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- **Park, Kwang-Soo**
Gyeonggi-do (KR)
- **Jo, Kyoung-Sik**
Seoul (KR)
- **Rhyu, Ki-Min**
Seoul (KR)

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(74) Representative: **Walaski, Jan Filip**
Venner Shipley LLP
20 Little Britain
London
EC1A 7DH (GB)

(71) Applicant: **CJ Cheiljedang Corporation**
Jung-gu
Seoul 100-400 (KR)

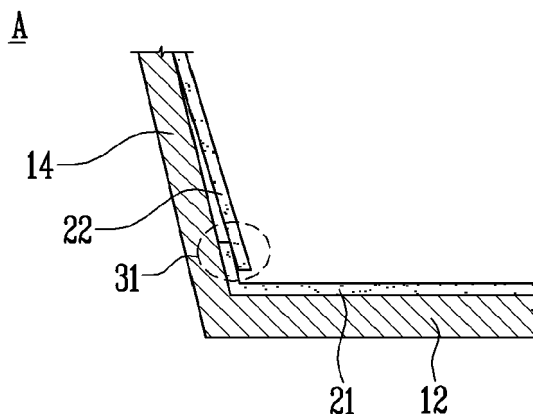
(72) Inventors:
• **Cha, Gu-Hoan**
Seoul (KR)

(54) **Food storage container**

(57) Disclosed is a food storage container including a container body (10) including a bottom part (12) and a lateral part (14) to form an interior space (16), a bottom film (21) attached to the bottom part (12), and a lateral film (22) forming a first overlapping part where the lateral

film (22) overlaps with the bottom film (21) and a second overlapping part where an end portion overlaps with another end portion, and being attached to the lateral part (14). The food storage container has an improved film structure as compared with a conventional complicated film structure and has a high oxygen barrier performance.

FIG. 2A



Description

[0001] The invention relates to a food storage container, and more particularly, to a food storage container which has an improved film structure as compared with a conventional complicated film structure and has a high oxygen barrier performance.

[0002] There are various types of retort pouches on the market. Generally, a retort pouch is to preserve food for a long time, being blocked from air and light, and is manufactured as follows: cooked and processed food is sealed into a container, followed by heating and sterilization at a high temperature via a retort sterilization process. The retort sterilization process includes a high-retort sterilization, performed at 125°C or more, a standard retort sterilization, performed at 121°C, a semi-retort sterilization, performed around 110°C, and the like. In addition to the retort sterilization process, there are used various methods, such as a heating sterilization of sterilizing with heat of 100°C or less for a predetermined period of time, a hot-filling in which contents are sterilized at a high temperature and sealed in a container, or the like. Further, non-sterilization is performed on products which do not need sterilizing.

[0003] In order to preserve food sterilized through the above processes or non-sterilized for a long time, a food storage container has a high oxygen barrier performance. Conventionally, in order to have a high oxygen barrier performance, a film having a high barrier performance is in-molded on an outside of the container, but a portion, such as a corner of the container, may not be in-molded to reduce oxygen barrier performance.

[0004] Further, a method of providing oxygen barrier performance to a container using injection resin having a high barrier performance is used, but the injection resin is expensive, and oxygen barrier performance decreases when the resin having the high barrier performance is not uniformly distributed.

[0005] In addition, there are more methods, such as a method that a high barrier performance sheet is thermally molded into a container shape and inserted into an injection container, a method of inserting a film into an inside of a container and injecting, a method of thermally molding a high barrier performance sheet of ethylene vinyl alcohol (EVOH) or MXD-6, or the like.

[0006] In the method that the high barrier performance sheet is thermally molded into the container shape and inserted into the injection container, thermally molding the high barrier performance sheet and injection are separately performed to bring about a complicated process, and an entire thickness of the container becomes thick due to the thermally molded sheet.

[0007] In the method of inserting the film into the inside of the container and injecting, the film has a complicated structure so that a vacuum is not formed when the film is attached to the container, and thus a manufacturing process is difficult. Moreover, since the film is shaped in advance and inserted, an additional manufacturing process is needed.

[0008] In the thermally molded container of EVOH or MXD-6, oxygen barrier performance decreases in a sterilization process and is not uniform depending on a difference in thickness of the container to reduce an expiration data.

[0009] An aspect of the present invention is to provide a food storage container in which a film to be attached to an inside of the container is divided into two sheets and attached, so that a conventional complicated film structure is improved, a process of shaping the film is not necessary, and manufacturing costs are reduced.

[0010] Further, an aspect of the present invention is to provide a food storage container in which a film forms a first overlapping part and a second overlapping part to be closely attached to an inside of the container although the film is divided into two sheets, so that oxygen barrier performance is improved to preserve food in the container for a long time.

[0011] According to an aspect of the present invention, there is provided a food storage container including a container body including a bottom part and a lateral part to form an interior space, a bottom film attached to the bottom part, and a lateral film forming a first overlapping part where the lateral film overlaps with the bottom film and a second overlapping part where an end portion overlaps with another end portion, and being attached to the lateral part.

[0012] The container body may be integrated with the respective films by insert molding.

[0013] The bottom film and the lateral film each may include a lower layer formed of polypropylene (PP), at least one oxygen barrier resin layer disposed on the lower layer, and an upper layer disposed on the oxygen barrier resin layer and formed of PP.

[0014] The oxygen barrier resin layer may include polyethylene terephthalate (PET).

[0015] The bottom film and the lateral film each may further include an opaque layer disposed between the lower layer and the oxygen barrier resin layer and formed of opaque PP or opaque PET.

[0016] The container body may further include a flange extending outwards from an upper portion of the lateral part, the lateral film may be attached to an upper surface of the flange as well as to the lateral part, and the food storage container may further include a cover film attached to the lateral film on the upper surface of the flange.

[0017] The cover film may include a lower layer formed of PP, at least one oxygen barrier resin layer disposed on the lower layer, and an upper layer disposed on the oxygen barrier resin layer and formed of PP.

[0018] The oxygen barrier resin layer may include PET.

[0019] The oxygen barrier resin layer may have an oxygen transmission rate of 0.07 cc/m²·day·atm to 0.09 cc/m²·day·atm.

[0020] Display information may be printed on a lower surface of the opaque layer.

[0021] As described above, exemplary embodiments of the present invention provides a food storage container in which a film to be attached to an inside of the container is divided into two sheets and attached, so that a conventional complicated film structure is improved, a process of shaping the film is not necessary, and manufacturing costs are reduced.

[0022] Further, exemplary embodiments of the present invention provide a food storage container in which a film forms a first overlapping part and a second overlapping part to be closely attached to an inside of the container although the film is divided into two sheets, so that oxygen barrier performance is improved to preserve food in the container for a long time.

[0023] The accompanying drawings, together with the specification, illustrate exemplary embodiments of the present invention, and, together with the description, serve to explain the principles of the present invention.

FIG. 1 is a cross-sectional view of a food storage container according to an exemplary embodiment of the present invention;

FIG. 2A is an enlarged view of a part A of FIG. 1;

FIG. 2B illustrates a first overlapping part;

FIGS. 3A and 3B illustrate a second overlapping part;

FIG. 4 is a cross-sectional view of a bottom film and a lateral film; and

FIG. 5 is a cross-sectional view of the food storage container further including a flange.

[0024] Reference will now be made in detail to exemplary embodiments of the present invention, examples of which are illustrated in the accompanying drawings, wherein like reference numerals refer to like elements throughout. The embodiments are described below in order to explain the present invention by referring to the figures. This invention may, however, be embodied in many different forms and should not be construed as limited to the exemplary embodiments set forth herein. Rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art. In the drawings, the size and relative sizes of layers and regions may be exaggerated for clarity.

[0025] Hereinafter, the present invention will be described in detail with reference to the accompanying drawings illustrating a food storage container according to exemplary embodiments.

[0026] FIG. 1 is a cross-sectional view of a food storage container according to an exemplary embodiment of the present invention.

[0027] Referring to FIG. 1, the food storage container according to the present embodiment includes a container body 10, a bottom film 21, and a lateral film 22.

[0028] The container body 10 forms an interior space 16 in which preserved food is put, and includes a bottom part 12 and a lateral part 14 to form the interior space 16 which is open upwards.

[0029] The bottom part 12 may be formed in a plate shape and may be slightly modified, for example, bent, grooved, or the like.

[0030] The lateral part 14 is formed to extend upwards from an edge of the bottom part 12 and functions to close a lateral side of the container body 10.

[0031] The bottom film 21 is attached to the bottom part 12 on an upper side of the bottom part 12, as shown in FIG. 1.

[0032] The lateral film 22 is attached to the lateral part 14 on an internal side of the lateral part 14, as shown in FIG. 1.

[0033] The bottom film 21 and the lateral film 22 form a first overlapping part and a second overlapping part to eliminate a portion where the films are not attached in the container body 10.

[0034] The container body 10 may be formed of synthetic resins, such as transparent plastic, and is integrated with the bottom film 21 and the lateral film 22 by a film insert molding.

[0035] The film insert molding is a process that by inserting a preformed film into a mold before injection molding, the film and a molded part are integrated into a product, simultaneously with injection.

[0036] FIG. 2A is an enlarged view of a part A of FIG. 1, FIG. 2B illustrates the first overlapping part, and FIGS. 3A and 3B illustrate the second overlapping part. Hereinafter, the first overlapping part 31 and the second overlapping part 32 are described further with reference to FIGS. 2A to 3B.

[0037] First, the first overlapping part 31 is a portion where the lateral film 22 overlaps with the bottom film 21 and is formed to eliminate a vacuum, where the film is not attached, formed between the lateral film 22 and the bottom film 21.

[0038] Referring to FIG. 2A, the lateral film 22 is disposed over the bottom film 21, but the lateral film 22 may be disposed under the bottom film 21.

[0039] In FIG. 2A, a space formed between the bottom film 21 and the lateral part 14 is exaggerated for clarity. Practically, each film is very thin and is thermally attached to the inside of the container body 10, and thus the space due to the first overlapping part 31 is very small or the space may not exist.

[0040] Further, in FIGS. 2A and 2B, the first overlapping part 31 is formed on the lateral part 14 but may be formed

in different positions, such as around a corner between the bottom part 12 and the lateral part 14, on the bottom part 12, or the like.

[0041] Referring to Figures 3A and 3B, the second overlapping part 32 is a portion where the lateral film 22 overlaps with itself, that is, a portion where one end portion 221 of the lateral film 22 overlaps with another end portion 222.

[0042] The second overlapping part 32 is formed to closely cover the entire lateral part 14 without a vacuum being formed when the lateral film 22 is attached to the lateral side 14.

[0043] The first overlapping part 31 and the second overlapping part 32 are attached by heat in an injection molding process, wherein the bottom film 21 is thermally attached to the lateral film 22 in the first overlapping part 31, and the one end portion 221 is thermally attached to the other end portion 222 in the second overlapping part 32.

[0044] Thus, a film to be attached to the inside of the container body 10 is divided into two sheets to be attached to the bottom part 12 and the lateral part 14, respectively, thereby improving a conventional complicated film structure, not involving a manufacturing process of shaping a film, and reducing manufacturing costs.

[0045] Further, although the film is divided into two sheets, the first overlapping part 31 and the second overlapping part 32 are formed so that the film is closely attached to the inside of the container body 10. Accordingly, oxygen barrier performance is enhanced to preserve food in the container for a long time.

[0046] Although FIGS. 2B and 3B show the respective overlapping parts 31 and 32 being formed to be straight and having a regular width, a size and a shape of the respective overlapping parts 31 and 32 may be changed depending on a size and a shape of the respective films 21 and 22, a size and a shape of the container body 10, or the like.

[0047] FIG. 4 is a cross-sectional view of the bottom film and the lateral film.

[0048] Referring to FIG. 4, in the food storage container according to the exemplary embodiment, the bottom film 21 and the lateral film 22 each include a lower layer 51, an oxygen barrier resin layer 53, and an upper layer 54 which are sequentially disposed.

[0049] Further, the respective films 21 and 22 may further include an opaque, or opaque, layer 52 disposed between the lower layer 51 and the oxygen barrier resin layer 53. The opaque layer 52, which is opaque, is included to prevent a color of food in the container from being seen from the outside. The opaque layer 52 may be formed of, for example, ivory white polypropylene (PP) or ivory white polyethylene terephthalate (PET).

[0050] Display information may be printed on a lower surface of the opaque layer 52. The display information printed on the lower surface of the opaque layer 52 includes pictures and forms including patterns, designs, and characters, such as flowers and butterflies, product related information, such as barcodes and labels, letters, or the like, but is not limited thereto.

[0051] The display information is printed on an inside of a film to be insert-molded and is exposed to the outside through the container body 10, and thus damage which may occur when a sticker or label is attached to an outside of the container is prevented in designing the container.

[0052] Here, the lower layer 51 and the upper layer 54 may be formed of PP.

[0053] Further, the oxygen barrier resin layer 53 may be formed of PET. A plurality of oxygen barrier resin layers 53 may be included in the respective films 21 and 22 to improve oxygen barrier performance, and an oxygen transmission rate (OTR) may be 0.07 cc/ m².day-atm to 0.09 cc/ m².day.atm.

[0054] An OTR is measured on the container of the present invention and other containers using an oxygen permeation rate tester (OX-TRAN, a registered trademark, manufactured by MOCON, Inc.).

[0055] Experimental objects: A container of the present invention, a container having a general barrier film in-molded on an outside, a thermally molded container of ethylene vinyl alcohol (EVOH), and a thermally molded container of MXD-6, also referred to as Nylon-MXD6.

[0056] Experimental conditions: Contents (food) are put in an object container and retort-sterilized, after which an OTR is measured at 23°C and a relative humidity (RH) of 0% within 6 hours.

[0057] An OTR is measured as follows (cc/pkg/24h-atm).

[Table 1]

	Container of the present invention	General barrier film in-molded container	EVOH container	MXD-6 container
Before retort sterilization	0.002	0.8	0.004	0.005
After retort sterilization	0.003	1.0	0.12	0.03

[0058] As shown in Table 1, the container of the present invention has a lower OTR before retort sterilization than the other containers.

[0059] Further, the other containers have a considerably increased OTR after retort sterilization, while the container

of the present invention has a slightly increased OTR after retort sterilization.

[0060] Thus, the container of the present invention has an OTR before retort sterilization slightly different from the other containers, but has an OTR after retort sterilization considerably different from the other containers.

[0061] Accordingly, the container of the present invention still has a superior oxygen barrier performance after retort sterilization as compared with the other containers.

[0062] FIG. 5 is a cross-sectional view of the food storage container further including a flange.

[0063] Referring to FIG. 5, the container body 10 further includes a flange 18 extending outwards from an upper end portion of the lateral part 14.

[0064] The lateral film 22 is attached to an upper surface of the flange 18 as well as to the lateral part 14. That is, the lateral film 22 covering the lateral part 14 extends to the flange 18 to cover the upper surface of the flange 18. Here, the lateral film 22 may form the second overlapping part 32 on the upper surface of the flange 18 to closely cover the upper surface of the flange 18.

[0065] Thus, a cover film 60 is thermally attached to the lateral film 2, so that food in the container is thoroughly blocked from the outside due to the film having a high oxygen barrier performance.

[0066] The cover film 60 functions to seal the interior space of the container body 10 and is attached to the lateral film 22 disposed on the upper surface of the flange 18.

[0067] The cover film 60 may have the same configuration as the respective films 21 and 22 in order to prevent oxygen from permeating the container.

[0068] That is, the cover film 60 includes a lower layer 51 and an upper layer 54 which are formed of PP, and an oxygen barrier resin layer 53 disposed between the lower layer 51 and the upper layer 54.

[0069] Further, the oxygen barrier resin layer 53 may be formed of PET, and a plurality of oxygen barrier resin layers 53 may be included to improve oxygen barrier performance.

[0070] While the present invention has been described in connection with certain exemplary embodiments, it is to be understood that the invention is not limited to the disclosed embodiments, but, on the contrary, is intended to cover various modifications and equivalent arrangements included within the scope of the invention as defined in the appended claims.

Claims

1. A food storage container comprising:

a container body including a bottom part and a lateral part forming an interior space;

a bottom film attached to the bottom part; and

a lateral film forming a first overlapping part where the lateral film overlaps with the bottom film and a second overlapping part where end portions of the lateral film overlap with one another, the lateral film being attached to the lateral part.

2. The food storage container of claim 1, wherein the container body is integrated with the respective films by insert molding.

3. The food storage container of claim 1 or 2, wherein the bottom film and the lateral film each comprise:

a lower layer formed of polypropylene (PP);

at least one oxygen barrier resin layer disposed on the lower layer; and

an upper layer disposed on the oxygen barrier resin layer and formed of PP.

4. The food storage container of claim 3, wherein the oxygen barrier resin layer comprises polyethylene terephthalate (PET).

5. The food storage container of claim 3 or 4, wherein the bottom film and the lateral film each further comprise an opaque layer disposed between the lower layer and the oxygen barrier resin layer.

6. The food storage container of claim 5, wherein the opaque layer comprises ivory white PP or ivory white PET.

7. The food storage container of claim 5 or 6, wherein display information is printed on a lower surface of the opaque layer.

8. The food storage container of any one of the preceding claims, wherein the container body further comprises a flange extending outwards from an upper portion of the lateral part, wherein the lateral film is attached to an upper surface of the flange as well as to the lateral part, and the food storage container further comprises a cover film attached to the lateral film on the upper surface of the flange.

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9. The food storage container of claim 8, wherein the cover film comprises:

a lower layer formed of PP;

at least one oxygen barrier resin layer disposed on the lower layer; and

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an upper layer disposed on the oxygen barrier resin layer and formed of PP.

10. The food storage container of claim 9, wherein the oxygen barrier resin layer comprises PET.

11. The food storage container of claim 4 or 10, wherein the oxygen barrier resin layer has an oxygen transmission rate of 0.07 cc/m²·day·atm to 0.09 cc/m²·day·atm.

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FIG. 1

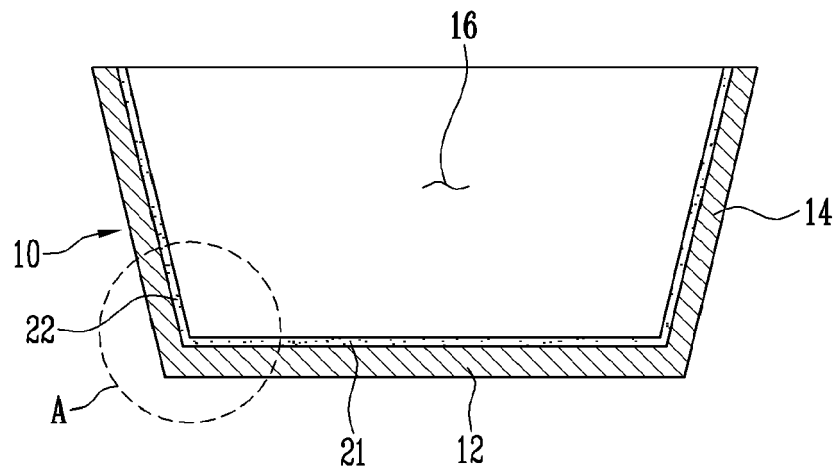


FIG. 2A

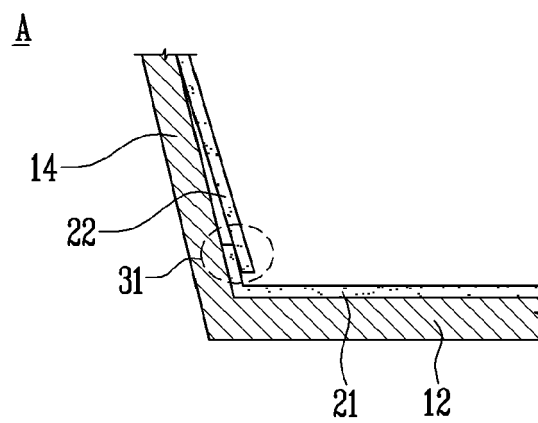


FIG. 2B

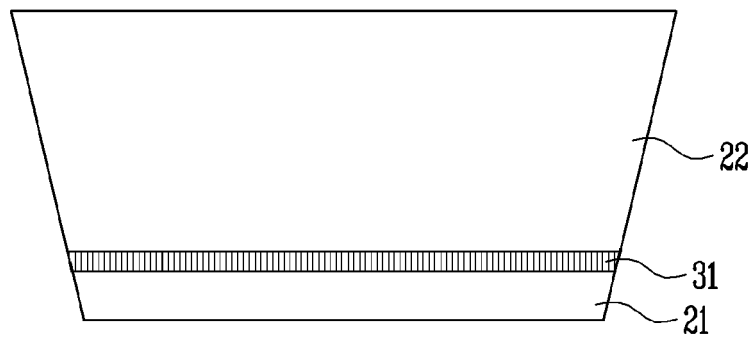


FIG. 3A

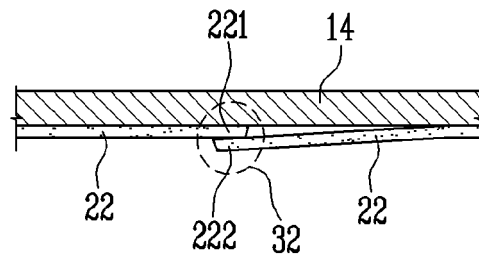


FIG. 3B

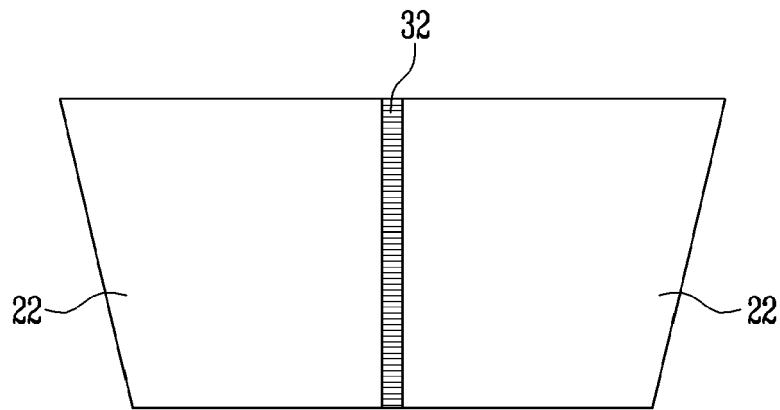


FIG. 4

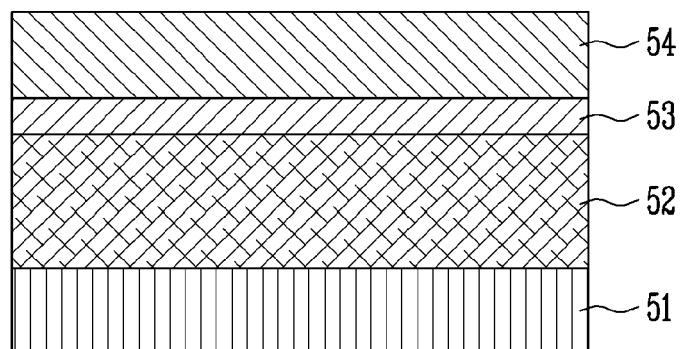
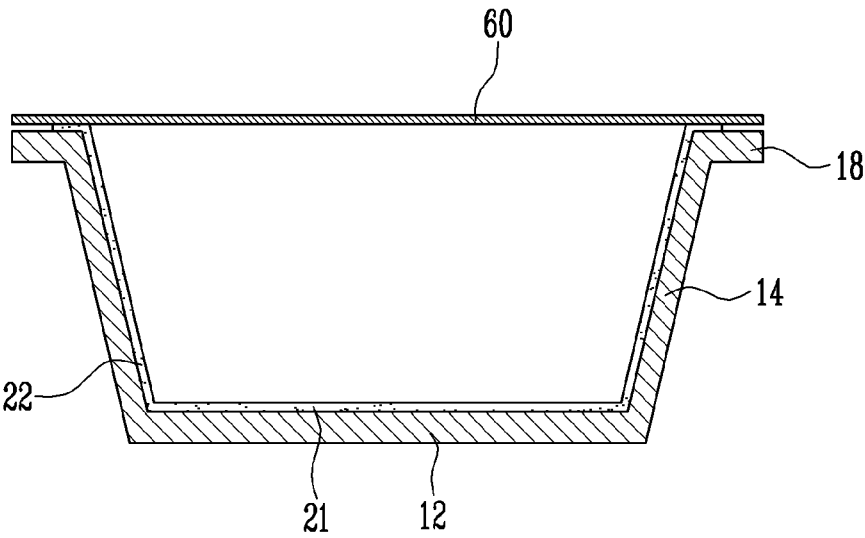


FIG. 5





EUROPEAN SEARCH REPORT

Application Number
EP 11 15 0575

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 98/49064 A1 (PLASTIPAK PACKAGING INC [US]) 5 November 1998 (1998-11-05) * page 7, line 36 - page 9, line 5; figures 1A,1B,9 *	1-11	INV. B65D25/14
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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 27 October 2011	Examiner Vesterholm, Mika
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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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 11 15 0575

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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27-10-2011

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