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(54) **Arrangement for securing/releasing of a lid to/from a container**

(57) The present invention relates to an arrangement for assisted securing/releasing of a lid (40; 50) to/from a container (10; 20; 30). The arrangement comprises: a container; a lid configured to close the container; and a flange with mechanically bistable characteristics such that it is flippable between a first (P1) and a second (P2) stable position by a force applied in the direction towards

the other stable position. The container is closed by arranging the lid over the opening and apply a force in the direction towards the container to flip the flange from the first (P1) to the second stable position (P2), and the lid released from the container by applying a force in the direction from the container to flip the flange back to the first stable position (P1)

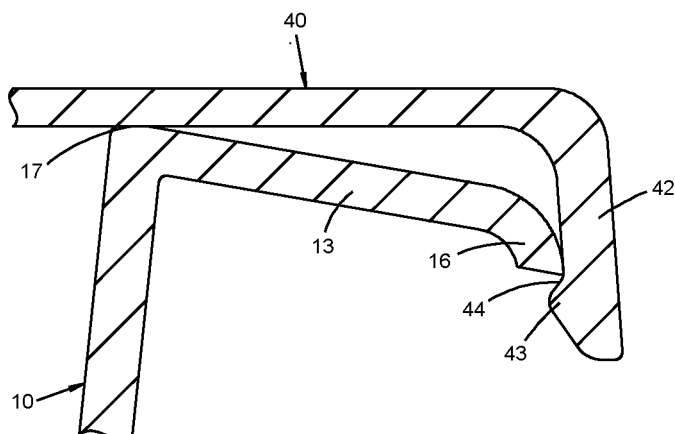


Fig 3

Description

Field of the invention

[0001] The present invention relates to an arrangement for assisted securing/releasing of a lid to/from a container.

Background of the invention

[0002] Different types of articles, such as for example dairy product, provisions and other types of foodstuff are stored and sold in containers closed by a removable lid. If not all of the content within the container is consumed at the same time, it is desired to be able to close and open the container a number of times in order to maintain the freshness of the content within the container. A reliably sealing of the lid to the container is consequently advantageous.

[0003] Different types of container are used for this purpose today. One type of container is disclosed in EP 219 40 02. The disclosed container comprises a flat lid element attached to a circumferential collar element of the container. The container is formed by a plastic material that makes it possible to manufacture the container to a reasonable cost and provide the desired sealing between the container and the lid to ensure that the content within the container maintains the desired characteristics.

[0004] However, it has turned out that it is difficult for the user to achieve the desired closing and sealing of the container once the container has been opened.

[0005] Consequently there is a need for an improved container arrangement that facilitates repeated closing/opening of the container.

Summary of the invention

[0006] The present invention, defined in the appended claims, provides an arrangement for assisted securing/releasing of a lid to/from a container.

[0007] The claimed arrangement for assisted securing/releasing of a lid to/from a container comprises:

a container comprising a container wall and an opening formed in the container wall and arranged in a plane A;

a lid configured to close the container opening, said lid comprises a collar enclosing said container opening;

a flange extending from said container wall towards the collar of the lid, or from said collar towards the container wall, said flange has mechanically bistable characteristics such that it is flippable between a first and a second stable position by a force applied in the direction towards the other stable position, said flange is arranged in the first stable position before the lid is attached and the second stable position after the lid has been secured to the container;

a shoulder arranged on the lid on side of the collar facing the container and the flange, or on the side of the container wall that is facing the collar and the flange; wherein the opening of the container is closed by arranging the lid over the opening to engage said flange and said shoulder and apply a force in the direction towards the container to flip the flange from the first to the second stable position, and the lid released from the container by applying a force in the direction from the container to flip the flange back to the first stable position.

[0008] The claimed arrangement fulfils the needs defined above since the bistable characteristics of the flange that is used for connecting the lid to the container will assist both the securing of the lid to the container and the releasing of the lid from the container as soon as the required force is applied on the lid to flip the flange.

[0009] Before the lid is secured to the container, the flange is arranged in the first stable position. In order to secure the lid and close the container, the lid is arranged in the intended position covering the opening and with the shoulder engaging the outer end of the flange. A force is applied on the lid, and consequently at the same time on the flange, in the direction towards the second stable shape of the flange. The applied force should be large enough to flip the flange from the first to the second stable shape. Due to the bistable characteristic of the flange, the lid will be drawn towards the container together with the flange when the flipping takes place and thereby close the opening of the container in a more convenient way than for containers of previous known types.

[0010] The force applied on the lid, and the flange, is preferably applied in a directions substantially perpendicular to the plane A of the opening and must exceed the spring force of the bistable flange in order to achieve the desired flipping of the flange from one position towards the other. As a consequence of the bistable characteristic of the flange, each specific flange design has a spring force resulting from the shape and dimensions of the flange as well as the material of the flange.

[0011] The flange is designed to have a mechanical bistable characteristic which means that it has two different stable positions. These stable positions are arranged on opposite sides of the plane F defined by the flange base on the container wall, or collar of the lid. The bistable character is achieved by the design of the flange in combination with an elastic material that makes it possible for the flange to flip from one position to the other without breaking. The design of the flange and the selection of material are both parameters that could be used in order to design a flange with the desired properties, such as for example the spring force of the flange. For example, a flange made of a material with higher E-module will require a larger force to flip from one position to the other than a flange made of a material with lower E-module, and a flange with less thickness will be easier to flip from one position to the other than a flange with larger thick-

ness if the same material is used. Equally a flange made of a material with higher E-module will have a larger spring force than a flange made of a material with lower E-module.

[0012] In one embodiment of the arrangement, the flange extend around the entire opening of the container and the shoulder around the entire collar of the lid, alternatively around the entire collar of the lid and the shoulder around the entire container wall. These embodiments of the arrangement provides a reliably securing of the lid to the container since lid will be secured in the intended closed position around the entire periphery of the opening. This embodiment furthermore provides a flange with a reliable bistable characteristic that will be usable for a long period of time.

[0013] In one embodiment of the arrangement, the first and second stable position of the flange are arranged on opposite sides of a plane F parallel to the plane A of the opening. This embodiment provides an arrangement that makes it easy to attach the lid to the container and achieve the desired flipping of the flange.

[0014] In one embodiment of the arrangement, the container wall has an edge surrounding the opening, said edge is substantially flat and parallel to the plane A, or rounded, said edge is intended to be in contact with the surface of the lid that is facing the container. The flat or rounded edge in contact with the side of the lid that is facing the container provides a tight and reliably sealing between the container and the lid.

[0015] In one embodiment of the arrangement, the distance S between the surface of the lid that is in contact with the edge of the container and the shoulder on the collar is equal or less than the vertical distance E between the edge of the container and the second stable position of the bistable flange if the flange is extending from the container wall. This embodiment ensures that the desired sealing between the container and the lid will be achieved when the lid is secured to the container.

[0016] In one embodiment of the arrangement, the distance S is larger than the distance between the plane F and the first stable position of the flange, and less than the distance between the edge and the second stable position to ensure that the lid is maintained in contact with the edge of the container wall. This embodiment improves the sealing further since the flange will apply a pressure on the lid towards the edge of the container.

[0017] In one embodiment of the arrangement, the angle (α) between the first and second stable position of the flange is within the range of 60° to 135°. A bistable flange with this characteristic provides the desired assisted closing of the container and a reliable securing of the lid to the container.

[0018] In one embodiment of the arrangement, the container opening and the lid are substantially circular. It has turned out that the claimed arrangement is particularly advantageous for use in combination with a circular opening since the flange could have a continuous shape and extend around the entire opening which result

in both the desired assisted closing of the container and a strong securing of the lid around the entire periphery of the opening.

[0019] In one embodiment of the arrangement, at least the flange of the container or lid is made of an elastic plastic material able to withstand repeated deformations without breaking and provide a container that could be closed and opened the desired number of times.

[0020] In one embodiment of the arrangement the container opening and the lid are substantially circular. An embodiment with circular opening and lid ensures a strong and reliable closing and sealing between the container and lid since the force provided by the bistable flange will be substantially constant around the entire opening / lid. In one embodiment of the arrangement, at least the flange is made of an elastic plastic material able to withstand repeated deformations without breaking in order to ensure that the arrangement is usable for a number of operation cycles.

[0021] In one embodiment of the arrangement, the lid has a substantially flat circular central section formed by a folie with a thickness between 50 and 500 μm . This embodiment is favourable since the folie due to its limited thickness will be in contact with the edge surrounding the opening and provide a very satisfying sealing between the lid and the container.

[0022] In one embodiment of the arrangement, the flange is arranged on the container and the shoulder on the collar of the lid. This embodiment provides a container and lid that could be produced in an efficient and economically beneficial way.

[0023] In one embodiment of the arrangement, the flange comprises a flange base secured to, or formed together with the container wall or collar, and a flange protrusion extending from said flange base. This embodiment of the flange both provides the reliable closing as well as a flange that is producible in an efficient way.

[0024] In one embodiment of the arrangement, the flange protrusion has a substantially constant thickness and a rounded outer end. This embodiment of the flange both provides the reliable closing as well as a flange that is producible in an efficient way

[0025] In one embodiment of the arrangement, the thickness of the flange base is smaller than the thickness of the flange protrusion. This embodiment is favourable since the flipping from one stable position to the other is facilitated.

[0026] The described embodiments of the arrangement could of course be combined in different ways without departing from the scope of the invention that will be described more in detail in the detailed description.

Brief description of the drawings

[0027] Different embodiments of the arrangement according to the invention are illustrated in the appended figures.

- Figure 1a illustrates a cross section of selected parts of a first embodiment of a container.
- Figure 1b illustrates a cross section of selected parts of a second embodiment of a container.
- Figure 1c illustrates a cross section of selected parts of a second embodiment of a container.
- Figure 2a illustrates a cross section of selected parts of a first embodiment of a lid.
- Figure 2b illustrates a cross section of selected parts of a second embodiment of a lid
- Figure 3 illustrates a cross section container and lid when the lid is secured to the container to close the container.

Detailed description of embodiments

[0028] In figure 1a to 1c, selected parts of a container 10, 20, 30 are illustrated. The container could have any possible shape and size depending on the intended use of the container.

[0029] The container 10, 20, 30 comprises a container wall 11, 21, 31 with a substantially constant thickness. In the illustrated embodiments the containers are substantially cup-shaped with a substantially circular horizontal cross section. The diameters of the containers are increasing slightly towards the top of the container, and for example made of a suitable plastic material.

[0030] In the top part of the containers an opening 12, 22, 32 is formed. The openings are substantially circular and arranged in a plane A. The plane A is in the illustrated embodiments arranged substantially horizontal and perpendicular to a vertical axis V of the containers extending through the centre of the container. A number of other positions of the openings are however also possible if the container is adapted for different contents.

[0031] From the container wall 11, 21, 31 a flange 13, 23, 33 is extending outwards from the container. The flange is preferably continuous and extending around the entire opening 12, 22, 32. The flange comprises a flange base 14, 24, 34 and a flange protrusion 15, 25, 35 extending from the flange base 14, 24, 34. The flange base 14, 24, 34 is permanently secured to the container wall, alternatively integrally formed together with the container wall at the same time as the container is manufactured as in the illustrated embodiments. The flange protrusions 15, 25, 35 have a substantially constant thickness along the flange and are ended by a rounded flange edge 16, 26, 36.

[0032] The flanges 13, 23, 33 of the illustrated containers have bistable characteristics, i.e. they are movable between two different stable positions, a first P1 and a second P2 stable position without breaking. The two stable positions are arranged symmetrically on the different sides of a plane F extending through the centre of the flange base, and the flange is flipped from one stable position to the other when a force is applied on the flange in the direction towards the stable position where the flange not is located. In the different embodiments illus-

trated in figure 1a - c, the first stable position P1 is located above plane F, and the second stable position p2 located below plane F.

[0033] The bistable characteristic of the flange is achieved by the design of the flange in combination with an elastic material that makes it possible for the flange to withstand repeated deformations that occur when the flange is flipped from one stable position to the other without breaking.

[0034] The flange is either arranged extending from the edge 17 of the container wall surrounding the opening 12 as illustrated in figure 1a, or extending from the outer side of the container wall 21, 31 and away from the container as in figure 1b and c. The flange protrusion is in all of the illustrated embodiments extending along a substantially straight line from the flange base away from the container wall. The flange protrusion is ended by a rounded or slightly curved flange end 16, 26, 36. As a consequence of the flipping of the flange from one stable position to the other, the flange end is moved a distance d along the vertical direction of the container. The length of the distance d depends on the length of the flange protrusion and the angle α between the two stable positions of the flange.

[0035] In an alternative embodiment of the flange, not illustrated in the figures, the flange base has a smaller thickness than the flange protrusion. This embodiment is favourable since the flipping of the flange from one stable position to the other is facilitated, and a substantially straight flange protrusion without deformations is ensured since the flange base will have an increased elasticity.

[0036] The container is closed by a lid 40, 50. Two different embodiments of the lid are illustrated in figure 2a and 2b. The lids 40, 50 are substantially circular with a diameter corresponding to the size of the opening in the container. The lids 40, 50 comprise a substantially flat central section 41, 51 and a collar 42, 52 extending substantially perpendicularly from the flat central section 41, 51 towards the container.

[0037] The collar 42, 52 has an inner diameter corresponding to the outer diameter of the flange 13, 23, 33 in order to enclose the container opening and the flange 13, 23, 33 that extend from the container wall. Furthermore the collar element has a length from the side of the central section that is facing the container that exceeds the vertical distance d that the flange is moved during the transition from one stable position to the other. On the side of the collar 42, 52 that is facing the flange 13, 23, 33 of the container a shoulder 43, 53 protrude from the collar in order to create a contact surface 44, 54 against which the outer end 16, 26, 36 of the flange 13, 23, 33 can engage. The shoulder has a curved contact surface that will be in contact with the outer end of the flange once the lid is secured to the container. The curvature of the contact surface is designed to correspond to the outer end of the flange of the container to ensure a reliable engagement between the flange and the shoul-

der.

[0038] In the lid illustrated in figure 2a, the central section is shaped like a flat plate with a substantially constant thickness. The side 45 of the lid that is facing the container will after the lid has been secured to the container be in contact with the edge surrounding the opening of the container and provide the desired sealing of the container opening. The lid in figure 2b differs from the one in figure 2a in that the central section is formed by a thin film 55. The film is, due to its small thickness, more flexible compared to the flat plate which is advantageous since the flexible film will adapt to the edge of the container and provide a reliably sealing between the container edge and the lid. The central section of the lid could of course also be curved or provided with one or more grooves or protrusions as long as a flat surface or a groove with a shape corresponding to the edge of the container is provided to be in contact with the edge surrounding the opening of the container.

[0039] In figure 3 one embodiment of the arrangement is illustrated. The lid 40 is secured to the container 10 to close the container opening 12. Before the lid is secured, the flange 13 is arranged in the first stable position P1, i.e. the flange extending upwards from the container wall 11. In order to secure the lid 40 to the container 10, the lid is arranged over the container opening and the flange end 16 of the container arranged above the shoulder 43 on the collar 42. Once the flange 13 is in the intended position enclosed by the collar 42 of the lid 40, a force is applied on the lid in the direction towards the second stable position P2 of the flange 13. When the applied force exceeds the spring force of the bistable flange 13, the flange is flipped from the first stable position P1 to the second stable position P2. At the same time as the bistable flange is flipped, the lid 40 is moved together with the flange 13 towards the second stable position P2 of the flange 13. The movement of the lid towards the container brings the surface 45 of the central section 41 of the lid in contact with the outer end 17 of the container wall and seals the compartment within the container.

[0040] In order to achieve a satisfying sealing between the edge surrounding the opening and the side of the central section of the lid that is in contact with the edge it is essential that the distance S, illustrated in figure 2a, between the surface 45 of the central section 41 and the contact surface 44 of the shoulder 43 correspond to the vertical distance between the edge 17 of the container wall and the second stable position P2 of the bistable flange 13.

[0041] The distance S must be larger than the distance between the edge 17 of the container and the plane F in order to make it possible for the flange to flip from the first stable shape to the second stable shape. However, the distance could not exceed the distance E between the edge 17 of the container and the second stable position P2, i.e. the distance between the plane A and the second stable position P2, to ensure that the surface 45 of the central section 41 is maintained in contact with the

edge 17 of the container wall 11.

[0042] Preferably the distance S is smaller than the distance between the edge 17 of the container wall 11 and the second stable position P2 of the flange since the smaller distance S will prevent the flange to reach the second stable position and, due to the characteristic of the bistable flange, apply a force on the shoulder of the lid that is continuously pressing the surface 45 of the central section 41 towards the edge 17 of the container 10.

[0043] One favourable embodiment of the arrangement, not illustrated in the figures, comprises one, or more, sealing indicator devices. The sealing indicator devices consist of a breakable plastic device that extends between the flange and the container wall or collar. The plastic devices are manufactured together with the container, or lid, and secure the flange in the second stable position of the bistable flange. The sealing indicator devices secure the flange until the sealing indicator is damaged when the container is opened for the first time. Embodiments of the arrangement comprising sealing indicator devices are very advantageous if the container is used for dairy product, provisions or other types of foodstuff since the container is filled and sealed by the lid without using the bistable flange at the production plant before they are delivered to the intended user or store. The sealing indicator devices, if not damaged, provide a visible verification that the lid has not been removed from the container at an earlier occasion which could be devastating for quality of the product within the container.

[0044] Furthermore, after the container has been filled with the dairy product, provisions or other types of foodstuff and the lid is attached to close the container, an additional sealing between the container edge and the surface of the lid could be provided. The additional sealing is arranged around the entire opening of the container between the edge of the container and the surface of the lid in contact with the edge and provides a breakable sealing that prevents dirt or bacteria from entering the container before the container reaches the intended user. Once the user detaches the lid from the container, the additional sealing is destroyed.

[0045] Even though all embodiments that have been described above are directed to arrangements where the flange is extending from the container wall towards the shoulder arranged on the side of the collar of the lid that is facing the flange the invention is not limited to these embodiments. The position of the flange and the shoulder could be switched and the bistable flange extending from the surface of the collar towards a shoulder arranged on the container wall and the bistable characteristic of the flange used in order to assist in the securing of the lid on the container by flipping the flange from one stable position to the other in the same manner as described above.

[0046] The different embodiments described above could all be combined and modified in different ways without departing from the scope of the invention that is de-

fined by the appended claims.

Claims

1. Arrangement for assisted securing/releasing of a lid (40; 50) to/from a container (10; 20; 30), said arrangement comprising:

a container (10; 20; 30) comprising a container wall (11; 21; 31) and an opening (12; 22; 32) formed in the container wall and arranged in a plane A;

a lid (40; 50) configured to close the container opening, said lid comprises a collar (42; 52) enclosing said container opening;

a flange (13; 23; 33) extending from said container wall towards the collar of the lid, or from said collar towards the container wall, said flange (13; 23; 33) has mechanically bistable characteristics such that it is flippable between a first (P1) and a second (P2) stable position by a force applied in the direction towards the other stable position, said flange is arranged in the first stable position before the lid is attached and the second stable position after the lid has been secured to the container;

a shoulder (42; 52) arranged on the lid on side of the collar facing the container and the flange, or on the side of the container wall that is facing the collar and the flange; wherein

the opening of the container is closed by arranging the lid over the opening to engage said flange and said shoulder and apply a force in the direction towards the container to flip the flange from the first to the second stable position (P2), and the lid released from the container by applying a force in the direction from the container to flip the flange back to the first stable position (P1).

2. The arrangement according to claim 1, wherein the flange (13; 23; 33) extend around the entire opening of the container and the shoulder (42; 52) around the entire collar of the lid, or the flange extend around the entire collar of the lid and the shoulder around the entire container wall.
3. The arrangement according to anyone of the previous claims, wherein the first (P1) and second (P2) stable position of the flange are arranged on opposite sides of a plane F parallel to the plane A of the opening.
4. The arrangement according to claim 1, wherein the container wall has an edge (17; 27; 37) surrounding the opening, said edge is substantially flat and parallel to the plane A or rounded, said edge is intended to be in contact with the surface (45; 55) of the lid

(40, 50) that is facing the container.

5. The arrangement according to claim 4, wherein the distance S between the surface (45; 55) of the lid that is in contact with the edge (17; 27; 37) of the container and the shoulder (43; 53) on the collar (42; 52) is equal or less than the vertical distance E between the edge (17; 27; 37) of the container and the second stable position (P2) of the bistable flange if the flange is extending from the container wall.
6. The arrangement according to claim 5, wherein the distance S is larger than the distance between the plane F and the first stable position (P1) of the flange (13; 23; 33), and less than the distance between the edge (17; 27; 37) and the second stable position (P2) to ensure that the lid is maintained in contact with the edge (17; 27; 37) of the container wall.
7. The arrangement according to anyone of the previous claims, wherein the angle (α) between the first (P1) and second (P2) stable position of the flange is within the range of 60° to 135°.
8. The arrangement according to anyone of the previous claims, wherein the container opening (12; 22; 32) and the lid (40; 50) are substantially circular.
9. The arrangement according to anyone of the previous claims, wherein at least the flange (13; 23; 33) is made of an elastic material able to withstand repeated deformations without breaking.
10. The arrangement according to anyone of the previous claims, wherein the lid (40; 50) has a substantially flat circular central section (41; 51).
11. The arrangement according to claim 10, wherein the flat circular central section (51) is formed by a folie with a thickness between 50 μm and 500 μm .
12. The arrangement according to anyone of the previous claims, wherein the flange (13; 23; 33) is arranged on the container (10; 20; 30) and the shoulder (43; 53) on the collar (42; 52) of the lid.
13. The arrangement according to claim 12, wherein the outer diameter of the flange is exceeding the inner diameter of the shoulder.
14. The arrangement according to anyone of the previous claims, wherein the flange comprises a flange base (24; 34; 44) secured to, or formed together with the container wall or collar, and a flange protrusion (25; 35; 45) extending from said flange base.
15. The arrangement according to claim 14, wherein the flange protrusion (25; 35; 45) has a substantially con-

stant thickness and a rounded outer end (26; 36; 46).

- 16.** The arrangement according to claim 14 or 15, wherein the thickness of the flange base is smaller than the tickness of the flange protrusion.

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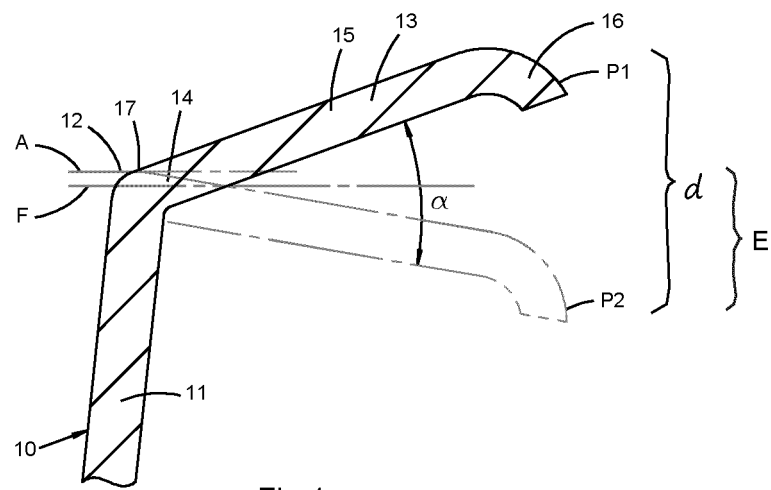


Fig 1a

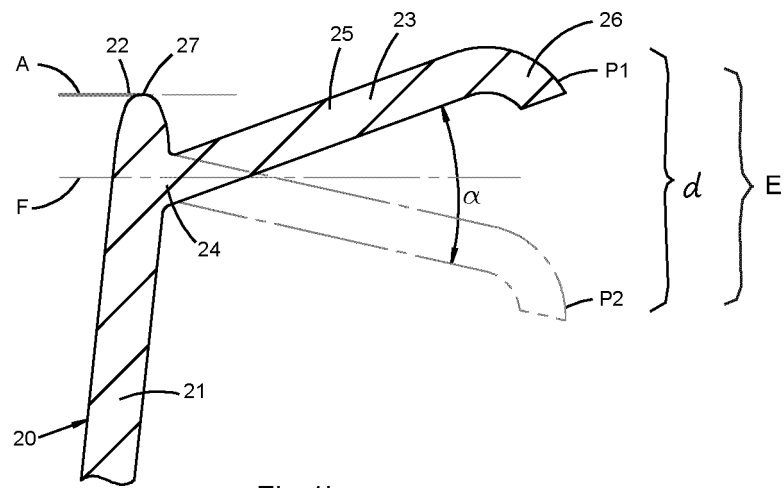
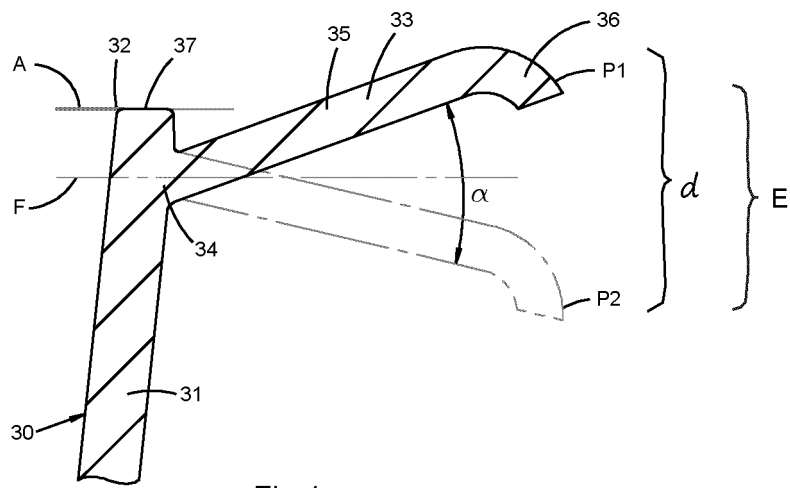


Fig 1b



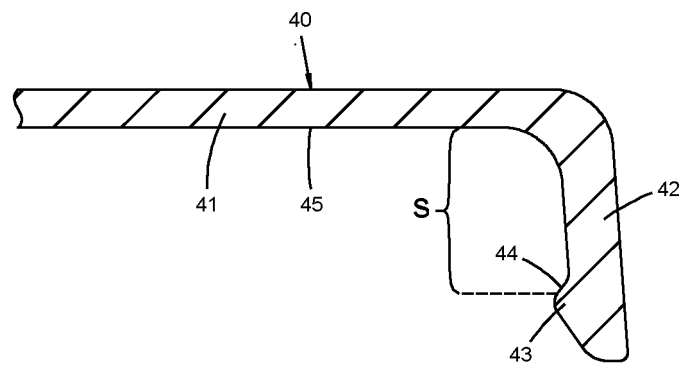


Fig 2a

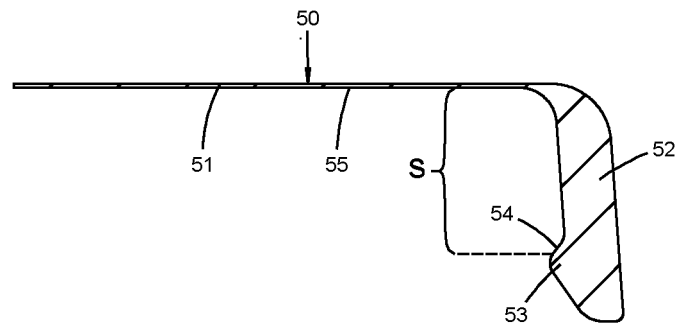


Fig 2b

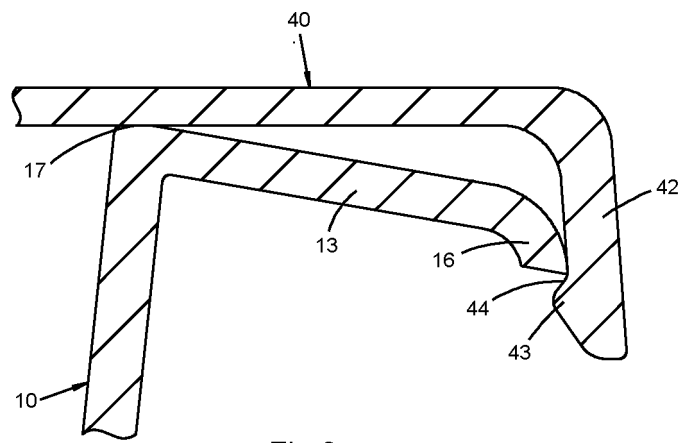


Fig 3



EUROPEAN SEARCH REPORT

Application Number
EP 12 19 3577

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	WO 2005/095220 A1 (ICI PLC [GB]; PEACOP ALEXANDER JAMES [GB]; BUNCE MARTIN CHRISTOPHER [G]) 13 October 2005 (2005-10-13) * page 3, line 13 - page 4, line 18; figures *	1	INV. B65D43/02
A	FR 2 175 132 A1 (SUPERFOS EMBALLAGE AS [DK]) 19 October 1973 (1973-10-19) * page 3, line 27 - page 5, line 31; figures 1,3,4 *	1	
A	US 5 452 818 A (YOST KENNETH J [US]) 26 September 1995 (1995-09-26) * column 3, line 15 - column 4, line 59; figures *	1	
A	US 2011/315650 A1 (HORTON TOMAS C [US] ET AL) 29 December 2011 (2011-12-29) * paragraph [0032] - paragraph [0033] * * paragraph [0036] - paragraph [0039]; figures 4,5 *	1	TECHNICAL FIELDS SEARCHED (IPC)
A	US 3 424 342 A (SCOPP ET AL) 28 January 1969 (1969-01-28) * column 2, line 40 - column 3, line 39; figures *	1	B65D
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 20 March 2013	Examiner Newell, Philip
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 12 19 3577

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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20-03-2013

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2005095220 A1	13-10-2005	AR 049013 A1	21-06-2006
		AT 399131 T	15-07-2008
		CA 2562120 A1	13-10-2005
		EP 1732819 A1	20-12-2006
		ES 2309724 T3	16-12-2008
		MY 139417 A	30-09-2009
		PT 1732819 E	31-07-2008
		US 2008230507 A1	25-09-2008
		UY 28834 A1	31-10-2005
		WO 2005095220 A1	13-10-2005
FR 2175132 A1	19-10-1973	BE 842171 A7	16-09-1976
		CA 1008403 A1	12-04-1977
		DK 132878 B	23-02-1976
		FI 53431 B	31-01-1978
		FR 2175132 A1	19-10-1973
		GB 1408821 A	08-10-1975
		NO 134651 B	16-08-1976
		SE 386423 B	09-08-1976
US 5452818 A	26-09-1995	NONE	
US 2011315650 A1	29-12-2011	CA 2791809 A1	12-01-2012
		CN 102791589 A	21-11-2012
		EP 2534062 A1	19-12-2012
		SG 183539 A1	30-10-2012
		TW 201208949 A	01-03-2012
		US 2011315650 A1	29-12-2011
		WO 2012005950 A1	12-01-2012
US 3424342 A	28-01-1969	NONE	

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 2194002 A [0003]