



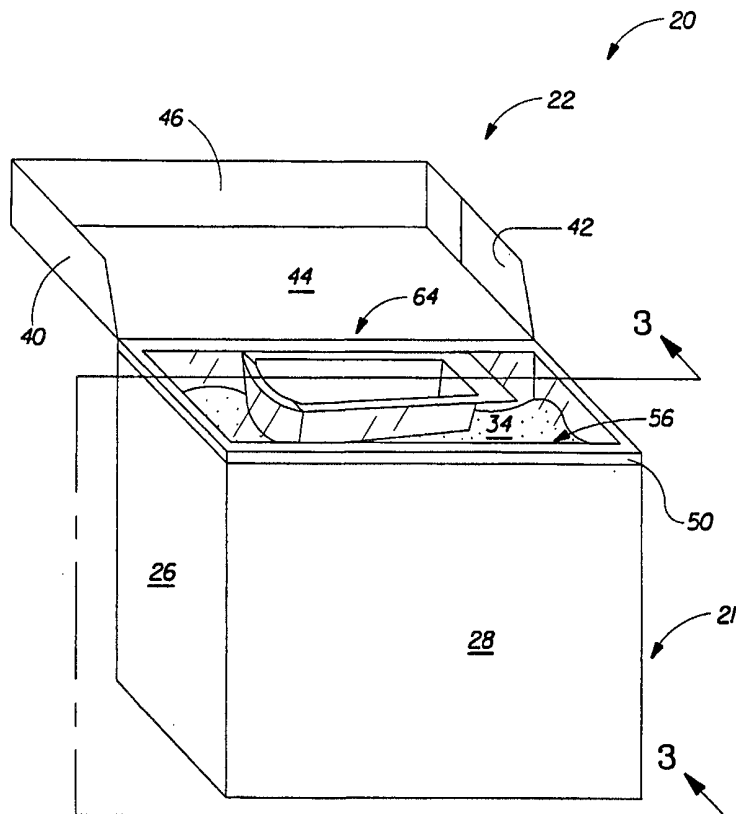
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(54) Title: CARTONS HAVING A SEAL FOR SEPARATING A UTENSIL FROM THE CARTON'S CONTENTS

(57) Abstract

A package for a product is provided. The package has a container (21) for storing the product. The container has an opening (56) through which the product (34) can be removed during use. A lid (22) is attached to the container by a hinge (48), and the lid closes the opening when the lid is in a closed position. A seal (50) extends across the opening to separate the product stored in the container from the environment, thereby maintaining the freshness and integrity of the product stored in the package. The seal has a depression (72) therein for receiving a utensil (64) such that the utensil is separated from the product of the container. This arrangement provides a clean utensil which is easily located by a user of the package upon first opening of the package. The seal can be formed as single layer or from a plurality of layers.



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CARTONS HAVING A SEAL FOR SEPARATING A UTENSIL FROM THE CARTON'S CONTENTS

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FIELD OF THE INVENTION

This invention relates to the field of cartons, and more particularly, to an open top carton having a seal for separating a utensil, such as a measuring device, from the container's contents.

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BACKGROUND OF THE INVENTION

Reclosable cartons for storing products, such as granular materials like laundry detergents and foods, have been available for many years. These cartons are typically formed from cardboard and may include a seal for separating a utensil from the product stored in the package. For instance, PCT/EP98/00466 discloses a container with a cardboard frame having a window which is sealed with a peel off sheet. The frame is welded to the inside of the container and a utensil is stored in the sheet.

While some prior cartons have seals for separating a utensil from the product in the carton, there exists a need to provide a carton having simplified seal arrangements which are easier to manufacture and which provide improved access to the product stored in the carton after removal. Still further, there exists a need to provide a carton having a seal which provides greater flexibility for accommodating various shaped and sized utensils. Yet further, there exists a need for a carton which can accommodate improved methods for attaching the seal to the package and which requires fewer joints between the seal and the carton.

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SUMMARY OF THE INVENTION

A package for a product is provided. The package has a container for storing the product. The container has an opening through which the product can be removed during use. A lid is attached to the container by a hinge, and the lid closes the opening when the lid is in a closed position. A seal extends across the opening to separate the product stored in the container from the environment, thereby maintaining the freshness and integrity of the product stored in the package. The seal has a depression therein for receiving a utensil such that the utensil is separated from the product of the container. This arrangement provides a clean utensil (e.g., one that has not been exposed to the product of the package) which is easily located by a user of the package upon first opening of the package.

The container can include four interconnected side panels and a base which is interconnected with each of the side panels, wherein the opening is disposed opposite the base. The seal can be attached to the container about a portion of the outer surface of each of the side panels or about the top perimeter or inner surface of the side panels. The seal can be formed as a
5 single layer or from a plurality of layers.

BRIEF DESCRIPTION OF THE DRAWING

While the specification concludes with claims particularly pointing out and distinctly claiming the invention, it is believed that the present invention will be better understood from the
10 following description taken in conjunction with the accompanying drawings in which:

Fig. 1 is a perspective view of a preferred package made in accordance with the present invention, wherein the lid is in the closed position;

Fig. 2 is a perspective view of the package of Fig. 1, wherein the lid is in the raised position thereby exposing an inner seal;

15 Fig. 3a is an enlarged partial cross-sectional side view of the package of Fig. 2, taken along line 3-3 thereof, wherein the seal comprises a single layer;

Fig. 3b is an enlarged partial cross-sectional side view of the package of Fig. 2, taken along line 3-3 thereof, wherein the seal comprises a single layer which is connected to the inside of the package;

20 Figs. 4a and 4b are enlarged partial cross-sectional side views of preferred tri-layer seals suitable for use with the package of Fig. 2;

Fig. 4c is an enlarged partial cross-sectional side view of a preferred tri-layer seal suitable for use with the package of Fig. 2, wherein the sealing and barrier layers are disposed adjacent to each other;

25 Fig. 4d is an enlarged partial cross-sectional side view of a preferred five layer seal suitable for use with the package of Fig. 2; and

Figs. 5a and 5b are enlarged partial cross-sectional side views of preferred bi-layer seals suitable for use with the package of Fig. 2.

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DETAILED DESCRIPTION OF THE INVENTION

Reference will now be made in detail to the present preferred embodiments of the invention, examples of which are illustrated in the accompanying drawings, wherein like

numerals indicate the same elements throughout the views and wherein reference numerals having the same last two digits (e.g., 20 and 120) connote similar elements. As discussed more fully hereafter, the present invention is directed to a package which advantageously provides a clean utensil (e.g., one that has not been exposed to the product of the package) which is easily located by a user of the package upon first opening of the package. In addition, the present invention provides a simplified arrangement for a package which can maintain the freshness and integrity of a product contained in the package (e.g., by preventing the passage of undesirable compounds, such as moisture, from the environment to the product or the escape of desirable compounds, such as perfumes, from the product to the environment). Still further, the present invention can prevent undesirable leakage or escape of the product from the package prior to opening. As will be more fully appreciated hereafter, preferred embodiments of the present invention comprise an inner seal which both separates a utensil from the product and prevents undesirable escape of the product from the package prior to the first opening of the package.

An exemplary carton or package 20 made in accordance with the present invention is illustrated in Fig 1. The package 20 is illustrated as a six-sided parallelepiped carton having a lid 22 interconnected with a container 21. The container 21 is formed from a base 24 and side panels 26, 28, 30 and 32. The lid, base and side panels each have inner and outer surfaces, wherein the inner surfaces are disposed within the interior of the package 20 and the outer surfaces are disposed about the exterior of the package (the outer surfaces only being visible in Fig. 1). The container 21 and lid 22 can be formed from a variety of materials, including, but not limited to, plastics, cardboard or a cardboard which is laminated or coated with a moisture barrier material, such as polyethylene, polypropylene, varnish or other moisture resistant materials known in the art.

The package 20 is preferably used to store a powdered or granular product 34 (Figs. 2 and 3), examples of which might include laundry detergents, foods, cleaning products and the like. In addition, the package 20 can be used to store any other products where it is desired to provide a freshness seal, prevent exposure of the product to undesirable compounds (e.g., air or moisture) and/or to separate a utensil from the product stored in the package. The terms "granular" and "powdered" are used interchangeably herein and are intended to refer to any products comprising solid or semi-solid particles. While the present invention is described herein with reference to the exemplary six-sided package of Fig 1, it is contemplated that the present invention can be adapted for use with other package configurations and shapes. For example, the present invention can be used with packages having one or more curved or curvilinear panels and the like. Further, the present invention can be used with top fill and side fill cartons.

The lid 22 includes side lid flaps 40 and 42, a top lid flap 44 and a front lid flap 46. The lid 22 is connected to the side panel 32 by a hinge 48, which is disposed between the top lid flap 44 and the side panel 32, so that the lid 22 can be raised and lowered, thereby exposing or sealing the interior of the container 21 from the environment. As will be appreciated, the hinge 48 can be integrally formed with the lid 22 and side panel 32 or can be provided as a separate structure, as is known in the art. The side and front lid flaps 40, 42 and 46 overlap with the side panels 26, 28 and 30, respectively, when the lid 22 is in the closed or lowered position. While the package 20 is illustrated in Fig. 1 with the lid 22 disposed at the top of the carton, it is contemplated that the lid 22 can be placed at other locations, multiple lids can be provided and other lid configurations can be accommodated. The lid and various panels of the container 21 can be formed as is known in the art. In addition, the container 21 and lid 22 can comprise various closure structures for recloseably securing the lid and container, some such structures being described in the commonly assigned US patent application entitled "SIFT-RESISTANT CARTONS HAVING SLOTTED CLOSURE STRUCTURES" by Paul Höfte and filed concurrently herewith on March 4, 1999 under express mailing label no. EL251623226US, this application being incorporated herein by reference.

As best seen in Figs. 2 and 3 and in accordance with one aspect of the present invention, the container 21 comprises a seal 50 having inner and outer surfaces 52 and 54, respectively, wherein the inner surface 52 is disposed adjacent to and seals an opening 56 of the container 21. As discussed more fully hereafter, the seal 50 can be provided in various forms, including but not limited to, single layer or multilayer configurations which preferably accommodate mechanical deformation to provide a location for storing a utensil apart from the product 34 of the container 21. The seal 50 extends across the opening 56 to the side panels to seal the product 34 from the environment. This can beneficially maintain the freshness of the product 34 by preventing the passage of compounds into and out of the container 21 and also provides a sift-resistant package which prevents escape of the product 34 during shipment and distribution. After removal of the seal 50, the product 34 can be removed from the container 21 through the opening 56. A portion of the inner surface 52 of the seal 50 is also disposed adjacent to and is attached to a portion of the outer surface 58 of the side panels 26, 28 and 30. While the seal 50 is illustrated as attached to a portion of the outer surface 58 of the side panels 26, 28 and 30, it is contemplated that the seals of the present invention can be attached to a portion of the inner surface 60 of any of the side panels (i.e., inside of the container 21 as shown in Fig. 3b) or along the top perimeter 62 of the side panels, or in any combination thereof. Further, the seal 50 can be attached to the top lid flap 44 to provide a more complete seal about the opening 78 of the container 21. The seal 50

can be provided with tabbed structures to facilitate its complete removal from the container 21 by peeling, or, the seal 50 can remain attached at one of the side panels or the top lid flap 44 so that it can be reused after the first opening of the container 21 to reseal the container and to continue to provide a utensil which is separated from the product during use.

5 In accordance with another aspect of the present invention, the seal 50 also accommodates the storage of a utensil within the container 21. More preferably, the utensil is provided in the form of a scoop, an exemplary scoop 64 being illustrated in Figs 3a and 3b and having a bowl 66 for scooping the product 34 from the container 21 and a handle 70. As will be appreciated, this package configuration provides a user of the package 20 with a mess free scoop
10 (i.e., the scoop is not contaminated with the product nor is it necessary to search through the product to locate the scoop) upon first opening the package 20. While the remainder of the description is made with respect to the scoop 64 for ease and simplicity, it will be understood that the present invention can accommodate other scoops of varied sizes and shapes. For instance, the scoop might include a lip or have a curvilinear or other non-planar handle. Further, other
15 utensils, such as spoons, forks, other types of measuring devices and scooping devices, etc., can be accommodated.

The seal 50 is preferably substantially planar across the opening 56 except for a depression 72 which is formed in the seal 50 for receiving at least a portion of the scoop 64. The depression can be placed anywhere along the seal 50, although it is preferably centered within the
20 opening 56 of the container 21. The inner surface 74 of the depression 72 generally conforms to the shape of the outer surface 76 of the bowl 66 of the scoop 64 such that the opening 78 of the seal 50 is of sufficient size and shape to receive the bowl 66 of the scoop 64 therethrough. The seal 50 supports the scoop 64 at the base of the bowl 66. Alternatively, the depression 72 can be sized to receive the entire scoop 64. For example, the size and shape of the depression 72 might
25 closely parallel the overall size and overall shape of the scoop 64 or the depression 72 might be provided in a more conventional geometric shape (e.g., a polyhedron such as a cubic depression) having sufficient volume to accommodate the entire scoop 64 therewithin.

The seal 50 also comprises one or more downwardly depending extensions 80 which are disposed adjacent the outer surface 58 of the side panels 26, 28 and 30. The length of the
30 extensions 80 should be sufficient to provide a satisfactory surface for attaching the seal 50 to the side panels. More preferably, the length L of the extensions is between about 0 mm and about 50 mm for a package having about 1 kg. of product stored therein.

The seal 50 is preferably formed from a flexible thermoplastic polymer such that the depression 72 can be created using a thermoforming process. More particularly, a film of

thermoplastic material is heated (e.g., between about 50C and about 300C) and pressed against the contours of a mold in the shape of the scoop 64. The film is allowed to cool until it retains the shape of the mold and is then removed and trimmed to the size of the seal 50. Vacuum, air or mechanical means can be used to press the heated film against the mold during the forming process. The formed seal 50 is then attached to portions of the outer surfaces 58 of the side panels 26, 28 and 30 using an adhesive, such as a cold glue (e.g., an appropriate water based adhesive), a hot melt or a heat sealing layer. The integrity of the attachment of the seal to the container 21 can be measured by the peeling strength (kgf) of the seal after attachment. Preferably, the peeling strength is at least about 0.2 kgf and, more preferably, at least about 0.4 kgf.

The seal 50 can be formed as a single layer, such as shown in Figs. 3a and 3b, from one or more materials. For instance, the seal 50 might comprise a single layer of a single material (e.g., formed from linear low density polyethylene (LLDPE)) as shown in Fig. 3a. Or a seal 150 (Fig. 3b) might be provided which comprises more than one material (e.g., a sealing material 79 and a thermoformable material 81), wherein the materials are disposed substantially planar with and adjacent to each other as shown. In the single layer seal 50, the material forming the seal 50 preferably has a softening temperature which can accommodate thermoforming of the depression as well as attachment to the container 21 by softening or melting when exposed to a conventional heating instrument, such as an iron. As used herein, the phrase "softening temperature" is intended to refer to the temperature at which a material, such as a polymer, will first start to deform with no externally applied load. For example, the material might become soft, sticky or even begin to change phase from solid to liquid once it reaches or exceeds its softening temperature. While the single layer seal 50 can provide an adequate inner seal for the container 21, the iron heating the seal 50 to attach it to the container 21 must usually be protected (e.g., by the use of wax paper or the like) to prevent the seal 50 from sticking to the iron, thereby complicating the attachment process.

In order to eliminate the above-described material sticking issue with the heating instrument, the seal 50 can be attached to the container 21 by an adhesive about a portion of the outer surfaces 58 of the side panels. The adhesive can be provided as part of the container, as part of the seal, or merely applied at the time of attachment. Or, the portion of the outer surfaces 58 of the side panels might be coated with a sealing polymer, such as polyethylene, which can be heated to its softening point to attach the seal 50 thereto. In this later case, the material forming the seal 50 might have a softening temperature equal to or greater than the softening temperature of the sealing polymer attached to the container 21 but which is still adequate for thermoforming.

With respect to the seal 150, the sealing material 79 preferably has a softening temperature which accommodates attachment of the seal 150 to the container 21 while the thermoformable material has a softening temperature which accommodates thermoforming of the depression 72 therein. The materials 79 and 81 of the seal 150 can be joined before or after the thermoforming process which creates the depression 72. Further, as previously discussed, the seals 50 and 150 can also be attached to the inside of the package 20 or the along the top perimeter 62 of the panels, in which case an adhesive or sealing polymer (both generically illustrated as 83 in Fig. 3b) might be disposed about a portion of the inner surfaces 60 of the panels to facilitate attachment to the container 21.

The sticking of material to the heating instrument can also be alleviated by a seal comprising two or more thermoplastic layers which are (co)extruded and/or laminated on top of each other to form the seal, exemplary tri-layer seals being illustrated in Figs. 4a, 4b and 4c. The seals 250, 350 and 450 comprise a sealing layer 82, an interconnecting layer 84 and a barrier layer 86. As used herein, the phrase "sealing layer" is intended to refer to a layer which bonds layers, materials, or structures together. For example, when the seals 250, 350 and 450 are attached to the container 21, the sealing layer 82 is disposed adjacent to both the outer surface 58 of the side panels as well as the opening 56 of the container 21 so that it can bond or otherwise attach the seals 250 and 350 to the container 21 when the sealing layer is heated to its softening temperature. As used herein, the phrase "barrier layer" is intended to refer to a layer which can withstand the temperature, without softening, melting or becoming sticky, of the instrument heating the seals 250, 350 and 450 when bonding the seals to the container 21. As used herein, the phrase "interconnecting layer" is intended to refer to a layer a which can be thermoformed to form the depression.

The seal 250 is preferably coextruded or laminated, after which this multilayer seal is exposed to the previously described thermoforming process to create the depression 72. As described above, the sealing layer 82 functions as an adhesive and/or sealant for removeably attaching the seal 250 to a portion of the outer surface 58 of the side panels when the sealing layer 82 is exposed to sufficient heat so that it reaches its softening temperature. More preferably, the softening temperature of the sealing layer 82 is less than the softening temperature of the barrier layer 86 so that the sealing layer 82 will physically soften, become sticky or melt such that it bonds to a portion of the outer surface 58 of the side panels without the barrier layer 86 reaching its softening temperature. The softening temperature of the interconnecting layer is preferably greater than or equal to the softening temperature of the sealing layer 82 so that it does not soften or melt when exposed to a temperature sufficient to soften the sealing layer. Thus, the

barrier layer 86 can be exposed to a temperature sufficient to soften or melt the sealing layer 82 without itself softening and/or becoming sticky. In this way the sealing layer 82 can be heated for attachment to the container 21 without the seal 250 attaching to the instrument heating the seal. More preferably, one or more of the layers 82, 84 and/or 86 also resists the passage of air, moisture, chemicals or any other compounds which might undesirably affect the freshness or utility of the product stored in the container 21. It is preferred that the portion of the outer surface 58 of the side panels to which the sealing layer 82 attaches is substantially planar or flat, although it is can also be contoured, in which case the instrument used to heat the seal 250 to attach it to the container 21 would preferably have matching contours to ensure appropriate bonding.

While a depression 172 can be formed in a multilayer seal after the (co)extrusion or laminating together of the various layers, as shown in Fig. 4a, other methods of forming the depression are possible. For example and with reference to the seal 350 of Fig. 4b, the depression can first be formed in the interconnecting layer 84 (or other layers) using a thermoforming process prior to laminating the barrier layer 86 and the sealing layer 82 to the interconnecting layer 84. So that the relatively planar sealing layer 82 (which did not go through a thermoforming process) can accommodate the depression which forms part of the interconnecting layer 84, a cut-out or hole 88 the same size or larger than the size of the footprint of the depression is formed within the sealing layer 86. The depression 272 extends through the hole 88 when the interconnecting layer 84 is attached to the sealing layer 82. Another hole 90 is provided in the barrier layer 86 so that the scoop 64 can pass therethrough and into the depression 272 for storage. As will be appreciated the size and shape of the holes 88 and 90 can be varied and the edges of the holes need not abut the depression 272. In fact, the edges can be placed closer to the inner surfaces 60 of the side panels if desired. Likewise, the outer edges of the interconnecting layer 84 need not extend all the way to the side panels of the container 21.

While only 3 layers are illustrated in Figs. 4a, 4b and 4c, additional layers can be provided if desired. For instance, more than one sealing layer can be provided, wherein the material used for the sealing layer is selected based upon the materials which are being bonded or attached by that sealing layer (e.g., bonding polymer to polymer or polymer to cartonboard). Thus, a seal 450 (Fig. 4c) might have a sealing layer 82 (e.g., ethylene vinyl acetate) for bonding the seal 450 to the container 21, a sealing layer 182 (e.g., low density polyethylene) for bonding the sealing layer 82 with the interconnecting layer 84 (e.g., linear low density polyethylene) and a sealing layer 182 bonding the interconnecting layer 84 to the barrier layer 86 (e.g, cast polypropylene). In addition, the order of the layers might be changed while still providing the

desired functionality. The seal 550 of Fig. 4d illustrates a tri-layer configuration wherein the sealing layer 82 and barrier layer 84 are disposed adjacent to each other rather than separated as with seal 250.

Referring to Figs. 5a and 5b, exemplary bi-layer seals 450 and 550 are illustrated. These seals can be formed similar as the tri-layer seals, wherein the seals 450 and 550 have a sealing layer 82 and a barrier layer 86. The barrier layer 86 is also preferably thermodeformable so that the depressions 372 and 472 can be formed therein. The softening temperature of the barrier layer of the seals 450 and 550 is preferably equal to or greater than the softening temperature of the sealing layer 82 of the seals 450 and 550 so that that the sealing layer can be heated to its softening temperature without the barrier layer attaching to the heating instrument.

More preferably, the sealing layers 82 comprise ethylene vinyl acetate (EVA) or polyolefin, the interconnecting layers 84 comprise linear low density polyethylene (LLDPE) and the barrier layers 86 comprise cast polypropylene (CPP) or low density polyethylene (LDPE). In order to achieve the proper processing, sealing and barrier properties, the overall thickness before thermoforming of the seal is preferably between about 50 microns and about 300 microns, and, more preferably, between about 100 and about 150 microns. Most preferably, the seals 250 and 350 have a sealing layer comprising polyolefin (about 30 microns in thickness), an interconnecting layer comprising LLDPE (about 80 microns in thickness), and a barrier layer comprising LDPE (about 20 microns in thickness), wherein the LLDPE and LDPE layers are coextruded and the polyolefin layer is laminated to the LLDPE layer. The sealing layer comprising polyolefin can be thermoformed at a temperature between about 45C and about 250C and, more preferably, between about 45C and about 130C. This sealing layer is heated to between about 80C and about 300C and, more preferably, between about 100C and about 250C to attach or bond the sealing layer to the container 21 of a package.

It will be appreciated that the above-described most preferred materials for forming the sealing, interconnecting and barrier layers can be blended with other polymers or compounds without degrading the properties of the seal. Other polymers can be used for the barrier and sealing layers. For example, the sealing layer 82 can also be formed from an ionomer, an ethylene-ethyl acrylate copolymer, or low density polyethylene (LDPE) while the barrier layer 86 can be formed from polyethylene (PE), polyethylene terephthalate (PET) or Nylon (e.g., Nylon 6, Nylon 6/66 copolymer, Nylon 6/12 copolymer, Nylon 66 or Nylon 12). The interconnecting layer can also be formed from Nylon or PET.

It is preferred that the seals of the present are attached to the container 21 by heating the sealing layer adjacent to the container 21. However, as previously discussed, it will be

understood that the seals can also be attached using adhesive which is disposed on either the seal or the container 21. In addition, while it is preferred that the seals are attached as a multilayer unit to the container 21, it is contemplated that the layers can be attached separately. For example, the sealing layer can be first attached to the container 21 by heating or use of an adhesive and then the barrier layer (after thermoforming) can be attached to a sealing layer by heating the two layers or by the use of an adhesive.

The foregoing description of the preferred embodiments of the invention have been presented for purposes of illustration and description. It is not intended to be exhaustive or to limit the invention to the precise form disclosed. Modifications or variations are possible and contemplated in light of the above teachings by those skilled in the art, and the embodiments discussed were chosen and described in order to best illustrate the principles of the invention and its practical application. It is intended that the scope of the invention be defined by the claims appended hereto.

WHAT IS CLAIMED IS:

1. A package for a product, characterized by:
 - a container for storing the product which has an opening through which the product can be removed during use, wherein said opening is defined in part by a side panel of said container;
 - a lid attached to said container by a hinge, said lid closing said opening when said lid is in a closed position; and
 - a seal extending across said opening to prevent escape of the product from said container, said seal having a depression therein for receiving at least a portion of a utensil.
2. The package according to any of the preceding claims, further characterized by a utensil disposed within said depression.
3. The package according to any of the preceding claims, wherein said container comprises four interconnected panels and a base interconnected with each of said panels and wherein said opening is disposed opposite said base.
4. The package according to any of the preceding claims, wherein said seal is formed from a plurality of layers.
5. The package according to any of the preceding claims, wherein said seal comprises a sealing layer for attaching to said seal to said container.
6. The package according to any of the preceding claims, wherein said seal further comprises a barrier layer attached to said sealing layer, said barrier layer having a softening temperature equal to or greater than the softening temperature of said sealing layer.
7. The package according to any of the preceding claims, wherein said seal further comprises an interconnecting layer disposed between said sealing layer and said barrier layer, said interconnecting layer joining said barrier layer and said sealing layer.

8. The package according to any of the preceding claims, wherein said sealing layer comprises ethylene vinyl acetate, polyolefin, ionomer, or ethylene-ethyl acrylate copolymer.
9. The package according to any of the preceding claims, wherein said barrier layer comprises cast polypropylene, low density polyethylene, nylon or polyethylene terephthalate.
10. The package according to any of the preceding claims, wherein said interconnecting layer comprises linear low density polyethylene, nylon or polyethylene terephthalate.

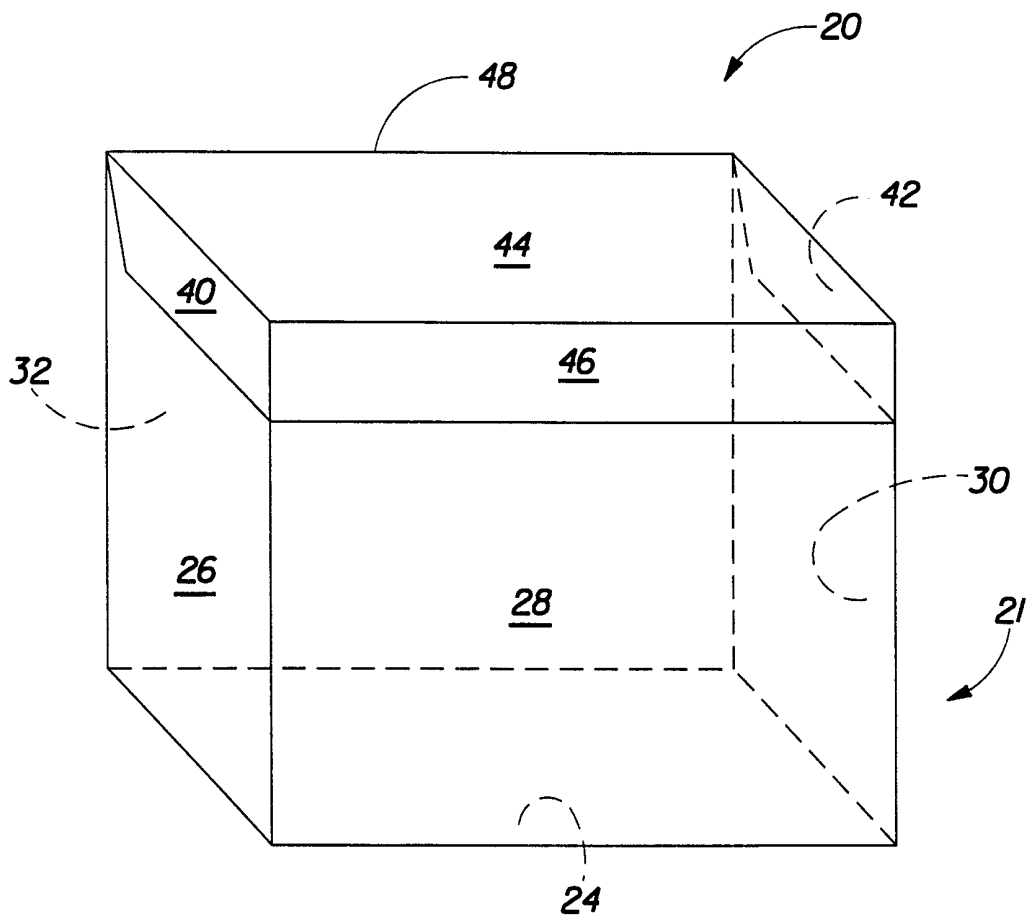


FIG.1

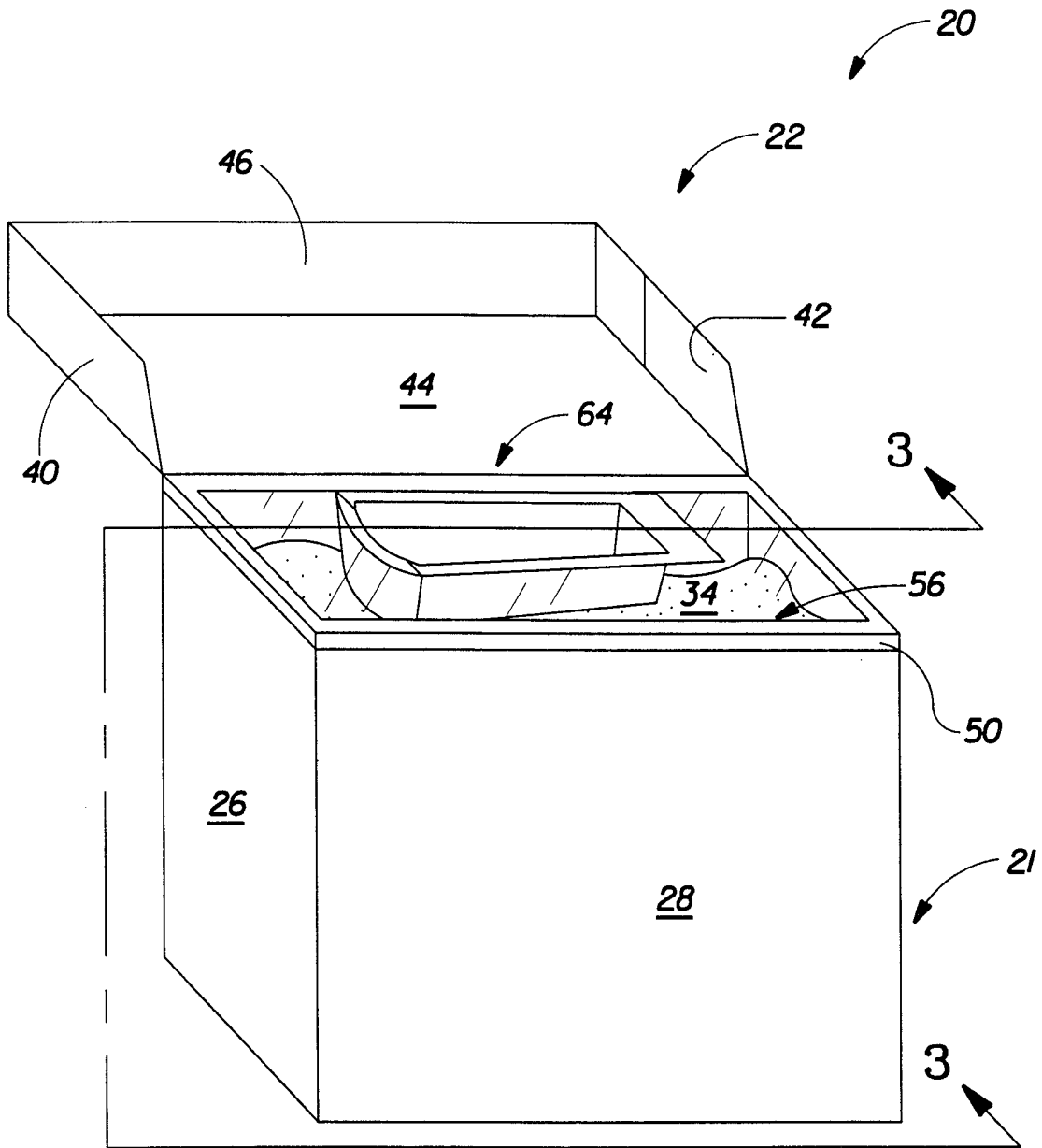


FIG.2

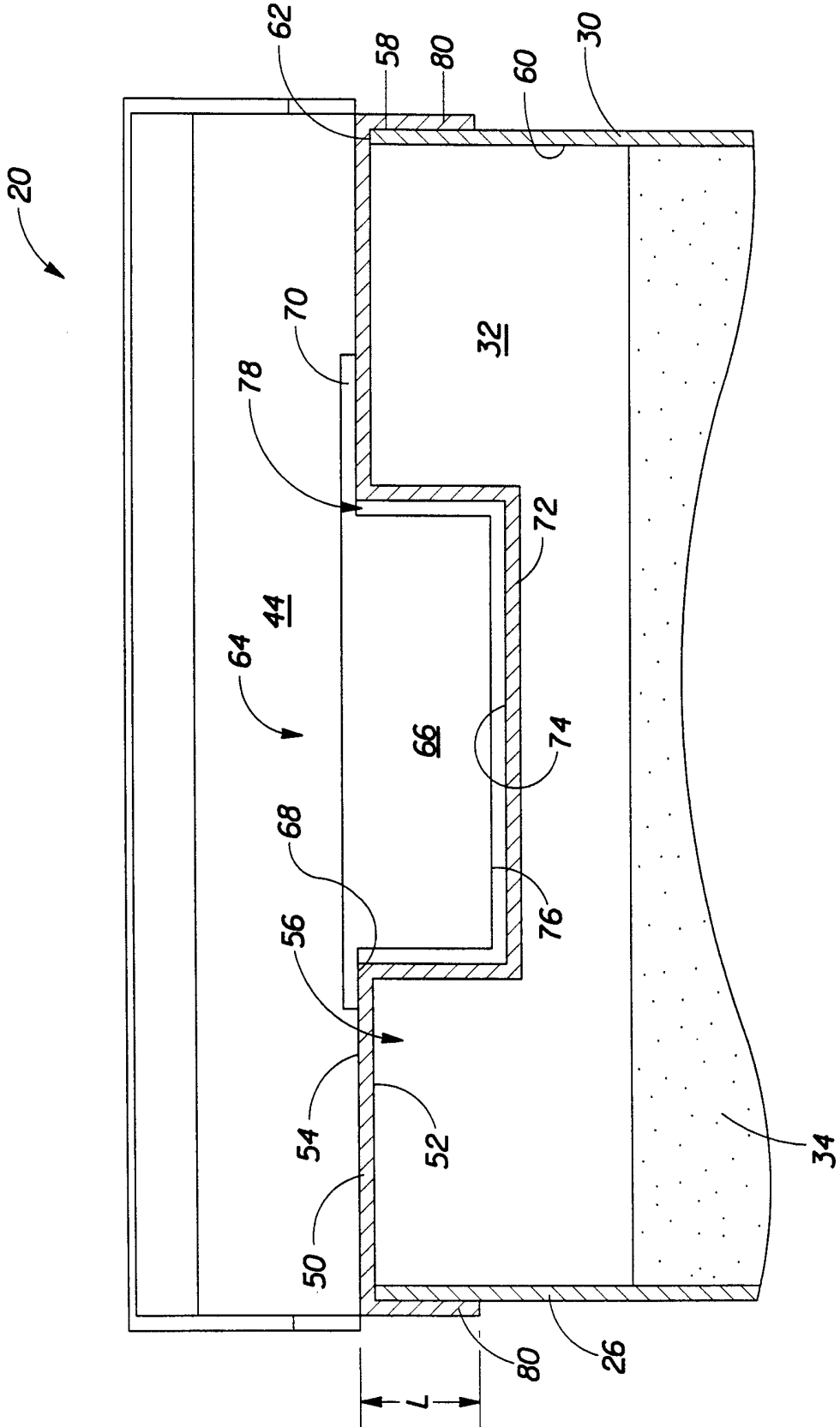


FIG.3A

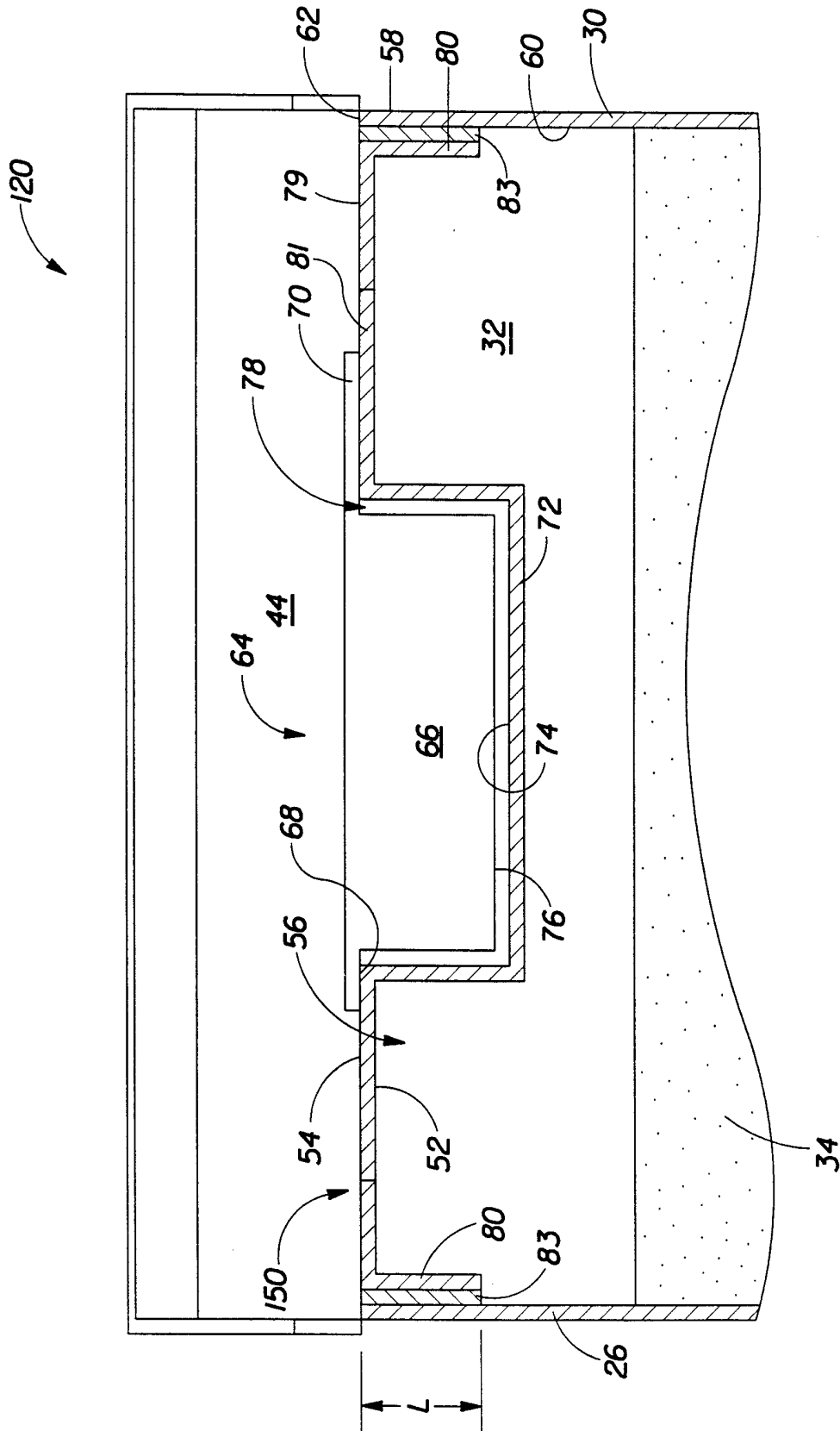


FIG.3B

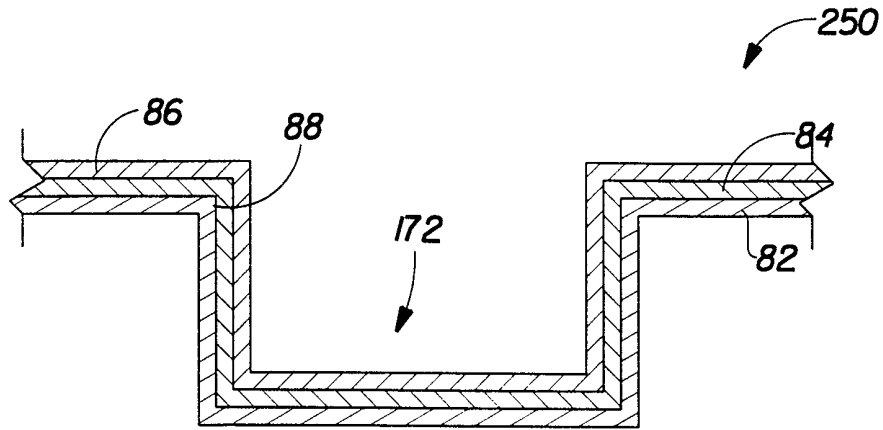


FIG. 4A

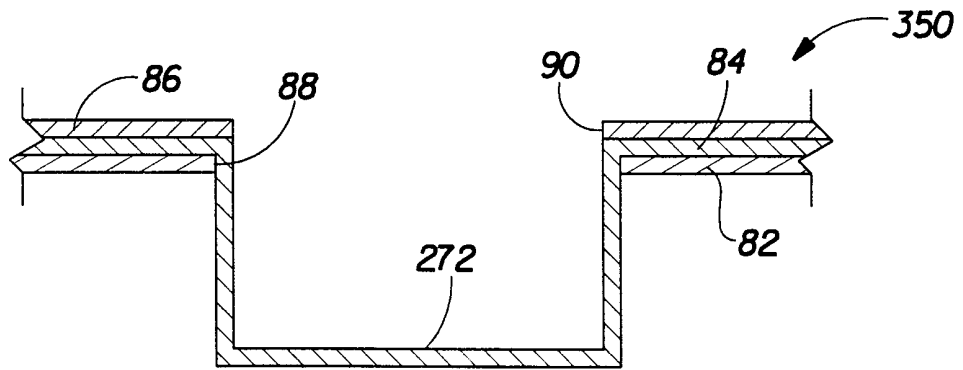


FIG. 4B

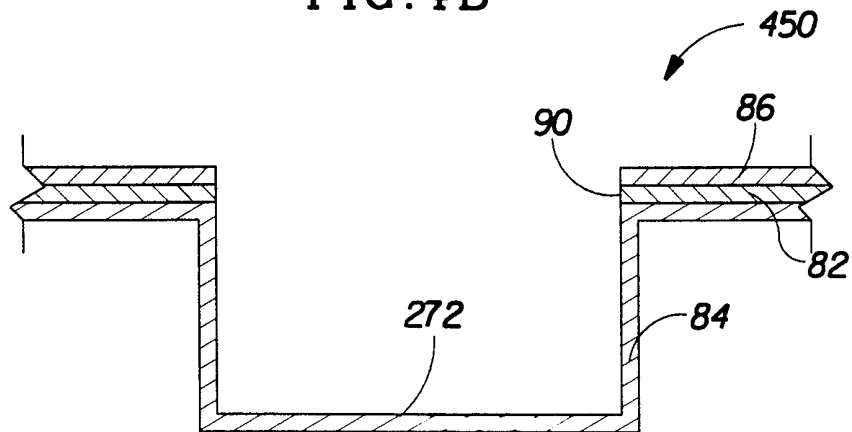


FIG. 4C

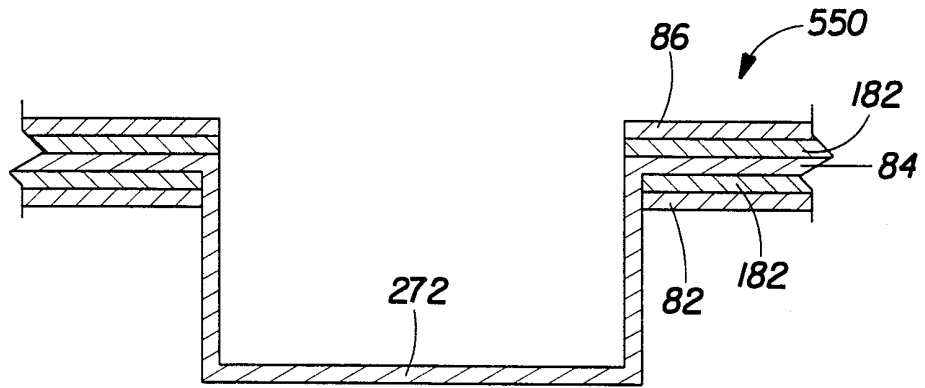


FIG. 4D

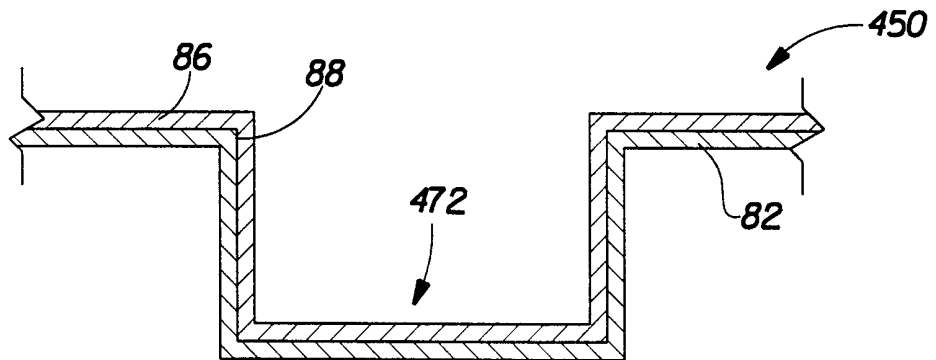


FIG. 5A

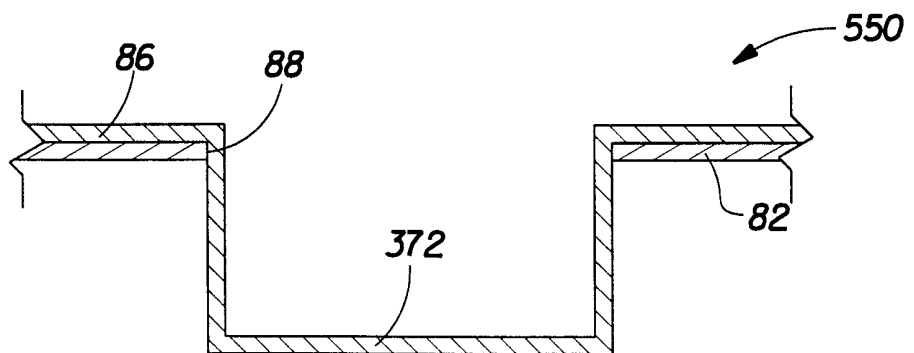


FIG. 5B

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/05293

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B65D77/24

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)

IPC 7 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 practical, 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.
Y	US 5 711 476 A (NANNO YUKIO ET AL) 27 January 1998 (1998-01-27) column 3, line 51 - line 67; figures 2,4 ---	1-10
Y	WO 98 46494 A (GOGLIO LUIGI) 22 October 1998 (1998-10-22) cited in the application page 4, line 1 - line 17; figures 2,3 ---	1-10
A	US 3 112 855 A (HENNESSEY ET AL.) 3 December 1963 (1963-12-03) claim 1; figure 2 --- -/--	1,3

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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Date of the actual completion of the international search

22 June 2000

Date of mailing of the international search report

30/06/2000

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Bridault, A

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/05293

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A,P	EP 0 941 935 A (PROCTER & GAMBLE) 15 September 1999 (1999-09-15) column 9, line 26 - line 35 column 12, line 39 -column 13, line 4 column 15, line 37 - line 58; figures 10,11,24 <p style="text-align: center;">-----</p>	1-3

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 00/05293

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WO 9846494	A	22-10-1998	IT MI970261 U	12-10-1998
			AU 6616798 A	11-11-1998
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EP 0941935	A	15-09-1999	WO 9946171 A	16-09-1999