

(18)



Europäisches Patentamt
European Patent Office
Office européen des brevets

(11)

Publication number:

**0 132 468
B1**

(12)

EUROPEAN PATENT SPECIFICATION

(45)

Date of publication of patent specification: **24.09.86**

(51)

Int. Cl.⁴: **B 65 D 1/28, B 65 D 25/14**

(21)

Application number: **83304406.8**

(22)

Date of filing: **29.07.83**

(54)

Container body.

(43)

Date of publication of application:
13.02.85 Bulletin 85/07

(73)

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Publication of the grant of the patent:
24.09.86 Bulletin 86/39

(72)

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(84)

Designated Contracting States:
CH DE FR GB LI NL

(58)

References cited:
WO-A-82/03210
FR-A-2 347 265
FR-A-2 399 359
GB-A-2 001 893

(74)

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EP 0 132 468 B1

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Courier Press, Leamington Spa, England.

Description

The present invention relates to a container body, and more particularly to a cup-shaped container body having high gas-barrier property which is light-weight and not susceptible to significant deformations such as collapse.

A cup-shaped container body formed by drawing a relatively thin laminate blank including a metal foil and a thermoplastic film is advantageous in that it is light-weight, inexpensive and has a high gas-barrier property.

GB—A—2 001 893 discloses a method of drawing a thin laminate, consisting of a thermoplastic resin film, aluminium foil and a heat-sealable resin film, into a cup-shaped container body with a flange portion.

However, a hermetically sealed container formed by sealing the container body with a lid after filling a product tends to deform if it is opened or during transit or the like. Particularly when it collapses when opened, the product flows out of the container and pollutes fingers, tables or the like.

There are cases where it is desired to form concave patterns having a predetermined shape on the sidewall and/or the bottom wall of the aforementioned container body so as to enhance design effect or indicate the name of a manufacturing plant thereof and the like. However, in order to form the concave pattern when drawing, a die and a punch having a convex portion and a concave portion, respectively, corresponding to the concave pattern must be prepared, and a lot of labor is needed for making the punch and the die and adjusting them prior to the drawing. Further, some types of the concave pattern such as a circumferential ring pattern are not applicable to a drawn article.

In case when the aforementioned cup-shaped container body is made by thermoforming such as vacuum forming at a temperature above the softening temperature of the plastic concerned, the concave pattern is readily formed. However, since thermoforming is accompanied by large expansion of the wall of a formed article, the metal foil in the laminate is broken discontinuously, whereby the container body thus formed will have poor gas-barrier property.

A general object of the invention is to provide a cup-shaped container body having high gas barrier property which is light weight and not susceptible to significant deformations such as collapse.

A specific object of the invention is to provide a cup-shaped container body which can be formed concave patterns onto the wall portion thereof by retort sterilization under pressure or the like.

According to the invention there is provided a cup-shaped container body of the type comprising a hollow article having a flange portion, said hollow article being formed by drawing a flexible laminate blank including a thermoplastic film to form the inner surface of said hollow article and a metal foil characterised in that a reinforcing inner

hollow article having a flange portion is received in said first mentioned hollow article as outer hollow article, said inner hollow article being formed by thermoforming a blank of a thermoplastic which is heat-sealable to the thermoplastic film to form said inner surface, having a configuration corresponding to said outer hollow article, and being hermetically jointed to said outer hollow article by heat sealing at least along said flange portions thereof.

The hollow article may be formed with a concave portion having a predetermined shape on the wall portion thereof, and the outer surface of the inner article may be in substantial contact with the inner surface of the outer hollow article except the concave portion. The outer article may be formed with a concave pattern corresponding to the concave portion by exerting a fluid pressure to the container body.

These and other objects and advantages inherent in and encompassed by the invention will become more apparent from the specification and the accompanying drawings wherein like parts are designated by like numerals throughout the various figures.

Fig. 1 is a vertical sectional view showing a container body of a first embodiment according to the invention;

Fig. 2 is an enlarged sectional view of the portion A in Fig. 1;

Fig. 3 is a plan view of a hermetically sealed container formed by heat sealing a lid to the container body of Fig. 1;

Fig. 4 is a vertical sectional view taken along line IV—IV of Fig. 3;

Fig. 5 is a vertical sectional view illustrating a state where the sealed container of Fig. 3 is being opened;

Fig. 6 is a front view showing a container body of a second embodiment according to the invention;

Fig. 7 is a horizontal sectional view taken along line VII—VII of Fig. 6;

Fig. 8 is a vertical sectional view taken along line VIII—VIII of Fig. 7;

Fig. 9 is a front view of a hermetically sealed container having the container body of Fig. 6 showing a state after retort sterilization under pressure;

Fig. 10 is a horizontal sectional view taken along line X—X of Fig. 9;

Fig. 11 is a vertical sectional view taken along line XI—XI of Fig. 10;

Fig. 12 is a fragmental horizontal sectional view of the sidewall portion of a container body of a third embodiment according to the invention;

Fig. 13 is a fragmental horizontal sectional view of the sidewall portion of Fig. 12 showing a state after the container body of Fig. 12 has been placed under fluid pressure;

Fig. 14 is a front view of a container body of a fourth embodiment according to the invention after placed under fluid pressure;

Fig. 15 is a vertical sectional view of a container body of a fifth embodiment according to the invention;

Fig. 16 is an enlarged sectional view of the portion B in Fig. 15.

Referring to Figs. 1 and 2 a container body 1 consists of a cup-shaped outer hollow article 2 formed by drawing a flexible laminate blank and then curling the open edge of the drawn article, and a reinforcing cup-shaped inner hollow article 3 formed by thermoforming a thermoplastic blank and received in the outer hollow article 2. The outer hollow article 2 and the inner hollow article 3 have flange portions 4 and 5, respectively, and shapes corresponding to each other except in a curl portion 6 of the outer hollow article 2 such that the latter can be substantially fitted into the former.

Herein drawing or draw forming means a method of making a cup-shaped hollow article using a punch, a die having a cavity and a blank-holder, wherein a blank is introduced into the cavity by the punch to form the article while the portion of the blank on the upper surface of the die is pushed by the blank-holder against the upper surface, so as to prevent wrinkles from developing, and drawn into the cavity sliding between the upper surface and the blank-holder. The thickness of the sidewall portion of the drawn article is substantially same as that of the blank. Drawing is usually carried out at normal room temperature.

As best shown in Fig. 2, the flange portion 5 of the inner hollow article 3 is thermally adhered to the flange portion 4 of the outer hollow article 2 through an inner layer 2a of the flange portion 4 to form a heat sealed portion 7 such that the two are hermetically jointed to prevent the inner hollow article 3 from separating from the outer hollow article and hinder steam and air from entering between both the hollow articles during retort sterilization or the like.

It is preferable that the sidewall portion 2x of the outer hollow article 2 and the sidewall portion 3a of the inner hollow article 3 as well as the bottom wall portion 2y of the outer hollow article 2 and the bottom wall portion 3c of the inner hollow article 3 are in close contact with each other, so as to prevent dents from generating when pushed with fingers and so on, and enhance heat transfer during retort sterilization. The close contact can be facilitated by inserting the inner hollow article 3 into the outer hollow article 2 in the presence of vacuum.

As shown in Fig. 2, the outer hollow article 2 consists essentially of the inner layer 2a made of a thermoplastic film, an intermediate layer 2b made of a metal foil such as aluminum foil, steel foil, electrolytic iron foil and an outer layer 2c made of a thermoplastic foil, each layers being jointed via an adhesive layer (not shown) made of an urethane adhesive, a carboxylic acid modified polyolefin adhesive and so on.

Thermoplastic forming the inner layer 2a preferably may be heatsealable plastic having a relatively low melting point, such as polyethylene, polypropylene, a copolymer or blend thereof, nylon 11 or 12, linear polyester copolymer,

polyester-ether or the like. The thickness of the inner layer 2a preferably may be about 10 ~ 200 μm , more preferably about 30 to 100 μm . Thickness thinner than about 10 μm will fail to form the heat sealed portion 7 having a satisfactory jointing strength, while thickness layer than about 200 μm will cause large residual stress during draw forming, which will result in large spring-back after draw forming and thermal deformation during retort sterilization. It is desirable that the inner layer 2a is as thin as possible from the viewpoint of low material cost, in the range that shape-retainable property and satisfactory heat sealing strength can be assured.

The thickness of the metal foil forming the intermediate layer 2b preferably may be about 7 to 100 μm , more preferably about 7 to 60 μm . Thickness thinner than about 7 μm will cause pores in the foil, thus reducing gas barrier against oxygen, carbonic acid gas, steam and so on, while thickness larger than about 100 μm will fail to realize low material cost and low weight. When the thickness is about 7 to 60 μm , a satisfactory product can not be formed by a conventional drawing method using a blank holder, since remarkable wrinkles will develop at the flange portion 4 and the sidewall portion 2x, and rupture will occur when large blank-holding force is applied so as to eliminate the wrinkle.

However, in case where drawing is carried out while elastic force is being exerted to the blank along the radiused corner portion of a die according to the method described in British Laid-open Patent Publication GB 2001893A proposed by the present inventors, a satisfactory product can be obtained without generating wrinkles.

Thermoplastic forming the outer layer 2c may be nylon 6, nylon 6, 6, nylon 6, 10, drawn or non-drawn polyethylene terephthalate, polyethylene, polypropylene, and copolymer or a blend thereof and so on. It is desirable from the viewpoint of low material cost that the thickness of the outer layer 2c is as thin as possible in the range that laminating operation is possible, and shape-retainable property and anti-corrosion of the metal foil can be assured, and usually may be less than about 50 μm . Printed container bodies may be obtained by photogravure the back surface of the film forming the outer layer 2c

In case where the intermediate layer 2b is relatively thick, the metal foil may be directly applied an anti-corrosion lacquer coating as the outer layer 2c without applying the thermoplastic film.

The inner hollow article 3 is formed by thermoforming from a blank of thermoplastic which is heatsealable with the inner layer 2a, that is, preferably same or of same type as the thermoplastic forming the inner layer 2a, wherein e.g. low density polyethylene is of same type as medium density polyethylene.

Herein thermoforming means a method of molding a cup-shaped hollow article at a softened or melt state of the plastic concerned, such as vacuum forming, pressure air forming and injec-

tion forming wherein residual stress in the formed article is substantially zero or slight, and thus thermal shrinkage due to retort sterilization is substantially zero or slight.

The thickness of the inner hollow article 3 preferably may be about 0.3 to 2.0 mm, more preferably about 0.5 to 1.0 mm. The wall portions thinner than about 0.3 mm will be flexible and fail to reinforce the flexible outer hollow article 2, while thickness larger than about 2.0 mm will make the heat sealing of the flange portion 5 difficult, and incur high material cost and increased weight. The heat sealing of the flange portion may be carried out by any suitable method such as a high-frequency induction heating method, an ultrasonic method and an impulse method or the like.

Figs. 3 and 4 illustrate a hermetically sealed container 15 formed by filling a product 14 in the container body 1 and then heat sealing a lid 8 thereto. The lid 8 includes a metal sheet such as an aluminum alloy sheet or tinplate and a thermoplastic film (not shown) which is heat-sealable with the thermoplastic forming the inner hollow article 3 and laminated to the inner surface of the metal sheet. The peripheral portion 8a is heat sealed to the flange portion 5 of the inner hollow article 3 to form a heat seal portion 19. The lid 8 is an easy opening end of so-called full-open type formed with a circular score 17 defining the opening portion and having a ring pull-tab 16 adhered to the lid 8 at the fixing portion 16a.

Fig. 5 denotes a state where the container 15 is opened by pulling up the pull-tab 16 with a finger 18 and rupturing the score 17. In this case the container body 1 is gripped relatively strongly by a hand against the force needed to rupture the score 17, but the container body 1 will not collapse by virtue of the reinforcing function of the inner hollow article 3, and thus the contents 14 will not flow out from the container body 1, preventing the hand and so on from polluting.

Referring to Figs. 6, 7 and 8, a container body 11 is different from the container body 1 in that the sidewall portion 13a of an inner hollow article 13 is formed with a plurality of (eight in the drawing) elongated concave portions 13b extending straightly and substantially axially during thermoforming. The outer hollow article 2 is not formed with such a concave portion, and thus the outer surface of the sidewall portion 13a of the inner hollow article and the inner surface of the sidewall portion 2x of the outer hollow article 2 as well as the outer surface of the bottom wall portion 13c of the inner hollow article 13 and the inner surface of the bottom wall portion 2y of the outer hollow article 2 are substantially in contact with each other except along the concave portions 13b.

Figs. 9, 10 and 11 denote a hermetically sealed container 15' formed by filling a product 14, heat sealing a lid 8 and then subjected to retort sterilization under pressure (e.g.

120°C × 30 minutes at 2 kg/cm²). The portions of the sidewall portion of the flexible outer hollow article 2 corresponding to the concave portions 13b, as shown in Figs. 10 and 11, are depressed into the concave portion 13b radially inwardly under pressure during retort sterilization to form concave patterns 12 having a configuration corresponding to the concave portion 13b.

The inner hollow article 3 formed by thermoforming is usually subjected to no or slight thermal shrinkage, e.g. less than of about 1.0 to 1.5 % in diameter, by heating during retort treatment, while the outer hollow article 2 including the metal foil will not thermally shrink since it is restrained by the metal foil. Accordingly, and due to the hermetically heat sealed portion 7, in case where the concave portions 13b are not formed such as in case of the container 15, a slight vacant space will develop between the outer and inner hollow articles. Since the vacant space is under negative pressure, it tends to cause irregular uneven patterns in the sidewall portion of the flexible outer hollow article 2 and reduce commercial value of the container.

In case where the concave portions 13b are formed such as in case of the container 15', however, when the concave patterns 12 are formed, the portions 2x, except the concave portions 12 of the sidewall portion 2x of the outer hollow article 2 are pulled circumferentially and brought into closer contact with the inner hollow article 3, as best shown in Fig. 10, and thus the aforementioned irregular, uneven patterns will not develop.

The regular concave patterns 12 will enhance aesthetic appearance of the container 15'. Furthermore, it is possible to judge whether any container having the container body 11 was subjected to retort sterilization or not, based on the presence or the absence of the concave patterns 12.

In case of hermetically sealed containers which are generally not subjected to retort sterilization under pressure such as hot-packed containers which are usually filled liquid products such as juices of about 85 to 95°C, or sealed containers containing dry foods, the container body 11 preparatory to filling a product may be placed in a pressure chamber having a fluid pressure such as air pressure or liquid pressure higher than 1 kg/cm², preferably 2 kg/cm² to form the concave patterns 12, preferably after heated or while heating to or at a temperature higher than 60°C and lower than the melting point of the plastic concerned, e.g. a temperature of 120°C.

The shapes of the concave portions for forming the concave pattern can be determined suitably according to the design desired. Referring to Fig. 12, a container body 21 has an inner hollow article 23 received in the outer hollow article 2, the inner article 23 being formed with a multitude of elongated concave portions 23b extending linearly and substantially axially to form a corrugated sidewall portion. In this case

also, as shown in Fig. 13, there can be formed corrugated patterns 22 having a shape corresponding to the concave portions 23b, by a pressure treatment such as retort sterilization under pressure.

Fig. 14 illustrates a container body 31 having the outer hollow article 2 whose sidewall portion is formed with a circumferential, circular concave pattern 32a, a circumferential, wavy pattern 32b, an A-shaped dent pattern 32c and a C-shaped dent pattern 32d. These concave patterns usually can not be formed by only drawing a flexible laminate blank.

While certain embodiments of the invention have been described for purposes of illustration, it is to be understood that there may be various embodiments and modifications within the general scope of the invention. For example, concave portions for forming concave patterns may be formed onto the outer surface of the bottom wall portion of the inner hollow article. The outer and inner hollow articles may be of any configuration such as a cup-shape of round-cornered square in a horizontal section, in the scope of the spirit of the invention. The lid may be of the type which is not provided with the score and the pull-tab and is adapted to be opened by peeling off the heat sealed portion.

A practical example will be described hereinafter:

Practical Example

An outer hollow article 2 having a configuration shown in Figs. 6 to 8 was formed by cold drawing a laminate blank by means of a punch having an elastic rubber sleeve of the type described in British Laid-open Patent Publication GB 2001893A and then curling the open edge of the drawn article, the laminate including an inner layer 2a made of a polypropylene film of 70 μm thick, an intermediate layer 2b made of a soft aluminum foil of 50 μm thick and an outer layer 2c made of a non-drawn nylon 6 film of 40 μm thick whose back surface is photogravured, each layers being jointed to each other with an urethane adhesive.

The height up to the upper surface of the flange portion 4 of the hollow article 2, the width of the flange portion, the diameter of the inner edge of the flange portion 4 were 30 mm, 3 mm and 65 mm, respectively, and the capacity thereof was 75 c.c.

An inner hollow article 3 having concave portions 13b of the type shown in Figs. 6 to 8 and having a configuration wherein the inner hollow article 3 is insertable into the outer hollow article 2 so as to be in close contact with the outer article 2 except along the concave portions 13b, was formed from a polypropylene blank of 0.8 mm thick by vacuum forming at 190°C the thickness of the sidewall portion 13a being about 0.5 mm. Thereafter, the inner article 13 was inserted into the outer article 2 under vacuum, and the flange portions 4 and 5 were heat adhered to each other by high-frequency induction heating.

A lid 8 having a ring pull-tab 16 was formed

from a laminate blank, the laminate having an inner layer made of polypropylene of 50 μm thick, an intermediate adhesive layer of maleic anhydride modified polypropylene of 10 μm thick, and an outer layer of aluminum foil of 100 μm thick whose outer surface is applied with epoxy-phenolic lacquer coating.

The container body 1 thus made was filled with 70 grams of potato salad containing 1 weight % of salt, and then heat sealed with the lid 8 along the flange portion 5 by means of a heating bar for 1 second at 230°C to form the hermetically sealed container 15'.

The container 15' was subjected to retort sterilization for 30 minutes at 120°C under air pressure of 2 kg/cm², and concave patterns 12 such as shown in Figs. 9 and 10 were formed without developing irregular, uneven deformations in the sidewall portion. The container 15' as sterilized was opened by pulling up the ring pull-tab 16 as shown in Fig. 5 without causing significant deformations such as collapse in the container body 11.

Figs. 15 and 16 illustrate a container body 41 comprising a cup-shaped reinforcing plastic hollow article 43 which corresponds to the inner hollow article 3 and a cup-shaped flexible laminate hollow article 42 which corresponds to the outer hollow article 2 and is received in the plastic article 43.

Thermoplastic film forming the outer layer 42c of the laminate article 42 is substantially same in its kind and thickness as the thermoplastic film forming the inner layer 2a in Fig. 2 such that the laminate article 42 and the plastic article 43 can be heat sealed along the flange 44 and 45 to form a heat sealed portion 47. Except the outer layer 42c, the material structures of the laminate article 42 and the plastic article 43 are substantially same as those of the outer article 2 and the inner article 3, respectively. For example, the inner layer 42a and the intermediate layer 42b are made of substantially same material as the inner layer 2a and the intermediate layer 2b of the outer article 2, respectively. A lid (not shown) is heat sealed to the portion of the inner layer 42 corresponding to the flange portion 44.

The container body 41 has an appearance of a plastic container and high-barrier property, and is not susceptible to significant deformations such as collapse.

Claims

1. A cup-shaped container body (1) comprising a hollow article (2) having a flange portion (4), said hollow article being formed by drawing a flexible laminate blank including a thermoplastic film (2a) to form the inner surface of said hollow article and a metal foil (2b) characterised in that a reinforcing inner hollow article (3) having a flange portion (5) is received in said first mentioned hollow article as outer hollow article, said inner hollow article being formed by thermoforming a blank of a thermoplastic which is heatsealable to

the thermoplastic film to form said inner surface, having a configuration corresponding to said outer hollow article, and being hermetically jointed to said outer hollow article by heat sealing at least along said flange portions (4, 5) thereof.

2. A cup-shaped container body (1) as claimed in Claim 1, wherein said inner hollow article (13) is formed with a concave portion (13b) having a predetermined shape on the outside of a wall portion (13a) thereof, and the outer surface of said inner hollow article (3) is in substantial contact with the inner surface of said outer hollow article (2) except in said concave portion.

3. A cup-shaped container body as claimed in Claim 2, wherein said outer hollow article is formed with a concave pattern (12) corresponding to said concave portion (13b) of the inner hollow article by exerting a fluid pressure to said container body.

4. A cup-shaped container body as claimed in Claim 3, wherein said fluid pressure is exerted during retort sterilization.

5. A cup-shaped container body as claimed in Claim 1, wherein said metal foil (2b) is an aluminum foil of 7 to 100 μ m thick.

6. A cup-shaped container body as claimed in Claim 1, wherein said thermoplastic film forming said inner surface is a heatsealable plastic film of 10 to 200 μ m thick.

7. A cup-shaped container body as claimed in Claim 1, wherein said inner hollow article is formed of a thermoplastic of 0.3 to 2.0 mm thick.

8. A cup-shaped container body (41) comprising a hollow article (42) having a flange portion (44), said hollow article being formed by drawing a flexible laminate blank including thermoplastic films to form the inner surface and the outer surface of said hollow article and a metal foil (42b), characterised in that a reinforcing outer hollow article (43) having a flange portion (45) receives said first mentioned hollow article as inner hollow article (42) therein, said outer hollow article being formed by thermoforming a blank of a thermoplastic which is heatsealable to the thermoplastic film to form the outer surface, having a configuration corresponding to said inner hollow article, and being hermetically jointed to said inner hollow article by heat sealing at least along said flange portions thereof.

Patentansprüche

1. Napfförmiger Behälterkörper (1) mit einem Hohlkörper (2), der einen Flanschteil (4) hat und durch Ziehen eines flexiblen Laminatrohrlings mit einer thermoplastischen Schicht (2a) zur Bildung der Innenfläche des Hohlkörpers und einer Metallfolie (2b) gebildet ist, dadurch gekennzeichnet, daß ein verstärkender innerer Hohlkörper (3) mit einem Flanschteil (5) im ersterwähnten Hohlkörper als äußerem Hohlkörper aufgenommen ist, welcher innere Hohlkörper durch Warmformen eines Rohlings aus einem Thermoplast, das mit der thermoplastischen Schicht zur Bildung der Innenfläche heißversiegelbar ist, gebildet ist, eine

der des äußeren Hohlkörpers entsprechende Kontur hat und mit dem äußeren Hohlkörper durch Heißversiegeln wenigstens längs deren Flanschteile (4, 5) hermetisch dicht verbunden ist.

2. Napfförmiger Behälterkörper (1) nach Anspruch 1, wobei der innere Hohlkörper (13) mit einem konkaven Teil (13b) vorbestimmter Form an der Außenseite eines Wandteils (13a) desselben ausgebildet ist und die Außenfläche des inneren Hohlkörpers (13) im wesentlichen kontakt mit der Innenfläche des äußeren Hohlkörpers (2) mit Ausnahme im konkaven Teil ist.

3. Napfförmiger Behälterkörper nach Anspruch 2, wobei der äußere Hohlkörper mit einem konkaven Muster (12) entsprechend dem konkaven Teil (13b) des inneren Hohlkörpers durch Ausüben eines Fluiddrucks auf den Behälterkörper ausgebildet ist.

4. Napfförmiger Behälterkörper nach Anspruch 3, wobei der Fluiddruck während Retortenentkeimung ausgeübt wird.

5. Napfförmiger Behälterkörper nach Anspruch 1, wobei die Metallfolie (2b) eine 7 bis 100 μ m dicke Aluminiumfolie ist.

6. Napfförmiger Behälterkörper nach Anspruch 1, wobei die die Innenfläche bildende thermoplastische Schicht eine 10 bis 200 μ m dicke, heißversiegelbare plastische Schicht ist.

7. Napfförmiger Behälterkörper nach Anspruch 1, wobei der innere Hohlkörper aus einem 0,3 bis 2,0 mm dicken Thermoplast gebildet ist.

8. Napfförmiger Behälterkörper (41) mit einem Hohlkörper (42), der einen Flanschteil (44) hat und durch Ziehen eines flexiblen Laminatrohrlings mit thermoplastischen Schichten zur Bildung der Innenfläche und der Außenfläche des Hohlkörpers und einer Metallfolie (42b) gebildet ist, dadurch gekennzeichnet, daß ein verstärkender äußerer Hohlkörper (43) mit einem Flanschteil (45) den ersterwähnten Hohlkörper als inneren Hohlkörper (42) darin aufnimmt, welcher äußere Hohlkörper durch Warmformen eines Rohlings aus einem Thermoplast, das mit der thermoplastischen Schicht zur Bildung der Außenfläche heißversiegelbar ist, gebildet ist, eine der inneren Hohlkörpers entsprechende Kontur hat und mit dem inneren Hohlkörper durch Heißversiegeln wenigstens längs deren Flanschteile hermetisch dicht verbunden ist.

Revendications

1. Corps de récipient (1) en forme de tasse comprenant un article creux (2) pourvu d'une partie formant collerette (4), ledit article creux étant formé par emboutissage d'un flan en matière stratifiée flexible comportant un film de matière thermoplastique (2a) servant à former la surface intérieure dudit article creux, et une feuille métallique (2b), caractérisé par le fait qu'un article creux intérieur de renforcement (3) comportant une partie formant collerette (5) est reçue dans ledit article creux mentionné en premier sous la forme d'un article creux extérieur, ledit article creux intérieur étant réalisé par thermoformage

d'un flan d'une matière thermoplastique qui est scellable à chaud sur le film de matière thermoplastique pour former ladite surface intérieure, ayant une configuration correspondant audit article creux extérieur, et étant hermétiquement joint audit article creux extérieur par scellement à chaud au moins le long desdites parties formant collerette (4, 5).

2. Corps de récipient en forme de tasse, tel que revendiqué dans la revendication 1, dans lequel ledit article creux intérieur (13) est pourvu d'une partie concave (13b) ayant une forme prédéterminée sur le côté extérieur d'une partie de paroi (13a) de celui-ci, et la surface extérieure dudit article creux intérieur (3) est en contact substantiel avec la surface intérieure dudit article creux extérieur (2), excepté dans ladite partie concave.

3. Corps de récipient en forme de tasse, tel que revendiqué dans la revendication 2, dans lequel ledit article creux extérieur est pourvu d'un motif concave (12) correspondant à ladite partie concave (13b) dudit article creux intérieur par application d'une pression de fluide audit corps de récipient.

4. Corps de récipient en forme de tasse, tel que revendiqué dans la revendication 3, dans lequel ladite pression de fluide est exercée durant une opération de stérilisation en vase clos.

5. Corps de récipient en forme de tasse tel que revendiqué dans la revendication 1, dans lequel ladite feuille métallique (2b) est une feuille d'aluminium de 7 à 100 µm.

6. Corps de récipient en forme de tasse, tel que revendiqué dans la revendication 1, dans lequel ledit film de matière thermoplastique formant ladite surface extérieure est un film de matière plastique scellable à chaud de 10 à 200 µm d'épaisseur.

7. Corps de récipient en forme de tasse, tel que revendiqué dans la revendication 1, dans lequel ledit article creux est formé d'une matière thermoplastique de 0,3 à 2,0 mm d'épaisseur.

8. Corps de récipient (41) en forme de tasse comprenant un article creux (42) pourvu d'une partie formant collerette (44), ledit article creux étant par emboutissage d'un flan de matière stratifiée flexible comportant des films de matière thermoplastique pour former la surface intérieure et la surface extérieure dudit article creux et une feuille métallique (42b), caractérisé par le fait qu'un article creux extérieur de renforcement (43) comportant une partie formant une collerette (45) reçoit ledit article creux mentionné en premier comme article creux intérieur (42), ledit article creux extérieur étant réalisé par thermoformage d'un flan de matière thermoplastique, qui est scellable à chaud sur le film thermoplastique pour former la surface extérieure, ayant une configuration correspondant audit article creux intérieur, et étant hermétiquement joint avec ledit article creux intérieur par scellement à chaud au moins le long desdites parties formant collerette.

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FIG. 1

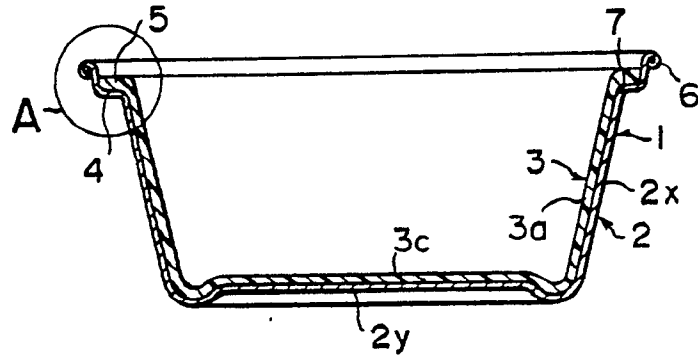


FIG. 2

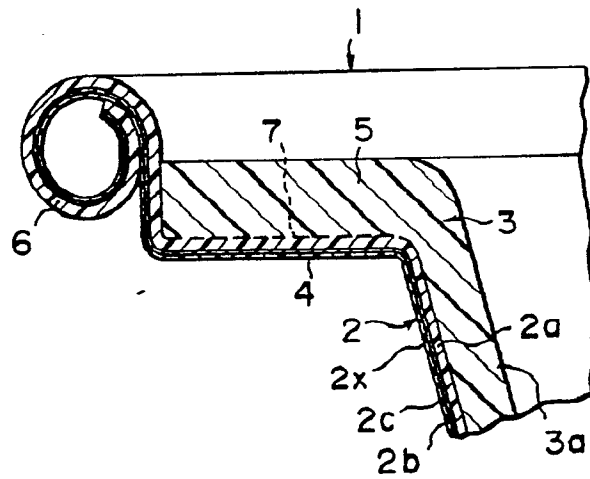


FIG. 3

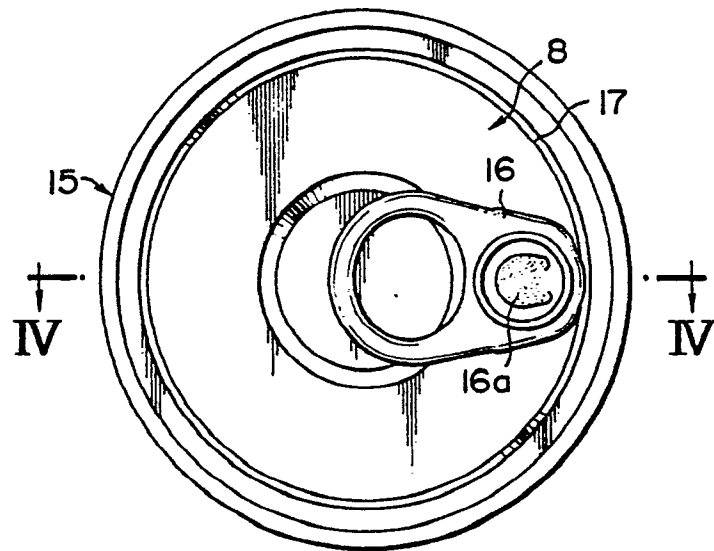


FIG. 4

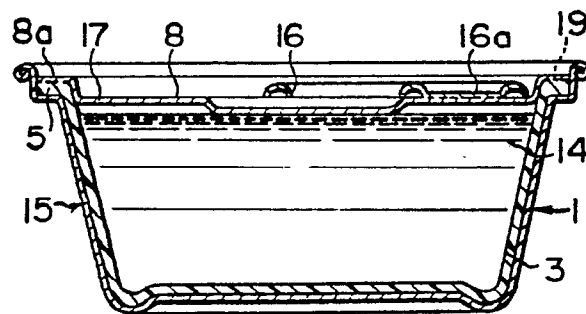


FIG. 5

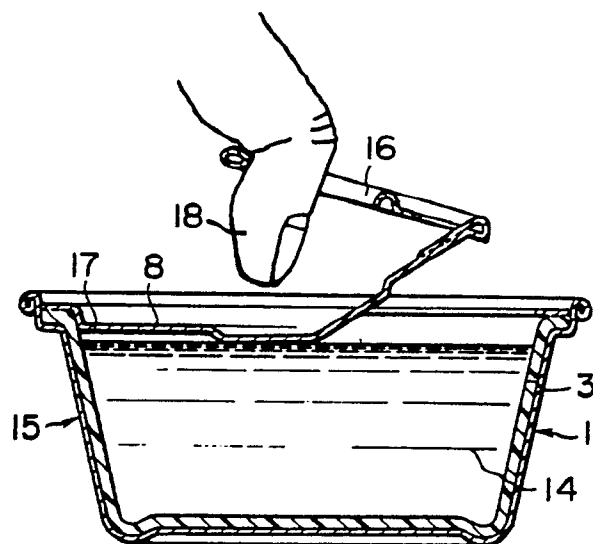


FIG. 6

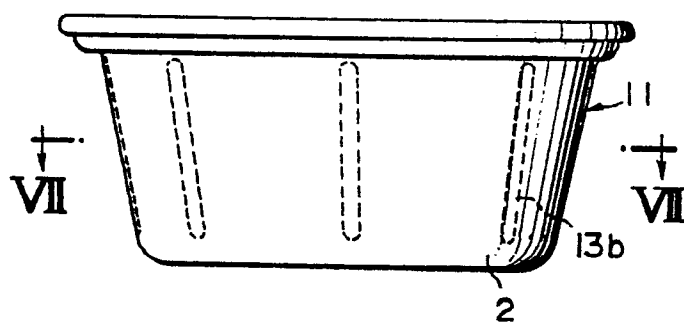


FIG. 7

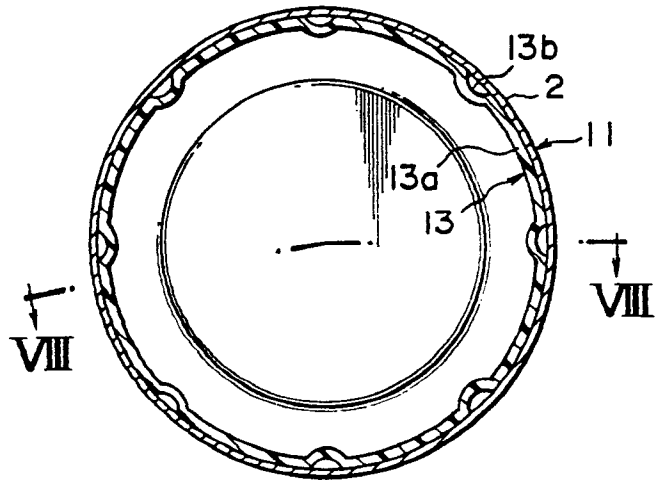


FIG. 8

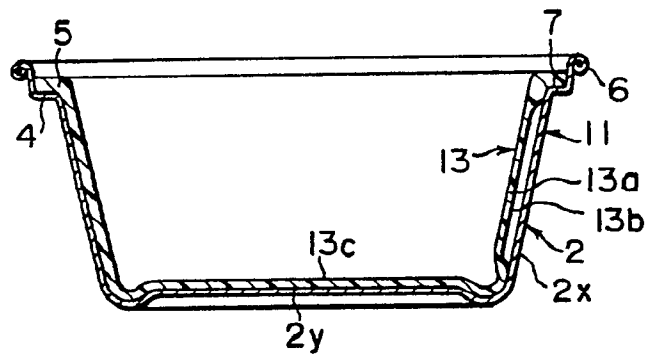


FIG. 9

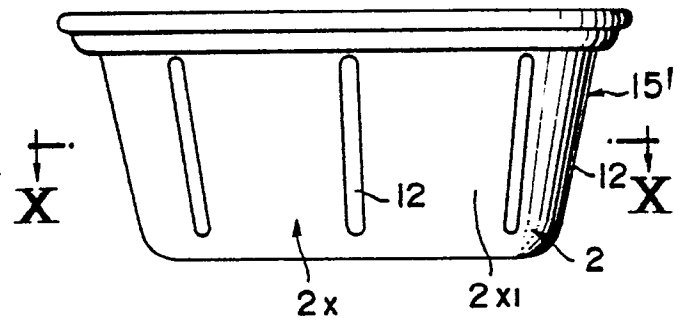


FIG. 10

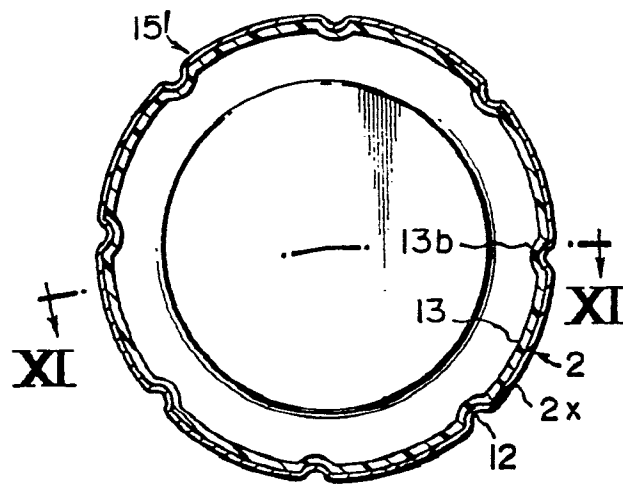


FIG. 11

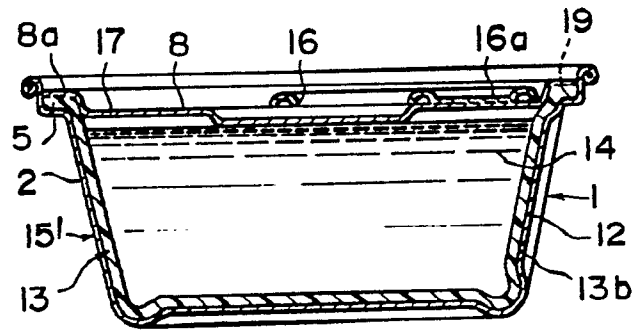


FIG. 12

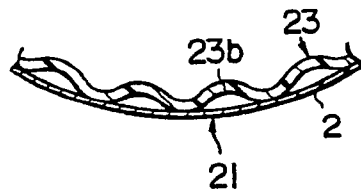


FIG. 13

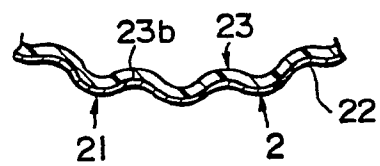


FIG. 14

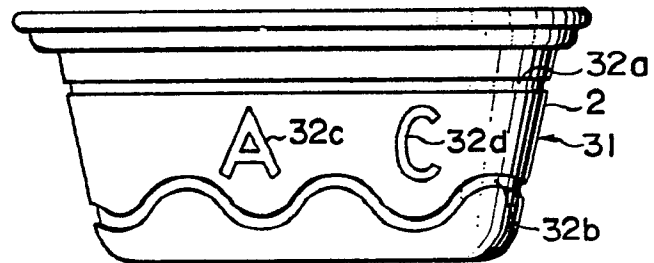


FIG. 15

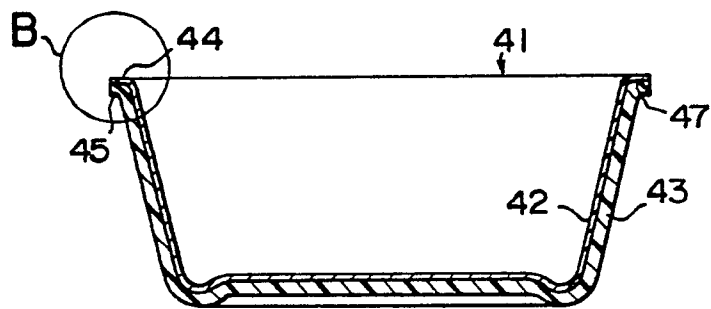


FIG. 16

