(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
13 December 2012 (13.12.2012)

WIPO | PCT

(10) International Publication Number
WO 2012/169883 A1

(51) International Patent Classification:
B65D 79/00 (2006.01) *B65D 51/16* (2006.01)
B65D 81/20 (2006.01)

(21) International Application Number:
PCT/NL2012/050389

(22) International Filing Date:
4 June 2012 (04.06.2012)

(25) Filing Language: Dutch

(26) Publication Language: English

(30) Priority Data:
2006900 6 June 2011 (06.06.2011) NL

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(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report (Art. 21(3))*

(54) **Title**: LID FOR VACUUM PACKAGING AND METHOD FOR PRODUCING THE LID

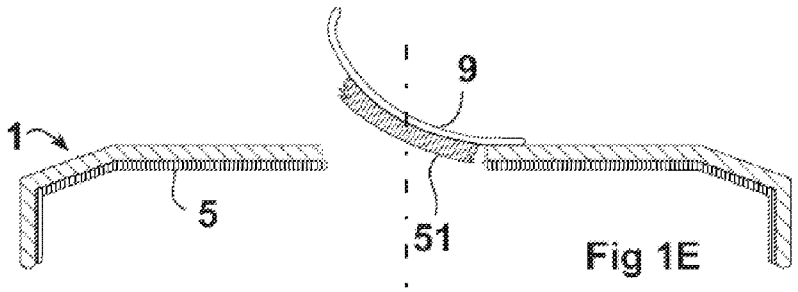

Fig 1E

(57) **Abstract**: In a first step of the method, a prefabricated lid (1) is provided. The prefab lid has an outer and an inner side (2, 3). The lid has a continuous vent hole (4). The prefab lid is devoid of a protective finishing layer on the inner side of the lid. In a following step of the method, on the outer side of the lid a closure element (9) is fitted over the vent hole in the lid. In another step of the method, a protective finishing layer (5) is applied to the inner side of the lid, wherein the protective finishing layer closes off the vent hole and covers substantially the whole of the inner side. The protective finishing layer and the closure element are placed such that the protective finishing layer forms a connection with the closure element. By virtue of the connection, the removal of the closure element results in the breaching of the protective finishing layer.

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Title: Lid for vacuum packaging and method for producing the lid

The present invention relates to a lid for vacuum packaging and a method for producing the lid.

US20060249475 describes a lid for a product holder. In this lid is provided a small hole, which can be closed off in an airtight manner with a sticker. In the product holder, a product can be preserved under vacuum. The vacuum can be released by pulling the sticker off the lid. Following the removal of the sticker, the lid can be easily removed by hand.

One problem with the lid is that the product, via the small hole, can come into contact with the sticker. In order to prevent harming of the product, the sticker and the glue should be of a special type. Another problem is that the lid, at the site of the small hole, is prone to oxidization. The walls which form the small hole can oxidize.

US5.439.724 shows a closure of a small hole in a lid, wherein to an inner side of the lid is fitted a sealing plug, which is later connected to a sticker on the outer side of the lid. A problem with this is that, following the removal of the sticker, the plug falls into the product. This can be very dangerous, especially if the product concerns a foodstuff.

US20110049159 describes a lid for vacuum packaging, wherein an auxiliary tool is necessary to release the vacuum. With the auxiliary tool, a vent hole must be made in the lid. A disadvantage of this is that, in the absence of the auxiliary tool, the lid is difficult to open.

The object of the present invention is to at least partially remedy at least one of the above-stated drawbacks, or to provide a usable alternative. In particular, the object of the invention is to provide a lid with which vacuum in a product holder can be easily released and wherein the lid meets stringent requirements with regard to protection of the product in the product holder.

The object is achieved by a method for producing a lid, as defined in claim 1.

In a first step of the method according to the invention, a prefabricated lid, a prefab lid, is provided. The prefab lid has an outer and an inner side. The lid has a continuous vent hole extending from the outer side to the inner side. The prefab lid is devoid of a protective finishing layer, in particular a sanitary layer, on the inner side of the lid. In a following step of the method according to the invention, on the outer side of the lid a closure element is fitted over the vent hole in the lid. In another step of the method according to the invention, a protective finishing layer is applied to the inner side of the lid, wherein the protective finishing layer closes off the vent hole and covers substantially the whole of the inner side. The protective finishing layer and the closure element are placed such that the protective finishing layer forms a connection with the closure element. By virtue of the connection, the removal of the closure element results in the breaching of the protective finishing layer.

One advantage of the method is that the protective finishing layer on the inner side of the lid fully closes off the closure element from the inner side. A product, for example a foodstuff, can no longer come into contact with the closure element via the vent hole. This

has the advantage that the risk of contaminants on the closure element, for example in the adhesive layer, harming the product is small. It is an advantage that the closure element and the adhesive layer need to meet less stringent food safety requirements.

It is also advantageous that the vent hole is closed off. The walls of the vent hole are closed off by the protective finishing layer, so that the risk of corrosion of the vent hole is small.

One advantage of the protective layer is that this covers substantially the whole of the inner side. Substantially here denotes that the inner side is more than 90% covered. One advantage is that the protective layer can be designed flat and without grooves or edges, such that the lid is less prone to dirt contamination. Another advantage of the flat protective layer is that the risk that a part or portion of the protective layer ends up in the product upon the removal of the closure element can be discounted.

One advantage of the obtained lid is that the vent hole can be reclosable with the aid of the closure element. A product in a product holder closed with the lid can hence be better preserved.

In one embodiment of the method according to the invention, the protective finishing layer is applied to the inner side after the closure element has been fitted to the outer side of the closure element, wherein the protective finishing layer forms a connection with the closure element, such that a removal of the closure element results in a breach of the protective finishing layer.

One advantage of this embodiment is that the protective finishing layer can be a thin coating. After the closure element has been fitted over the vent hole, the inner side of the lid is a fully closed surface, so that the thin coating can be applied over the closed surface.

In an alternative embodiment of the method according to the invention, the closure element is fitted to the outer side after the protective finishing layer has been applied to the inner side of the closure element, wherein the closure element forms a connection with the protective finishing layer, such that a removal of the closure element results in a breach of the protective finishing layer.

In one embodiment of the method according to the invention, a lid having at least two vent holes is provided. The method next comprises, in order to remove the lid from a product holder, a step of engaging a spanner tool in the at least two vent holes of the lid for the twisting of the lid. The design of the spanner tool will be expounded upon later.

The invention further relates to a lid for the airtight closure of a product in a product holder. The lid is suitable for a vacuum packaging. The lid has an inner and an outer side, wherein the lid, from the outer side, has a vent hole which on the outer side is closed off with a closure element and on the inner side is closed off with a protective finishing layer which covers substantially the whole of the inner side, and wherein the closure element is connected to the protective finishing layer, such that a removal of the closure element results in a breach of the protective finishing layer.

The advantages of the lid according to the invention correspond with the above-stated advantages of the method according to the invention.

In one embodiment of the lid according to the invention, the closure element is plate-shaped and the lid comprises an adhesive layer. An adhesive layer is, for example, a layer of glue. Preferably, the adhesive layer is stronger than the protective finishing layer. Preferably, the bonding of the adhesive layer to the protective finishing layer is stronger than the breaking force of the protective finishing layer. If the protective finishing layer is bonded to the adhesive layer, the protective finishing layer, upon the removal of the closure element, will break, whereby the vent hole is opened. Advantageously, as a result of the bonding, no residues of the protective finishing layer can become detached and mix with a product held in the product holder. One advantage of an adhesive layer is that the lid can be reclosable. Preferably, the lid is made of metal, in particular of tin plate. The tin-plated lid is fully finished with a finishing layer.

In an alternative embodiment of the lid according to the invention, the closure element is devoid of an adhesive layer. In particular, the closure element, in a region covering the vent hole of the lid, is devoid of an adhesive layer. That region of the closure element which lies in contact with the outer side of the lid around the vent hole can be provided with an adhesive layer to enable reclosability. The region provided with an adhesive layer is preferably annular, wherein the internal adhesive-layer-free region covers the vent hole. The lid comprises a closure element which, by the protective finishing layer on the inner side, is connected to the outer side of the lid. In the method for producing the lid according to the invention, the application of the protective finishing layer ensures a firm connection of the closure element with the lid. In the method, the closure element can be positioned loosely against the prefab lid, after which the closure element is bonded in place by the application of the protective finishing layer.

In one embodiment of the lid according to the invention, the closure element is an information carrier, wherein visible information, for example a brand name, is provided on a side facing away from the adhesive layer.

In one embodiment of the lid according to the invention, the lid comprises at least two vent holes. The at least two vent holes can be covered with at least one closure element.

In one embodiment of the lid according to the invention, the lid further comprises a spanner tool for twisting the lid with respect to a product holder. The spanner tool is elongate, wherein the long length defines a longitudinal direction and has a handle and a tool head at a distal end. The tool head has at lest two mutually adjacent projections The projections extend in a direction transversely to the longitudinal direction. The projections can be inserted into the at least two vent holes of the lid, such that a twisting of the spanner tool results in a twisting of the lid.

In one embodiment of the lid according to the invention, the lid comprises a complementary product holder, in particular a preserve jar, which is provided for the holding

of a product, in particular a foodstuff, wherein the lid and the complementary product holder form an assembly.

In one embodiment of the lid according to the invention, the lid is connectable to the product holder by means of a screw connection.

In one embodiment of the lid according to the invention, the lid comprises a deformable part for the deformation resulting from a pressure change between the outer and inner side of the lid.

Further preferred embodiments are defined in the other sub-claims.

The invention further relates to an assembly of a lid and a product holder.

The invention will be explained in greater detail with reference to the appended drawings. The drawings form a practical embodiment of the invention, which should not be regarded in a limiting sense. Specific detailed features can also be regarded in isolation from the illustrative embodiment, in a general sense, as characteristic of the invention, wherein:

Fig. 1 represents a series of diagrams showing successive steps of a method for producing a lid according to the invention;

Fig. 2 shows a cross-sectional view of a lid with vent hole, wherein a protective finishing layer is applied to an inner side of the lid.

Fig. 1 shows in a series of diagrams the production of a lid according to the invention. In the diagrams, a lid is respectively shown in cross section.

In Fig. 1A, a lid 1 is shown in cross section. The lid 1 is circular and has a circumferential rim. The circumferential rim can engage on a product holder (not shown) for the holding of a product, for example a foodstuff. The product holder is in particular a glass jar, a preserve jar. The circumferential rim can comprise inwardly directed grooves for obtaining a screw connection with a corresponding circumferential rim of the product holder.

The lid 1 is produced from a plate material. The lid 1 is produced from metal plate. The lid 1 is produced by a deep-drawing process. The lid 1 has an outer side 2 and an inner side 3. The outer side 2 relates to the external, or the top side, of the lid 1. The inner side 3 relates to the inside of the lid 1. The outer side 2 of the lid 1 can be provided with an external coating. The external coating protects the lid 1 against corrosion. The inner side 3 of the lid 1 is devoid of a protective finishing layer as the finishing layer. According to the invention, after a vent hole has been made, the inner side 3 of the lid 1 should be finished with a protective finishing layer.

In Fig. 1B is shown the lid 1, wherein a vent hole 4 is made in the lid 1. The vent hole 4 is placed centrally in the lid 1. The vent hole 4 extends from the outer side 2 to the inner side 3. The vent hole 4 is continuous. The vent hole 4 here has a round shape. All sorts of shapes are possible, including rectangular, for example.

Fig. 1A shows with Fig. 1B a first step of the method according to the invention, namely the procurement of a lid 1, wherein the lid 1 has an outer and an inner side 3,

wherein the lid 1 has a continuous vent hole 4 extending from the outer side 2 to the inner side 3, and wherein a protective finishing layer, in particular a sanitary layer, on the inner side of the 3 of the lid 1 is absent.

In Fig. 1C is shown the lid 1, wherein a closure element 9 is fitted over the vent hole 4. The closure element 9 is fitted to the outer side 2. The closure element 9 is plate-shaped and has an adhesive layer for obtaining a bonding of the closure element 9 onto the outer side 2 of the lid 1. The adhesive layer is a layer comprising an adhesive agent, for example glue.

In Fig. 1D is shown the lid 1, wherein the lid 1, on the inner side 3, is provided with a protective finishing layer. The protective finishing layer covers substantially the whole of the inner side 3 of the lid 1. The protective finishing layer covers the bottom side of the lid 1, inclusive of an inner edge of the circumferential rim. The protective finishing layer closes off the vent hole 4. The protective finishing layer covers the bottom side of the closure element 9, such that the closure element 9 is no longer exposed from below. As a result of the presence of the protective finishing layer, a product in the product holder can no longer come into contact with the bottom side of the closure element 9. The product can no longer come into contact with the adhesive layer of the closure element 9. The risk of contamination or spoiling of the product is hereby drastically reduced.

As represented in Figs. 1C and 1D, the closure element 9 is partially, in a region adjoining the circumferential rim of the closure element 9, devoid of the adhesive agent. As a result, the closure element 9 does not bond locally to the lid 1. The closure element 9 has a lip, which does not bond to the lid 1. With the aid of the lip, the closure element 9 can be pulled from the lid 1 easily by hand and without auxiliary tools.

In Fig. 1E, the detachment of the closure element 9 from the lid 1 is shown. If the closure element 9 is pulled off from the lid 1, the protective finishing layer on the inner side 3 of the lid 1 will be torn off. As a result, the vent hole 4 will be opened and a pressure difference which is present between the outer side 2 and inner side 3 of the lid 1 will be eliminated. The vent hole 4 has a diameter of at least 0.5 mm, in particular at least 2 mm, and preferably at least 5 mm. The size of the vent hole guarantees a connection between the closure element 9 and the protective finishing layer 5.

In the series of diagrams of Fig. 1 is shown that the protective finishing layer is applied to the inner side 3 after the closure element 9 has been fitted to the outer side 2 of the closure element 9, wherein the protective finishing layer forms a connection with the closure element 9, such that a removal of the closure element 9 results in a breach of the protective finishing layer.

In an alternative embodiment of the method, it is possible to fit the closure element 9 to the outer side 2 after the protective finishing layer 5 has been applied to the inner side 3 of the lid, wherein the closure element 9 bonds with the protective finishing layer, such that a removal of the closure element 9 results in a breach of the protective finishing layer. Fig. 2

shows a lid 1 having a vent hole 4, wherein a protective finishing layer has been applied over substantially the whole of the inner side 3 of the lid 1 before a closure element 9 has been fitted over the vent element on the outer side 2 of the lid 1. In the series of diagrams of Fig. 1, Fig. 1C can be replaced by the diagram of Fig. 2 so as to represent the method in this alternative embodiment.

In addition to the embodiments shown in the figures, many variants are possible. The protective finishing layer can be a sanitary layer for the preservation of foodstuffs. The protective finishing layer can also be a chemically resistant layer for the storage of chemicals.

In a variant of the shown embodiment of the lid in which a vent hole 4 is shown centrally in the lid, in an alternative embodiment a non-central vent hole 4 can be provided. In a variant, a plurality of vent holes can be provided in a lid.

The invention thus provides a lid and a method for producing a lid, which lid is simple to use and wherein the risk of harming a product under the lid is minimalized.

CLAIMS

1. Method for producing a lid (1), in particular for use with foodstuffs, comprising the steps of:
- providing of a semi-manufactured lid (1), wherein the lid has an outer and an inner side (2, 3), wherein the lid has a continuous vent hole (4) extending from the outer side to the inner side, wherein the lid is devoid of a protective finishing layer on the inner side of the lid;
- placing of a closure element (9), on the outer side (2) of the lid, over the vent hole (4) in the lid;
- applying of a protective finishing layer (5) to the inner side of the lid, wherein the protective finishing layer closes off the vent hole (4) and covers substantially the whole of the inner side,
wherein the protective finishing layer (5) and the closure element (9) are placed such that the protective finishing layer (5) forms a connection with the closure element (9), wherein, by virtue of the connection, the removal of the closure element (9) results in the breach of the protective finishing layer (5).

2. Method according to claim 1, wherein the protective finishing layer (5) is applied to the inner side after the closure element (9, Fig. 1C) has been fitted to the outer side of the lid, wherein the protective finishing layer (5) forms a connection with the closure element (9), such that a removal of the closure element (9) results in a breach of the protective finishing layer (5).

3. Method according to claim 1, wherein the closure element (9) is fitted to the outer side after the protective finishing layer (5, Fig. 2) has been applied to the inner side of the lid, wherein the closure element forms a connection with the protective finishing layer, such that a removal of the closure element results in a breach of the protective finishing layer.

4. Method according to one of claims 1-3, wherein a lid having at least two vent holes (4) is provided, wherein the method comprises a step of engaging a spanner tool in the at least two vent holes of the lid for the twisting of the lid.

5. Lid (1) for the airtight closure of a product in a product holder, wherein the lid has an inner and an outer side (2, 3), wherein the lid has a vent hole (4), which on the outer side (2) is closed off with a closure element (9) and on the inner side (3) is closed off with a protective finishing layer (5) which covers substantially the whole of the inner side, and wherein the closure element (9) is connected to the protective finishing layer (5), such that a removal of the closure element (9) results in a breach of the protective finishing layer.

6. Lid (1) according to claim 5, wherein the closure element is plate-shaped and comprises an adhesive layer.

7. Lid (1) according to claim 5, wherein the closure element is plate-shaped and has a contact surface for bearing contact onto the lid, wherein the contact surface has a region which is devoid of an adhesive layer, and wherein the closure element is connected to the lid by a bonding of the protective finishing layer with the closure element.

8. Lid (1) according to claims 5-7, wherein the closure element is an information carrier, wherein visible information is provided on a side facing away from the adhesive layer.

9. Lid (1) according to one of claims 5-8, wherein at least two continuous vent holes are provided in the lid.

10. Lid (1) according to claim 9, wherein the lid further comprises a spanner tool for twisting the lid with respect to a product holder, wherein the spanner tool is elongate and has a handle and comprises a tool head, and wherein the tool head has at least two mutually adjacent projections, which can be inserted into the at least two continuous vent holes of the lid, such that a twisting of the spanner tool results in a twisting of the lid.

11. Lid (1) according to one of claims 5-10, wherein the lid comprises a complementary product holder, in particular a preserve jar, which is provided for the holding of a product, in particular a food stuff, wherein the lid and the complementary product holder form an assembly.

12. Lid (1) according to claim 11, wherein the lid is connectable to the product holder by means of a screw connection.

13. Lid (1) according to one of claims 5-12, wherein the lid has a deformable part for the deformation resulting from a pressure change between the outer and inner side.

14. Assembly, in particular a preserve jar, comprising a lid according to one of claims 5-10, and a product holder complementary thereto.

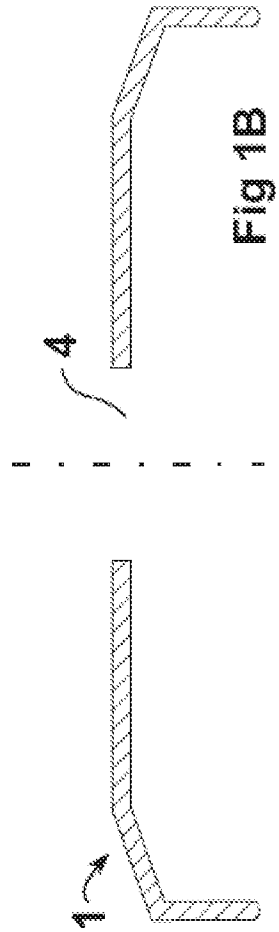

Fig 1B

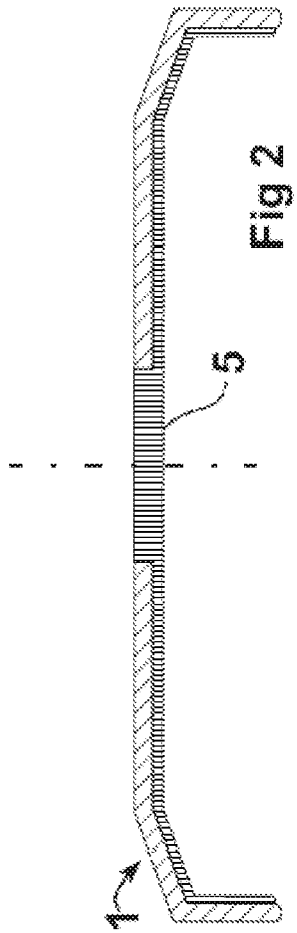

Fig 2

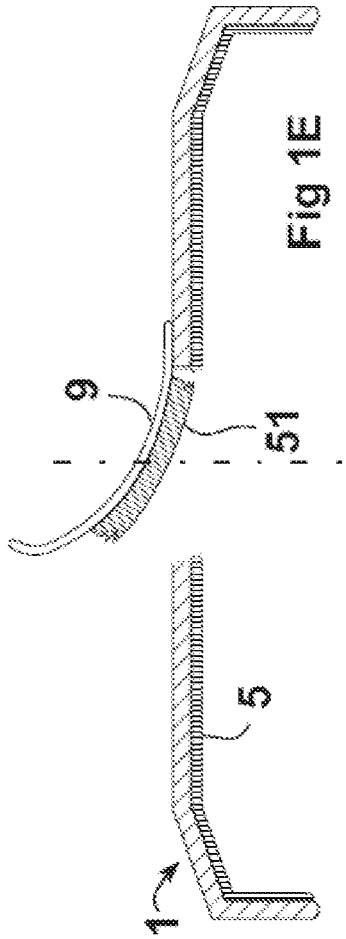

Fig 1E

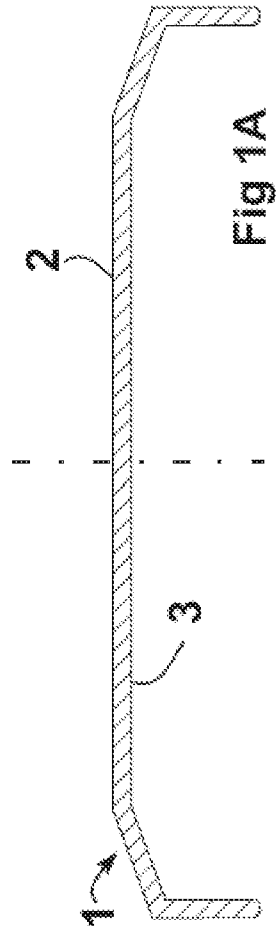

Fig 1A

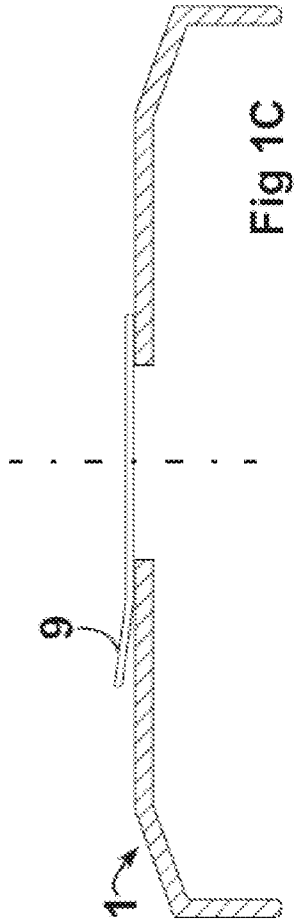

Fig 1C

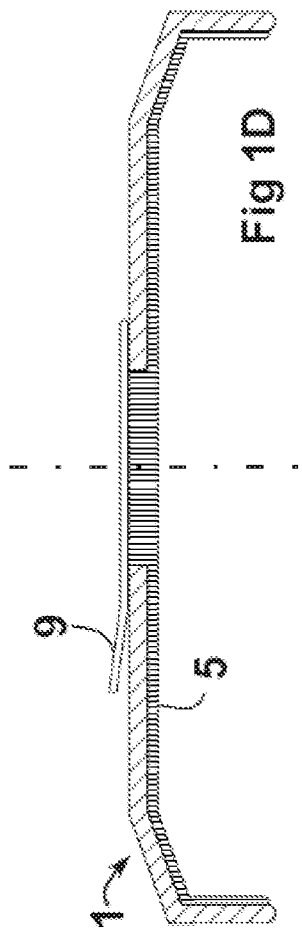

Fig 1D

INTERNATIONAL SEARCH REPORT

International application No
PCT/NL2012/050389

A. CLASSIFICATION OF SUBJECT MATTER
INV. B65D79/00 B65D81/20 B65D51/16
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 881 159 A1 (OPTIMAL FOOD PROCESSING RESEAR [US] OPTIMAL FOOD PROC RES INC [US]) 2 December 1998 (1998-12-02) column 5, line 28 - line 49; figure 3	1,5
A	US 5 647 500 A (KONNO HIDETOSHI [JP] ET AL) 15 July 1997 (1997-07-15) column 3, line 17 - line 55; figures 1c-3b	1,5

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
6 September 2012	14/09/2012

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Bridault, Alain

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/NL2012/050389

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