2013011	2014. 06. 17.	NL

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Csomagolóegység zárral és eljárás termékek csomagolására

Az európai szabadalom ellen, megadásának az Európai Szabadalmi Közlönyben való meghirdetésétől számított kilenc hónapon belül, felszólalást lehet benyújtani az Európai Szabadalmi Hivatalnál. (Európai Szabadalmi Egyezmény 99. cikk(1))

A fordítást a szabadalmas az 1995. évi XXXIII. törvény 84/H. §-a szerint nyújtotta be. A fordítás tartalmi helyességét a Szellemi Tulajdon Nemzeti Hivatala nem vizsgálta.

(19)



(11)

EP 3 119 699 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:

07.06.2017 Bulletin 2017/23

(51) Int Cl.:

B65D 85/32 (2006.01)

(86) International application number:

PCT/NL2015/050245

(21) Application number: **15726373.2**

(22) Date of filing: **14.04.2015**

(87) International publication number:

WO 2015/160248 (22.10.2015 Gazette 2015/42)

(54) **PACKAGING UNIT WITH LOCK AND METHOD FOR PACKING PRODUCTS**

VERPACKUNGSEINHEIT MIT SCHLOSS UND VERFAHREN ZUM VERPACKEN VON PRODUKTEN

UNITÉ DE CONDITIONNEMENT COMPRENANT UN SYSTÈME DE VERROUILLAGE ET PROCÉDÉ
DE CONDITIONNEMENT DE PRODUITS

(84) Designated Contracting States:

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

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(30) Priority: **15.04.2014 NL 2012623**

17.06.2014 NL 2013011

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(43) Date of publication of application:

25.01.2017 Bulletin 2017/04

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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] DE 20 2013 011 737 U1, which discloses a packaging unit according to the preamble of claim 1, and NL 7810282 disclose packaging units for eggs having a bottom part provided with compartments, and a cover part.

[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.

[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 a second locking element on 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 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] 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, having a length and a width, 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.

[0011] 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. The first and second locking elements are configured such that the locking elements are capable of engaging each other over the length of the locking element, more specifically the second locking element is configured such that it is capable of engaging, with its length, the first locking element in a locking state of the packaging unit. This enables an increase in the effective locking area, i.e. the surface of the first and second locking elements that may contact each other, thereby improving locking security. 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. This improves the locking function and stability of the packaging unit.

[0012] 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 accidentally opening the packaging unit and damaging the products inside, for example.

[0013] 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.

[0014] 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°.

[0015] 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.

[0016] 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.

[0017] 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.

[0018] 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 comprising the one or more openings in the front surface.

[0019] By providing parts of the front surface of the cover part at 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.

[0020] In a further presently preferred embodiment according to the present invention, the first locking element is provided with a front surface comprising an embossing.

[0021] 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.

[0022] In a further preferred embodiment according to the present invention, the packaging unit comprises a label that is provided on the cover part, wherein the label comprises a cut to enable the first locking element to partly extend through the opening in the front surface of the cover part.

[0023] By providing the label with a cut, incision or slit, the first locking element is capable of extending through the opening in the front surface. The cut can be shaped as an opening such that the first locking element extends through the opening in the front surface of the cover part and the label that is provided thereon. 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.

[0024] In a presently preferred embodiment the cut comprises a curved cut that is configured to enable the cam to partly extend through the opening in the cover part. More specifically, the curved cut is preferably 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 and keeping the cam substantially behind the label as seen in a front view of the packaging unit in a closed position thereof. 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 particularly 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. In one of the presently preferred embodiments according to the present invention the curved cut comprises a circular shape with one curve radius. 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. In an alternative preferred embodiment according to the present invention the curved cut comprises more than one curve radius. 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.

[0025] 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.

[0026] 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.

[0027] 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.

[0028] 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.

[0029] 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;
- Fig. 2 shows a front view of the packaging unit of Figure 1;
- Fig. 3A and B show a combination of two different embodiments in the twin pack unit;
- Fig. 3C shows a front view of the packaging unit of Figure 1 in an alternative embodiment with two different embodiments in the twin pack configuration;
- Fig. 3D shows a further 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.

[0030] A packaging unit 2 (Figures 1-2) 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.

[0031] 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.

[0032] 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.

[0033] Several alternative embodiments of a packaging unit can be envisaged (Figure 3A and B), including a packaging unit 34 that is provided with a label 36 wherein label 36 comprises cut 38. Lock 30 may extend through cut 38 and/or push part of label 36 slightly forward when packaging unit 34 is in a closed position. It will be understood that several shapes of cut 38 can be applied, including the groove-shaped cut in a substantially horizontal direction as illustrated in Figure 3A, as well as U-shaped cuts that enable part of label 36 to slightly be pushed upwards by lock 30 when packaging unit 34 is in a closed position.

[0034] A further alternative embodiment for packaging unit 40 comprises label 42 wherein an opening 44 (Figure 3A) is provided. For illustrative purposes alternative units 34, 40 are shown in one twin pack. In alternative unit 40 front surface of lock 30 is provided with an embossment 46. The shape of embossment 46 can be related to the product provided inside packaging unit 40, such as an egg-shape, or provide further information to the consumer, such as where to open packaging unit 40. Alternative embodiments 134, 140 (Figure 3 B) with lock 130 comprise labels 136, 142 with a $\perp$ -shaped cut 138 and a $+$ -shaped cut 138, respectively. It will be understood that other shapes are also possible including U-, V-, Δ -, and $\diamond$ -shaped cuts. In the illustrated embodiments cut 138 is embodied as an incision. Alternatively, cut 138 can be provided as a cut-away with some label material being removed.

[0035] Alternative packaging unit 202 (Figure 3 C) is illustrated in a twin pack-configuration. For illustrative purposes alternative units 234, 240 are shown in one twin pack 202. Unit 234 is provided with label 236, wherein label 236 comprises cut 238. Cam 231 of lock 230 may extend through cut 238 and/or push part of label 236 slightly forward in area 240 when packaging unit 234 is in a closed position. In the illustrated embodiment area 40 will typically have an egg-shape corresponding with the shape of cam 231. In the illustrated embodiment cut 238 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 238 can be applied. Unit 242 is provided with label 244 comprising alternative cut 246 with at least two different radii R2a and R2b, extending over distances y2 and d2 defining area 247.

[0036] A further alternative embodiment for packaging unit 248 comprises label 250, wherein cut 252 is provided (Figure 3 D) that extends over distances y3 and d3. Cut 252 is on both ends provided with cross-cuts 254. Cross-cuts 254 enlarge area 256 by increasing distance y3 enabling further buckling or deflection of label 250 caused

by cam 231. Unit 258 comprises label 260 with cut 262 having at least two radii R4a and R4b, and cross-cuts 264. Distances y4 and d4 define area 266. For illustrative purposes alternative units 248, 258 are shown in one twin pack.

[0037] Lock 30 (Figures 4-5) comprise a nose-shaped cam 48 acting as first locking element. Cam 48 is provided on flap 50 that is hingedly connected by connection 52 to bottom part 4 of packaging unit 2. In the illustrated embodiment, connection 52 is capable of a slightly rotating movement A. In the illustrated embodiment, cam 48 defines a closed outer surface or outer contour defining a chamber 54. The substantially downward facing surface 56 of cam 48 is in the illustrated embodiment a substantially closed surface without openings. In the closed position of packaging unit 2, cam 48 partly extends through opening 58 that is provided in the front surface 18 of cover part 14. The upper edge 60 of opening 58 is provided at a small angle and is slightly pushed inwards.

[0038] Front surface 18 of cover part 18 is provided with lower part 62 that in the closed position of packaging unit 2 extends substantially vertical. In the illustrated embodiment, a second part 64 is provided directly above first part 62 at an inwards inclined angle β relative to vertical 70. The upper edge of second part 64 defines the lower edge 66 of opening 58 and acts as second locking element. Edge or lip 66 of this second locking element extends over a distance D1 and is provided at an angle α relative to the second part 64 of front surface 18. Furthermore, in the illustrated embodiment, surface 56 of cam 48 is provided at an angle γ relative to horizontal 68. Surface 56 extends substantially inward over a length D2. In the illustrated embodiment, length D2 is about two times the length D1 of lip 66. 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.

[0039] It will be understood that in a presently preferred embodiment, lip 66 is provided at a somewhat larger angle relative to horizontal 68 as compared to surface 56. When unintentionally lifting cover part 14, lip 66 will contact surface 56 and the contact surface between the two locking elements 48, 66 will increase with an increasing upwards directed force. This improves the stability of lock 30.

[0040] 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 48, 66 locks packaging unit 2a, 2b. In the illustrated embodiment, in such closed position cam 48 partly extends and protrudes through opening 58 of front surface 18 of cover part 14. When opening packaging unit 2a, 2b cam 48 is slightly pushed inwards, such that lip 66 can move upwardly. The length D1 of lip 66 relative to the length D2 of surface 56 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.

[0041] When manufacturing packaging unit 2a, 2b, in the illustrated embodiment, a chamber 54 is provided by moulding and/or pressing such that plane 56 preferably provides a closed surface. It will be understood that other alternative configurations are also possible in accordance with the invention.

[0042] 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.

Claims

1. Packaging unit (2, 34, 40, 202, 248) made of moulded pulp for products like eggs, comprising:

- a bottom part (4) provided with compartments (28) for individual products;
- a cover part (14) comprising top, front (18) and rear surfaces with the front surface comprising one or more openings (58);
- a first locking element extending upwardly from the bottom part defining a cam (48) that when the packaging unit is in a closed position partly extends through one of the one or more openings, the cam having an at least partly downwardly facing locking surface (56), the surface having a length (D2) and a width, such that the length of the cam partly extends through the opening in the front surface of the cover part in a closed position of the packaging unit; and
- a second locking element shaped as a lip or edge (66) having a length (D1) and a width, at least partly extending inwardly from the front surface of the cover part over the length such that the first and the second locking elements define a lock (30) for the packaging unit, wherein second locking element is capable of engaging the first locking element, with its length, in a locking state of the packaging unit, **characterized in that** the ratio of the length of the cam and the length of the second locking element is in the range of 1.25 - 3.

2. Packaging unit according to claim 1, wherein the ratio is in the range of 1.5-2.5, preferably in the range of 1.6-2.2, and most preferably is about 1.8.

3. Packaging unit according to claim 1 or 2, wherein the second locking element has a length of about 3.5-8 mm, preferably about 5 mm.

4. Packaging unit according to claim 1, 2 or 3, wherein the substantially downwardly oriented plane of the

first locking element is provided at an angle (γ) relative to the horizontal (68) in the range of 3°-20°, preferably in the range of 5°-15°, and most preferably is about 10°.

5. Packaging unit according to one or more of the foregoing claims, wherein the second locking element is provided at an angle (α) relative to the front surface (18) of the cover part in the range of 20°-60°, preferably in the range of 30°-50°, and most preferably is about 40°. 5
6. Packaging unit according to claim 5, wherein the first and second locking elements are arranged such that a contact surface between the first and second locking elements increases when applying an increasing upwardly directed force on the cover part without opening the packaging unit. 10
7. Packaging unit according to one or more of the foregoing claims, wherein the front surface (18) of the cover part comprises two parts (62, 64) that are provided substantially above each other in vertical direction at an angle relative to each other, with a first lower part (62) and a second part (64) above the first part comprising the one or more openings in the front surface. 15
8. Packaging unit according to one or more of the foregoing claims, wherein the first locking element having a front surface comprising an embossing (46). 20
9. Packaging unit according to one or more of the foregoing claims, further comprising a label (36, 42, 136, 142, 236, 244, 250, 260) that is provided on the cover part, wherein the label comprises a cut (38, 138, 238, 246, 252, 262) to enable the first locking element to partly extend through the opening. 25
10. Packaging unit according to claim 9, wherein the cut comprises a curved cut (238, 246, 252, 262) that is configured to enable the cam to partly extend through the opening in the cover part. 30
11. Packaging unit according to one or more of the foregoing claims, wherein the first locking element is formed by moulding and/or pressing and is provided with a closed outer surface. 35
12. Method for packing products like eggs, comprising the step of providing a packaging unit (2, 34, 40, 202, 248) according to one or more of the claims 1-11, and placing therein one or more of the products. 40

Patentansprüche

1. Verpackungseinheit (2, 34, 40, 202, 248), die aus

geformter Pulpe für Produkte, wie Eier hergestellt ist, umfassend:

- ein Unterteil (44), das mit Fächern (28) für einzelne Produkte versehen ist,
- ein Abdeckteil (14), umfassend obere, vordere (18) und hintere Flächen, wobei die vordere Fläche eine oder mehrere Öffnungen (58) enthält,
- ein erstes Verriegelungselement, welches sich von dem Unterteil unter Festlegung eines Nockens (48) nach oben erstreckt, der sich in dem Fall, dass die Verpackungseinheit sich in einer geschlossenen Stellung befindet, teilweise durch eine der einen oder mehreren Öffnungen erstreckt, wobei der Nocken eine zumindest teilweise nach unten weisende Verriegelungsfläche (56) aufweist, die eine solche Länge (D2) und Breite aufweist, dass sich die Länge des Nockens in einer geschlossenen Stellung der Verpackungseinheit teilweise durch die Öffnung in der vorderen Fläche des Abdeckteiles erstreckt,
- und ein zweites Verriegelungselement, welches als Lippe oder Rand (66) mit einer Länge (D1) und einer Breite geformt ist, sich zumindest teilweise von der vorderen Fläche des Abdeckteiles über die Länge nach innen erstreckt, derart, dass die ersten und zweiten Verriegelungselemente einen Verschluss (30) für die Verpackungseinheit festlegen, wobei das zweite Verriegelungselement in einem Verriegelungszustand der Verpackungseinheit imstande ist, in das erste Verriegelungselement mit seiner Länge einzugreifen,

dadurch gekennzeichnet, dass das Verhältnis der Länge des Nockens und der Länge des zweiten Verriegelungselements im Bereich von 1,25-3 liegt.

2. Verpackungseinheit nach Anspruch 1, wobei das Verhältnis im Bereich von 1,5-2,5, vorzugsweise im Bereich von 1,6-2,2 und am bevorzugten bei etwa 1,8 liegt. 45
3. Verpackungseinheit nach Anspruch 1 oder 2, wobei das zweite Verriegelungselement eine Länge von etwa 3,5-8mm, vorzugsweise von etwa 5mm aufweist. 50
4. Verpackungseinheit nach Anspruch 1, 2 oder 3, wobei die im Wesentlichen nach unten ausgerichtete Ebene des ersten Verriegelungselements unter einem Winkel (γ) in Bezug auf die Horizontale (68) im Bereich von 3°-20°, vorzugsweise im Bereich von 5°-15° und am bevorzugten von etwa 10° vorgesehen ist. 55
5. Verpackungseinheit nach einem oder mehreren der vorhergehenden Ansprüche, wobei das zweite Ver-

riegelungselement unter einem Winkel (α) in Bezug auf die vordere Fläche (18) des Abdeckteiles im Bereich von 20°-60°, vorzugsweise im Bereich von 30°-50° und am bevorzugten von etwa 40° vorgesehen ist.

6. Verpackungseinheit nach Anspruch 5, wobei die ersten und zweiten Verriegelungselemente derart angeordnet sind, dass eine Kontaktfläche zwischen den ersten und zweiten Verriegelungselementen zunimmt, wenn eine zunehmende, nach oben gerichtete Kraft auf das Abdeckteil ohne Öffnen der Verpackungseinheit ausgeübt wird. 10
7. Verpackungseinheit nach einem oder mehreren der vorhergehenden Ansprüche, wobei die vordere Fläche (18) des Abdeckteiles zwei Teile (62, 64) umfasst, die in vertikaler Richtung im Wesentlichen übereinander unter einem Winkel relativ zueinander vorgesehen sind, wobei ein erstes, unteres Teil (62) und ein zweites Teil (64) über dem ersten Teil die eine oder mehreren Öffnungen in der vorderen Fläche enthalten. 20
8. Verpackungseinheit nach einem oder mehreren der vorhergehenden Ansprüche, wobei das erste Verriegelungselement eine vordere Fläche aufweist, die eine Prägung (46) umfasst. 25
9. Verpackungseinheit nach einem oder mehreren der vorhergehenden Ansprüche, ferner umfassend ein Hinweisschild (36, 42, 136, 142, 236, 244, 250, 260), welches an dem Abdeckteil vorgesehen ist, wobei das Hinweisschild einen Einschnitt (38, 138, 238, 246, 252, 262) enthält, um dem ersten Verriegelungselement zu ermöglichen, sich teilweise durch die Öffnung zu erstrecken. 30
10. Verpackungseinheit nach Anspruch 9, wobei der Einschnitt einen gekrümmten Einschnitt (238, 246, 252, 262) umfasst, der gestaltet ist, um dem Nocken zu ermöglichen, sich teilweise durch die Öffnung in dem Abdeckteil zu erstrecken. 35
11. Verpackungseinheit nach einem oder mehreren der vorhergehenden Ansprüche, wobei das erste Verriegelungselement durch Formen und/oder Pressen gebildet und mit einer geschlossenen äußeren Fläche versehen ist. 40
12. Verfahren zum Verpacken von Produkten, wie Eiern, umfassend den Schritt des Bereitstellens einer Verpackungseinheit (2, 34, 40, 202, 248) nach einem oder mehreren der Ansprüche 1 bis 11 und des Unterbringens von einem oder mehreren der Produkte darin. 45

Revendications

1. Unité d'emballage (2, 34, 40, 202, 248) composée de cellulose moulée pour des produits tels que des oeufs, comprenant : 5
 - une partie de fond (4) munie de compartiments (28) pour des produits individuels ;
 - une partie de couvercle (14) comprenant des surfaces supérieures avant (18) et arrière, la surface avant comprenant une ou plusieurs ouvertures (58) ;
 - un premier élément de verrouillage s'étendant vers le haut à partir de la partie de fond définissant une came (48) qui, lorsque l'unité d'emballage est dans une position fermée, s'étend en partie à travers l'une des une ou plusieurs ouvertures, la came ayant une surface de verrouillage orientée au moins en partie vers le bas (56), la surface ayant une longueur (D2) et une largeur, de sorte que la longueur de la came s'étend en partie à travers l'ouverture dans la surface avant de la partie de couvercle dans une position fermée de l'unité d'emballage ; et
 - un second élément de verrouillage façonné comme une lèvre ou un bord (66), ayant une longueur (D1) et une largeur, s'étendant au moins en partie vers l'intérieur à partir de la surface avant de la partie de couvercle sur la longueur, de sorte que le premier et le second élément de verrouillage définissent un verrou (30) pour l'unité d'emballage, dans laquelle le second élément de verrouillage peut s'enclencher avec le premier élément de verrouillage, avec sa longueur, dans un état de verrouillage de l'unité d'emballage, **caractérisée en ce que** le rapport entre la longueur de la came et la longueur du second élément de verrouillage est dans la plage de 1,25 à 3.
2. Unité d'emballage selon la revendication 1, dans laquelle le rapport est dans la plage de 1,5 à 2,5, de préférence dans la plage de 1,6 à 2,2 et, de manière préférée entre toutes, d'environ 1,8.
3. Unité d'emballage selon la revendication 1 ou 2, dans laquelle le second élément de verrouillage a une longueur d'environ 3,5 à 8 mm, de préférence d'environ 5 mm.
4. Unité d'emballage selon la revendication 1, 2 ou 3, dans laquelle le plan orienté sensiblement vers le bas du premier élément de verrouillage est prévu à un angle (γ) par rapport à l'horizontale (68) dans la plage de 3° à 20°, de préférence dans la plage de 5° à 15° et, de manière préférée entre toutes, d'environ 10°. 50

5. Unité d'emballage selon une ou plusieurs des revendications précédentes, dans laquelle le second élément de verrouillage est prévu à un angle (α) par rapport à la surface avant (18) de la partie de couvercle dans la plage de 20° à 60°, de préférence dans la plage de 30° à 50°, et de manière préférée entre toutes d'environ 40°. 5
6. Unité d'emballage selon la revendication 5, dans laquelle les premier et second éléments de verrouillage sont agencés de sorte qu'une surface de contact entre les premier et second éléments de verrouillage augmente lors de l'application d'une force croissante dirigée vers le haut sur la partie de couvercle sans ouvrir l'unité d'emballage. 10 15
7. Unité d'emballage selon une ou plusieurs des revendications précédentes, dans laquelle la surface avant (18) de la partie de couvercle comprend deux parties (62, 64) qui sont prévues sensiblement l'une au-dessus de l'autre dans une direction verticale selon un certain angle l'une par rapport à l'autre, avec une première partie inférieure (62) et une seconde partie (64) au-dessus de la première partie comprenant les une ou plusieurs ouvertures dans la surface avant. 20 25
8. Unité d'emballage selon une ou plusieurs des revendications précédentes, dans laquelle le premier élément de verrouillage a une surface avant comprenant un gaufrage (46). 30
9. Unité d'emballage selon une ou plusieurs des revendications précédentes, comprenant en outre une étiquette (36, 42, 136, 142, 236, 244, 250, 260) qui est prévue sur la partie de couvercle, dans laquelle l'étiquette comprend une découpe (38, 138, 238, 246, 252, 262) pour permettre au premier élément de verrouillage de s'étendre en partie à travers l'ouverture. 35 40
10. Unité d'emballage selon la revendication 9, dans laquelle la découpe comprend une découpe incurvée (238, 246, 252, 262) qui est configurée pour permettre à la came de s'étendre en partie à travers l'ouverture dans la partie de couvercle. 45
11. Unité d'emballage selon une ou plusieurs des revendications précédentes, dans laquelle le premier élément de verrouillage est formé par moulage et/ou pressage et est pourvu d'une surface externe fermée. 50
12. Procédé pour emballer des produits tels que des oeufs, comprenant l'étape de fourniture d'une unité d'emballage (2, 34, 40, 202, 248) selon une ou plusieurs des revendications 1 à 11, et le placement à l'intérieur d'un ou plusieurs des produits. 55

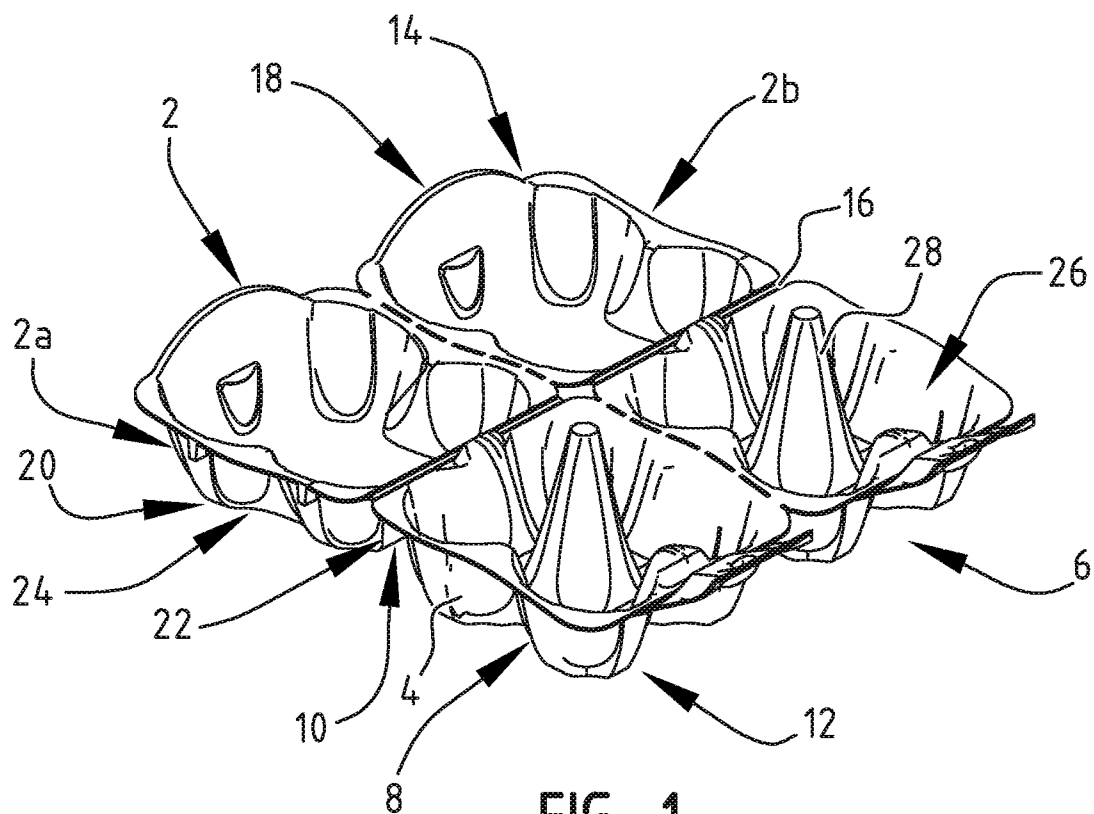


FIG. 1

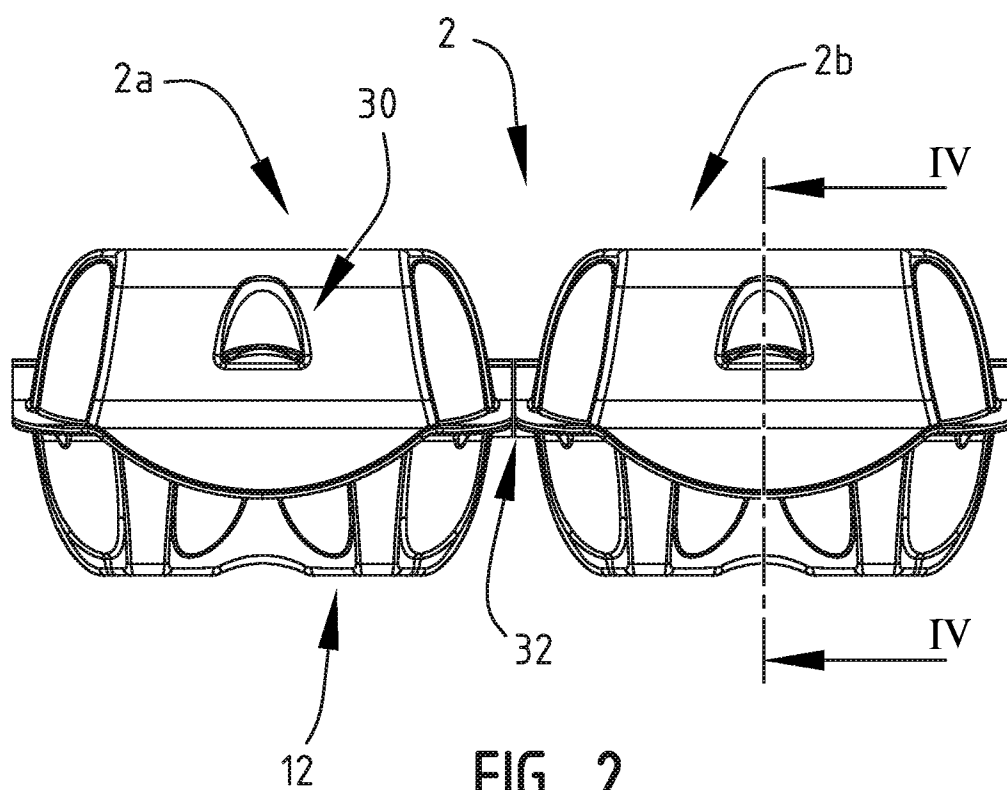


FIG. 2

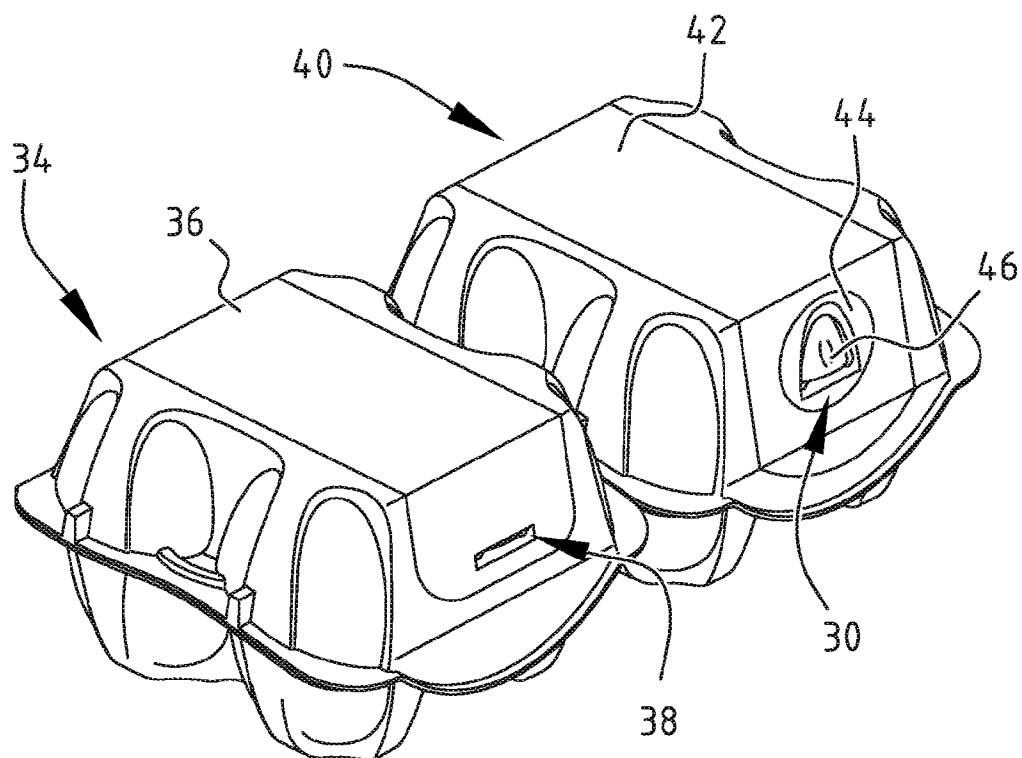


FIG. 3A

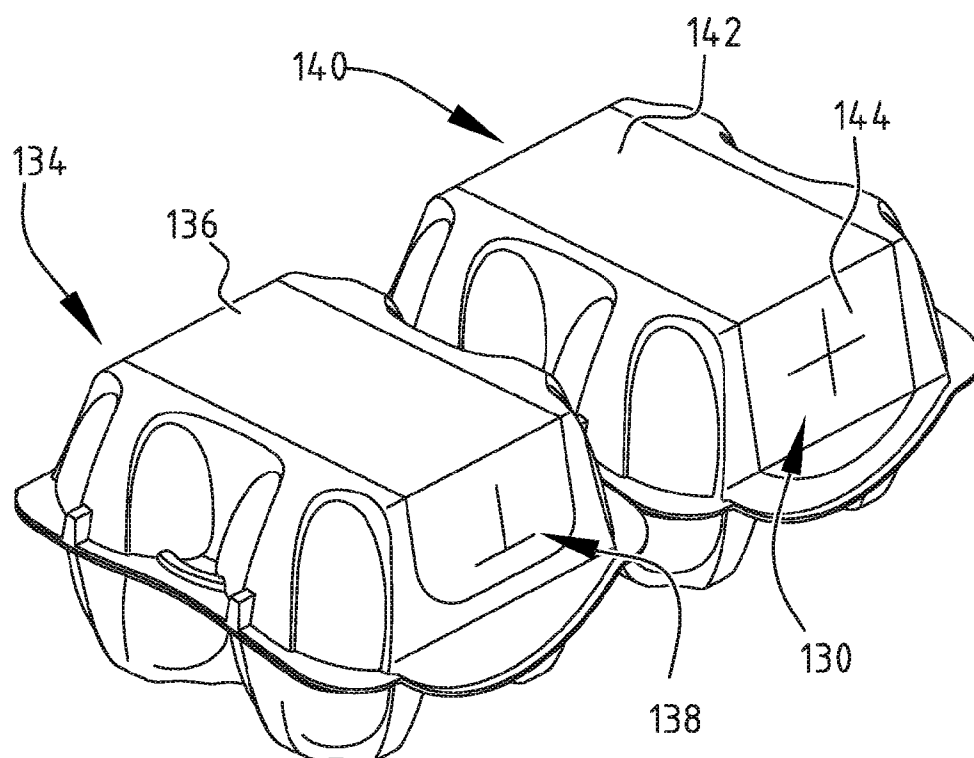


FIG. 3B

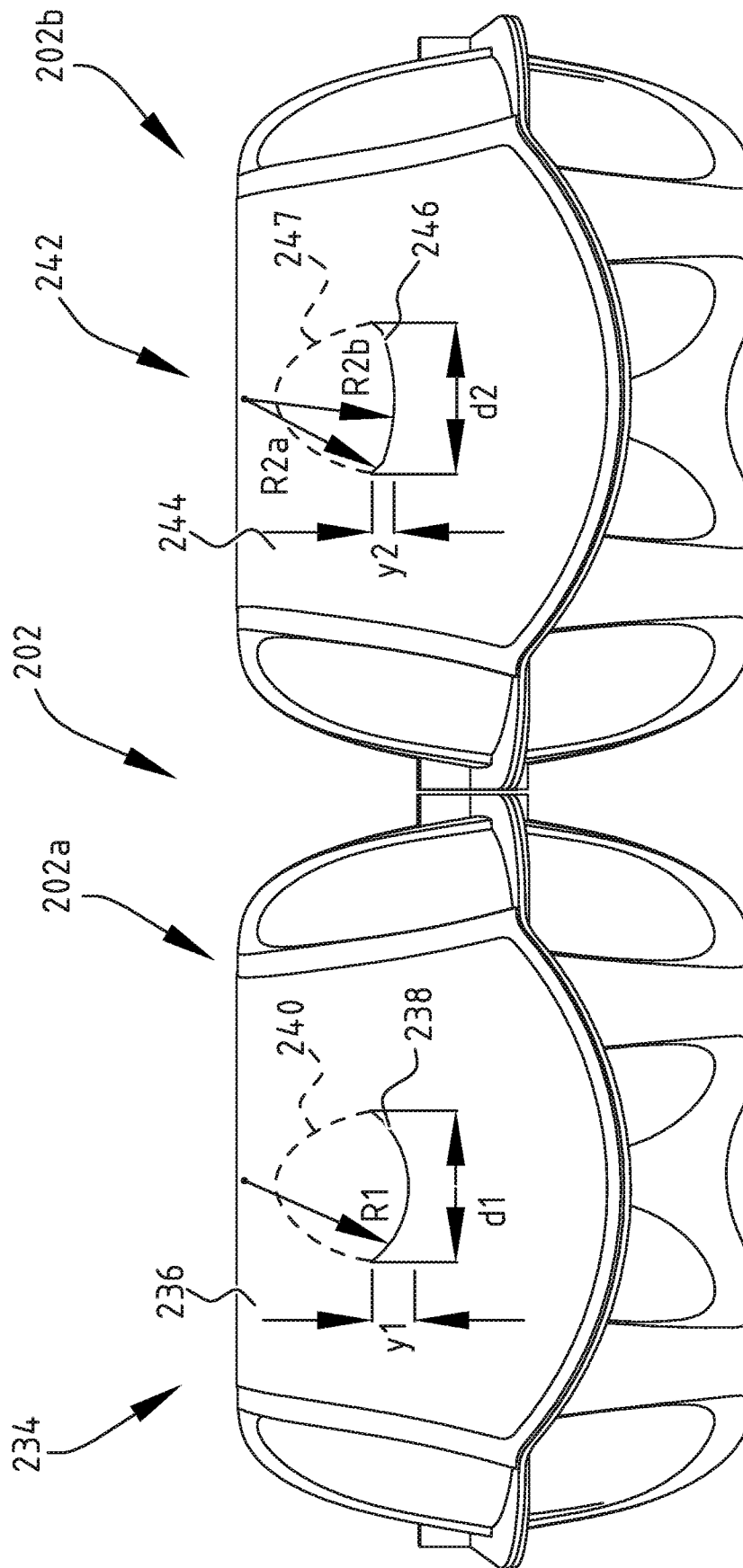


FIG. 3C

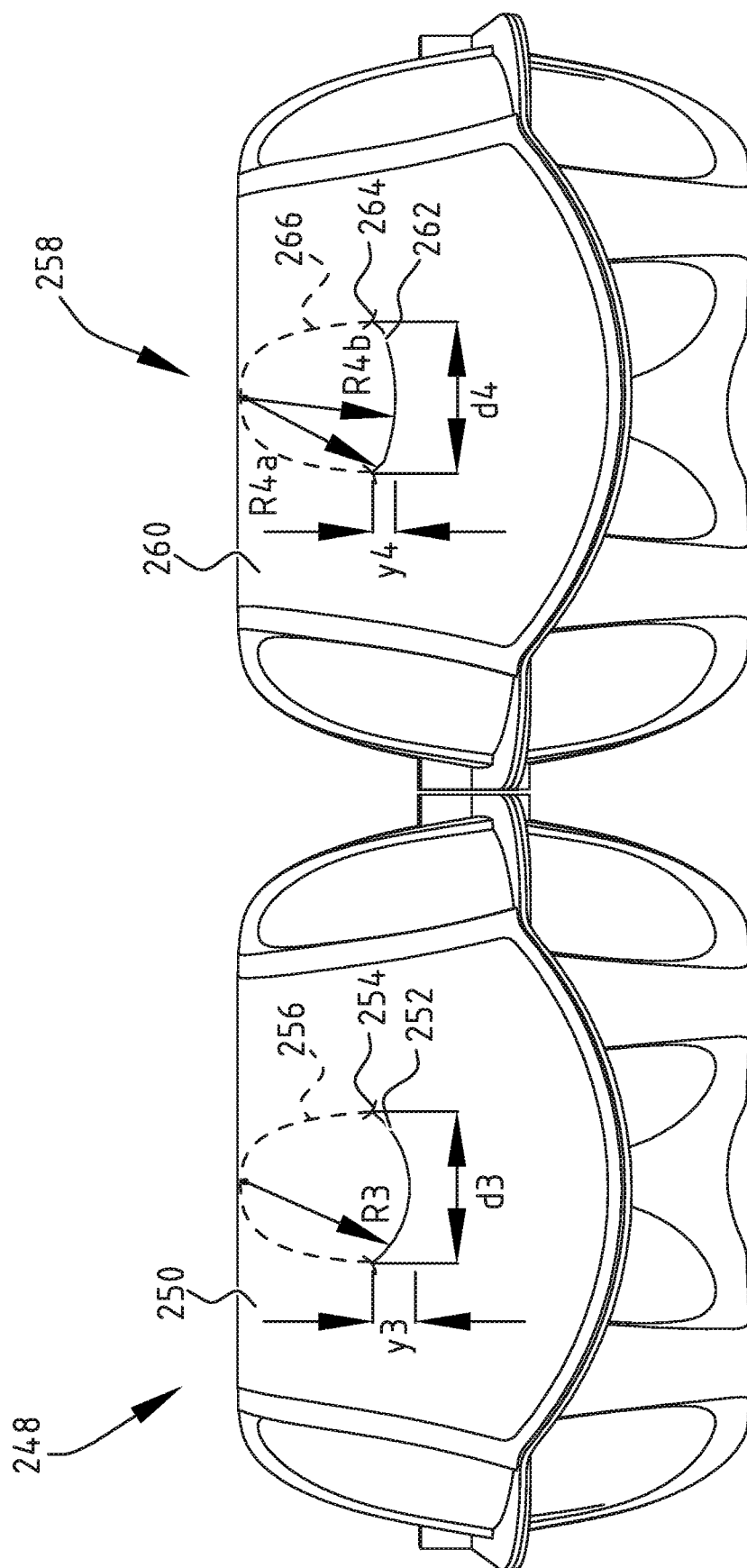


FIG. 3D

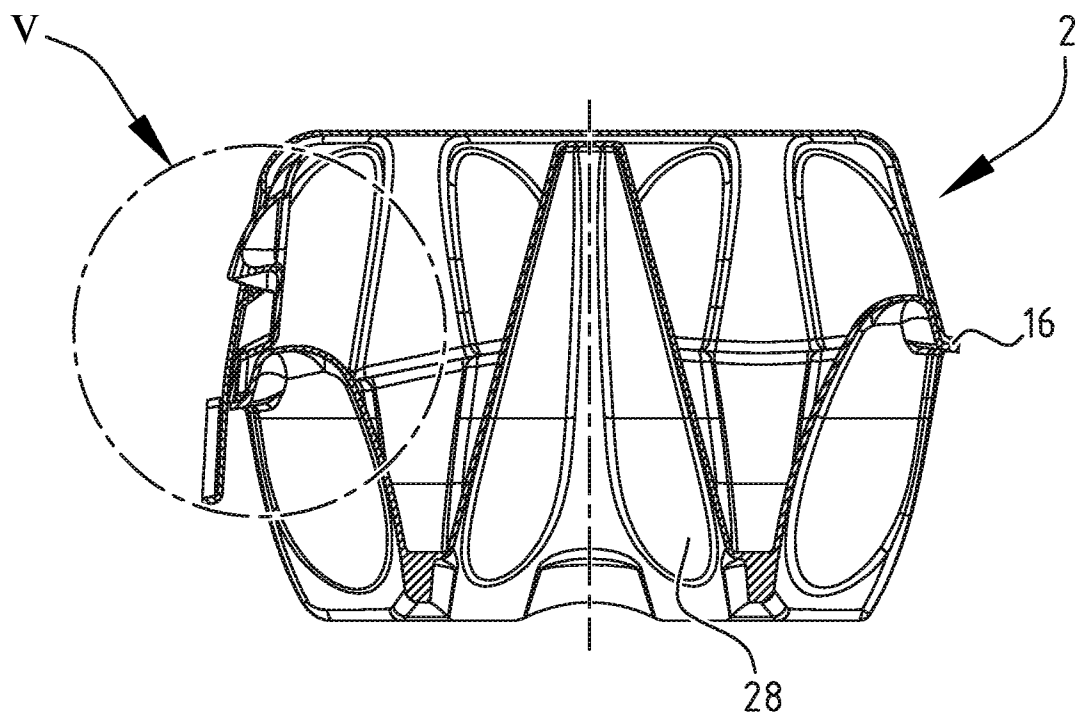


FIG. 4

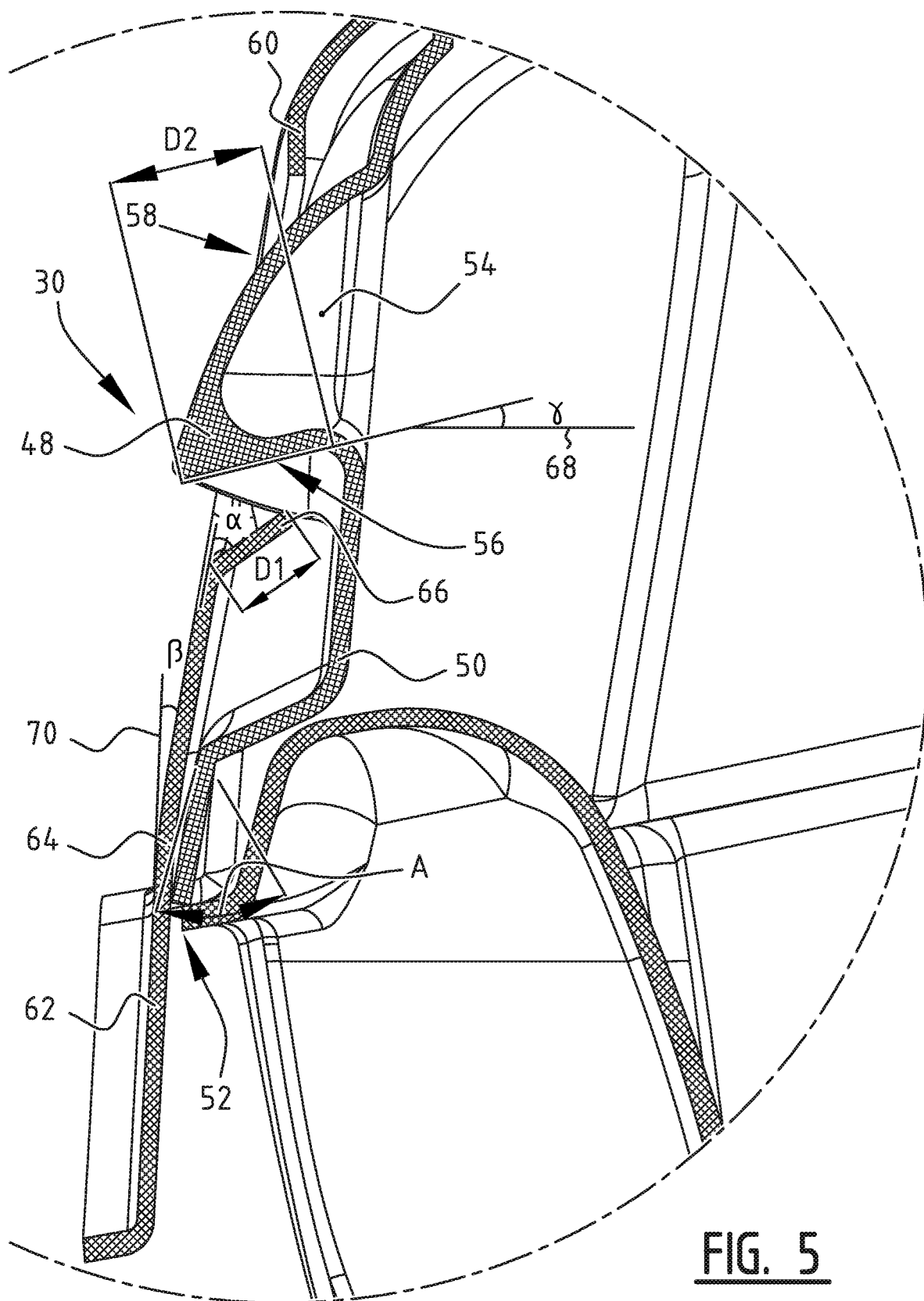


FIG. 5

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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CSOMAGOLÓEGYSÉG ZÁRRAL ÉS ELJÁRÁS TERMÉKEK CSOMAGOLÁSÁRA

Szabadalmi igénypontok

- 3 1. Csomagolóegység (2, 34, 40, 202, 248) tojásszerű termékekhez, amely formázott papírpépből van előállítva és tartalmaz:
- alsó részt (4), amely különálló termékek számára rekeszekkel (28) van ellátva;
 - fedőrészt (14), melynek felső, előlso (18) és hátulso felületei vannak, az előlso felület egy vagy több nyílást (58) tartalmaz;
- 10 - első záróelemet, amely az alsó résztől felfelé terjedő bütyköt (48) képez, amely a csomagolóegység csukott helyzetében részben az egy vagy több nyílás egyikén át terjed, a bütyöknek legalább részben lefelé néző zárófelülete (56) van, a felületnek olyan hossza (D2) és szélessége van, hogy a bütyök hossza a csomagolóegység csukott helyzetében részben a fedőrész előlso felületében lévő nyíláson át terjed; és
- második záróelemet, amely ajak vagy perem (66) alakú, hossza (D1) és szélessége van, a fedőrész előlso felületétől a hosszában legalább részben befelé terjed úgy, hogy az első és a második záróelem a csomagolóegység számára zárat (30) határoz meg, ahol a csomagolóegység záró helyzetében a második záróelem a hossza mentén az első záróelemmel való összekapaszkodásra képes, **azzal jellemezve**, hogy a bütyök hosszának és a második záróelem hosszának aránya az 1,25-3 tartományban van.
- 15 2. Az 1. igénypont szerinti csomagolóegység, ahol az arány az 1,5-2,5 tartományban, előnyösen az 1,6-2,2 tartományban van, és legelőnyösebben mintegy 1,8.
- 20 3. Az 1. vagy a 2. igénypont szerinti csomagolóegység, ahol a második záróelem hossza mintegy 3,5-8 mm, előnyösen mintegy 5 mm.
4. Az 1., a 2. vagy a 3. igénypont szerinti csomagolóegység, ahol az első záróelem lényegében lefelé irányított felülete a vízszintessel (68) a 3°-20° tartományba eső, előnyösen az 5°-15° tartományba eső, és
- 25 legelőnyösebben mintegy 10° szöget (γ) zár be.
5. Az előző igénypontok bármelyike szerinti csomagolóegység, ahol a második záróelem a fedőrész előlso felületével (18) 20°-60° tartományba eső, előnyösen 30°-50° tartományba eső, legelőnyösebben mintegy 40° szöget (α) zár be.
6. Az 5. igénypont szerinti csomagolóegység, ahol az első és a második záróelem úgy van elrendezve,
- 30 hogy az első és a második záróelem közötti érintkezési felület, növekedő felfelé irányuló erőnek a fedőrészre a csomagolóegység felnyitása nélkül történő kifejtésekor, növekszik.
7. Az előző igénypontok bármelyike szerinti csomagolóegység, ahol a fedőrész előlso felülete (18) két részt (62, 64) tartalmaz, melyek függőleges irányban lényegében egymás felett, egymással szögelt bezárón vannak elrendezve, első alsó résszel (62) és az első rész feletti második résszel (64), amely az előlso felületben
- 35 lévő egy vagy több nyílást tartalmazza.
8. Az előző igénypontok bármelyike szerinti csomagolóegység, ahol az első záróelemnek dombsornyomást (46) tartalmazó előlso felülete van.
9. Az előző igénypontok bármelyike szerinti csomagolóegység, amely címkét (36, 42, 136, 142, 236, 244, 250, 260) tartalmaz, amely a fedőrészen van, ahol a címke az első záróelemnek részben a nyíláson át
- 40 terjedését lehetővé tevő bemetszést (38, 138, 238, 246, 252, 262) tartalmaz.



10. A 9. igénypont szerinti csomagolóegység, ahol a bemetszés ívelt bemetszést (238, 246, 252, 262) tartalmaz, amely a bűtyöknek a fedőrészben lévő nyíláson át terjedését lehetővé tevően van kiképezve.

11. Az előző igénypontok bármelyike szerinti csomagolóegység, ahol az első záróelem mimikázással és/vagy sajtolással van kiképezve, továbbá zárt külső felülettel van ellátva.

5 12. Eljárás tejásszerű termékek csomagolására, amely során egy, az 1-11. igénypontok bármelyike szerinti csomagolóegységet (2, 34, 40, 202, 248) biztosítunk és benne egy vagy több terméket helyezünk el.