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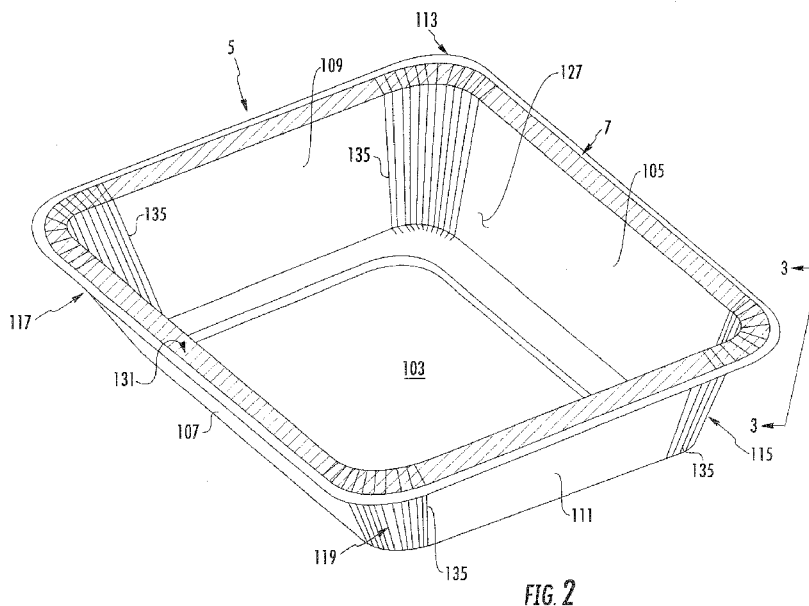
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(54) Title: CONTAINER WITH COATING



(57) Abstract: A container for holding an article. The container can comprise a wall and a flange extending from the wall. The wall can at least partially define a cavity of the container. At least one pleat can extend in at least the flange, and a coating can be on at least a portion of the flange. The coating can at least partially cover the at least one pleat and can form a substantially continuous sealing surface on the flange.



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CONTAINER WITH COATING**CROSS-REFERENCED TO RELATED APPLICATIONS**

[0001] This application claims the benefit of U.S. Provisional Patent Application No. 62/121,680, filed on February 27, 2015.

INCORPORATION BY REFERENCE

[0002] The disclosure of U.S. Provisional Patent Application No. 62/121,680, which was filed on February 27, 2015, is hereby incorporated by reference for all purposes as if presented herein in its entirety.

BACKGROUND OF THE DISCLOSURE

[0003] The present disclosure relates to blanks, containers, trays, constructs, and various features to facilitate forming a container from a blank.

SUMMARY OF THE DISCLOSURE

[0004] In one aspect, the disclosure is generally directed to a container for holding an article. The container can comprise a wall and a flange extending from the wall. The wall can at least partially define a cavity of the container. At least one pleat can extend in at least the flange, and a coating can be on at least a portion of the flange. The coating can at least partially cover the at least one pleat and can form a substantially continuous sealing surface on the flange.

[0005] In another aspect, the disclosure is generally directed to a blank for forming a container for holding an article. The blank can comprise a wall portion and a flange portion for forming a respective wall and flange of a container formed from the blank. At least one score line can be for forming at least one pleat extending in at least the flange when the blank is formed into the container. The at least one score line can extend in at least the flange portion. A coating can be on at least a portion of the flange portion. The coating can be at least partially covering the at least one score line and can form a substantially continuous sealing surface on the flange in the container formed from the blank.

[0006] In another aspect, the disclosure is generally directed to a method of forming a container from a blank. The method can comprise obtaining a blank having a wall portion, a flange portion, and a coating on at least a portion of the flange portion. At least one score line can extend at least partially in the flange portion, and the coating can be at least partially covering the at least one score

line. The method further can comprise forming the container from the blank by forming a wall of the container from the wall portion and forming a flange of the container from the flange portion. The flange can extend from the wall. The forming the container further can comprise forming the at least one score line into at least one pleat in at least the flange. The coating can at least partially cover the at least one pleat to form a substantially continuous sealing surface of the container on the flange.

[0007] Those skilled in the art will appreciate the above stated advantages and other advantages and benefits of various additional embodiments reading the following detailed description of the embodiments with reference to the below-listed drawing figures.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] According to common practice, the various features of the drawings discussed below are not necessarily drawn to scale. Dimensions of various features and elements in the drawings may be expanded or reduced to more clearly illustrate the embodiments of the disclosure.

[0009] Fig. 1 is a plan view of a blank used for forming a container according to a first embodiment of the disclosure.

[0010] Fig. 2 is a perspective view of the container formed from the blank of Fig. 1.

[0011] Fig. 3 is a schematic partial elevation view of the container indicated by line 3-3 in Fig. 2 showing a corner of the container and a detail of the flange.

[0012] Fig. 4 is a perspective view of the container of Fig. 2 with a lid applied to the flange of the container according to the first embodiment of the disclosure.

[0013] Fig. 5 is a schematic partial elevation view of the container indicated by line 5-5 in Fig. 4 showing a corner of the container and the lid.

[0014] Fig. 6 is a plan view of a lid used for being attached to a container according to a second embodiment of the disclosure.

[0015] Fig. 7 is a schematic partial elevation view of a corner of a container with the lid of Fig. 6 attached to a flange of the container according to the second embodiment of the disclosure.

[0016] Figs. 8 and 9 are schematic views of an exemplary forming tool for forming a container according to an exemplary embodiment.

[0017] Corresponding parts are designated by corresponding reference numbers throughout the drawings.

DETAILED DESCRIPTION OF THE EXEMPLARY EMBODIMENTS

[0018] The present disclosure relates generally to various aspects of containers, constructs, trays, materials, packages, elements, and articles, and methods of making such containers, constructs, trays, materials, packages, elements, and articles. Although several different aspects, implementations, and embodiments are disclosed, numerous interrelationships between, combinations thereof, and modifications of the various aspects, implementations, and embodiments are contemplated hereby. In one illustrated embodiment, the present disclosure relates to forming a container or tray for holding food items or various other articles. However, in other embodiments, the container or tray can be used to form other non-food containing articles or may be used for heating or cooking.

[0019] Fig. 1 illustrates a blank 3 that is used to form a container 5 (Figs. 2-5) having a flange 7 according to a first embodiment of the disclosure. In the illustrated embodiment, the blank 3 is generally rectangular and has generally straight side edges 9, 11 and straight end edges 13, 15 with rounded corners 17, 19, 21, 23 extending between respective side edges and end edges. The blank 3 is for being press formed into the container 5 that, in the illustrated embodiment, is a generally rectangular tray. It is understood that the blank 3 can be press-formed into the container 5 by a forming tool T (shown schematically in Figs. 8 and 9 by way of example), which can be similar to and have similar features and/or components as conventional forming tools such as are disclosed in U.S. Patent No. 8,534,460, the entire contents of which are incorporated herein by reference for all purposes. Also, the forming tool can have similar features and components such as the forming tool disclosed in U.S. Pat. No. 8,801,995, the entire contents of which are incorporated by reference for all purposes, or any other suitable forming tool assembly. The blank 3 and the container 5 could be alternatively shaped (e.g., circular, oval, rectangular, annular, irregular, etc.) and/or any suitable forming tool could be used to form the container 5 from the blank 3 without departing from the scope of this disclosure.

[0020] The blank 3 can be formed from a single ply of material, such as but not limited to paperboard, cardboard, paper, or a polymeric sheet, but alternatively, the blank can be formed from a laminate that includes more than one layer. In one embodiment, the blank 3 can include a microwave interactive layer such as is common in MicroRite® containers available from Graphic Packaging International of Marietta, GA. The microwave interactive layer can be commonly referred to as, or can have as one of its components, a foil, a microwave shield, or any other term or component that

refers to a layer of material suitable for shielding microwave energy and/or causing heating in a microwave oven.

[0021] As shown in Fig. 1, the blank 3 has a longitudinal direction L1 and a lateral direction L2, with the side edges 9, 11 extending in the longitudinal direction L1 and the end edges 13, 15 extending in the lateral direction L2. The blank 3 has a central portion 27 (i.e., bottom panel portion or bottom portion), two opposed side portions 29, 31 (i.e., side panel portions or side wall portions), and two opposed end portions 33, 35 (i.e., end panel portions or end wall portions). In one embodiment, four corner portions 37, 39, 41, 43 are between adjacent respective side portions 29, 31 and end portions 33, 35. The blank 3 includes a flange portion 44, which includes a marginal edge portion of the blank that includes the side edges 9, 11, the end edges 13, 15, and the corner edges 17, 19, 21, 23. The flange portion 44 extends across the side portions 29, 31, end portions 33, 35 and corner portions 37, 39, 41, 43. Each corner portion 37, 39, 41, 43 comprises a plurality of score lines 49. In the illustrated embodiment, each corner portion 37, 39, 41, 43 comprises ten score lines, but the corner portions could comprise more or less than ten score lines without departing from the disclosure. Further, the blank 3 could be generally circular, with score lines around the entire circumference of the blank without departing from the disclosure. As shown in Fig. 1, the corner portions 37, 39, 41, 43 form a transition area between respective side portions 29, 31 and end portions 33, 35. Accordingly, the side portions 29, 31, the end portions 33, 35, and the corner portions 37, 39, 41, 43 can form a wall portion that extends continuously around the central portion 27 in one embodiment. Further, in one exemplary embodiment, the flange portion 44, which includes the outer edges 9, 19, 15, 23, 11, 21, 13, 17, can extend continuously around the perimeter of the blank 3.

[0022] In one embodiment, the score lines 49 extend across the corner portions 37, 39, 41, 43 and into the flange portion 44 extending around each corner portion. Each score line 49 has an outer end 51 that is spaced apart from a respective outer edge 17, 19, 21, 23 of the blank, but the score lines could extend to the edge of the blank without departing from the disclosure. Also, in one embodiment, the score lines 49 are formed on the interior surface 12 of the blank 3 such that the score lines 49 comprise slight indentations in the interior surface of the blank. In the illustrated embodiment, each of the score lines terminates at an inner end 53 that approximately corresponds to the transition between the respective corner portions 37, 39, 41, 43 and the bottom portion 27 of the blank. Alternatively, the score lines 49 could extend into the bottom portion 27 without departing from the disclosure. Further, in the illustrated embodiment, the score lines 49 are all approximately the same length, with some of the score lines being in the longitudinal direction L1, some of the score lines being in the lateral direction L2, and some of the score lines being oblique relative to the

longitudinal and lateral directions. The score lines could be otherwise shaped, arranged, configured, and/or positioned without departing from the disclosure. For example, the score lines 49 could be of different lengths or could be otherwise positioned at various angles to facilitate forming the container 5 without departing from the disclosure.

[0023] Figs. 2-5 show one embodiment of the disclosure comprising a container 5 formed from the blank 3. The container 5 comprises a bottom wall 103, side walls 105, 107, end walls 109, 111, and corners 113, 115, 117, 119 connecting respective adjacent side walls 105, 107 and end walls 109, 111. In one embodiment, the side walls 105, 107, the end walls 109, 111, and the corners 113, 115, 117, 119 generally form a wall that extends around the container 5. The flange 7 extends outwardly from respective side walls 105, 107, the end walls 109, 111, and the corners 113, 115, 117, 119 (e.g., the flange 7 extends outwardly from the wall of the container 5) and extends continuously around the perimeter of the container 5. The bottom wall 103 is formed from the bottom portion 27 of the blank. In addition, the side walls 105, 107 are formed from respective side portions 29, 31 of the blank, the end walls 109, 111 are formed from respective end portions 33, 35 of the blank, and the corners 113, 115, 117, 119 are formed from the respective corner portions 37, 39, 41, 43 (e.g., the wall of the container 5 is formed from the wall portion of the blank 3). The container 5 has a cavity 127 or interior space that is defined by the bottom wall 103, the side walls 105, 107, the end walls 109, 111, and the corners 113, 115, 117, 119 extending upwardly from the bottom wall 103. In the illustrated embodiment, the side walls 105, 107, the end walls 109, 111, and the corners 113, 115, 117, 119 extend continuously around the cavity 127. The container 5 is for holding and/or cooking and/or heating a food product (not shown) that is placed in the interior space 127 of the container.

[0024] As shown in Figs. 1 and 2, the blank 3 and the container 5 include a coating 131 that extends around the perimeter of the blank and the container in the flange region 44 and the flange 7. Alternatively, the coating 131 could be disposed on the portions of the flange region 44 including the score lines 49 (e.g., along and adjacent the corner portions 37, 39, 41, 43) and the portions of the flange region 44 extending along the side portions 29, 31 and end portions 33, 35 that do not include score lines could be free of the coating 131 without departing from the disclosure. As shown in Figs. 1 and 2, the coating 131 is shown as a cross-hatched area that at least partially covers the flange region 44 and the flange 7, but the coating could be a transparent or translucent film or opaque layer without departing from the disclosure. As shown in the figures, the coating 131 covers a portion of the flange region 44 and the flange 7 and is spaced from the outer edge of the flange. Also, in the illustrated embodiment, the wall of the container 5 is free from contact with the coating 131, and the coating 131 is spaced apart from the bottom wall 103. Alternatively, the coating 131 could cover the entire flange 7 or could cover a different portion of the flange without departing from the disclosure.

Further, the coating 131 could extend onto the side walls 105, 107, the end walls 109, 111, the corners 133, 115, 117, 119, and/or other parts of the container 5 without departing from the scope of the disclosure. In one embodiment, the coating 131 can be amorphous polyester, urethane, epoxy, acrylics, another suitable polymer, or any other suitable material.

[0025] In one embodiment, the coating 131 can be applied to the material (e.g., web) from which the blank 3 is formed prior to die-cutting the blank 3 from the web of material. Alternatively, the coating 131 could be applied to the blank 3 after it is die cut from the web without departing from the disclosure. In one embodiment, the material selected for the coating 131 is printable and can be applied by screen printing, flexography, die-cutting/appliques, or other suitable application techniques. The coating 131 can have a thickness of approximately 1-2 mils, or the coating could have a thickness that is more or less than approximately 1-2 mils without departing from the disclosure.

[0026] In one embodiment, when the blank 3 is press-formed into the container 5 by way of the forming tool T (Figs. 8 and 9) or other suitable method, the score lines 49 form overlapped portions or pleats 135 (Figs. 3 and 5). For example, in one embodiment, portions of the blank material can be gathered at the score lines 49 and pressed against the blank (e.g., by the forming tool T) in order to form the pleats 135. The pleats 135 could be otherwise formed without departing from the disclosure. In the illustrated embodiment, the overlapped portions 135 are in the flange 7 of the container 5 and the corners 113, 115, 117, 119, but the overlapped portions 135 could be otherwise arranged in the carton such as in one or more of the side walls 105, 107 and/or end walls 109, 111. As noted above, the tray 5 could be other shapes, such as circular, and the overlapped portions or pleats 135 could extend around the entire perimeter of the tray without departing from the disclosure.

[0027] As is schematically shown in Fig. 3, the overlapped portions 135 have a portion 137 of the coating 131 between the two portions of material 141, 143 that form the overlapped portion 135. In one embodiment, when the blank 3 is press-formed into the container 5, the portions of material 141, 143 extending along each of the score lines 49 can fold against one another at the respective score line 49 with a portion 137 of the coating 131 disposed between the portions of material 141, 143. In the schematic of Fig. 3, the pleats 135 are shown as generally symmetric with the portions of material 141, 143 and the portion 137 extending generally downwardly from the flange 7. However, any of the pleats 135 could be symmetric or asymmetric and/or the portions of material 141, 143 could extend in a different direction without departing from the disclosure. For example, the portions of material 141, 143 can be pressed against the flange 7 and/or the wall of the container 5 by the forming tool T as the container 5 is press formed.

[0028] Since, as shown in Fig. 3, the coating 131 covers the score lines 49 of the blank 3 before the carton 5 is formed, the coating 131 fills the gap between the portions 141, 143 of material that form the pleats 135. The coating 131 also has a top portion 145 that forms a top surface 147 of the flange 7 that is substantially continuous. In one embodiment, the top surface 147 of the flange 7 is substantially flat, but the top surface may be contoured without departing from the disclosure. The coating 131 covers and seals the pleats 135 to provide a sealing surface 147 of the flange 7 to allow a lid 151 (Figs. 4 and 5) in the form of a plastic layer or film (e.g., a lidding film) to be attached to the flange 7 to enclose the cavity 127 of the container 5 (Fig. 4). Because the sealing surface 147 is a continuous surface formed by the coating 131, the lid 151 can be sealed or bonded to the flange 7 of the tray 5 to keep the contents of the tray fresh by providing a moisture- and/or air-tight seal between the lid 151 and the sealing surface 147 of the flange 7. The corner 115 of the tray 5 is shown in Figs. 3 and 5, but the other corners 113, 117, 119 are similarly configured. Also, if additional score lines 49 are provided to form pleats in one or more of the side walls 105, 107 and/or end walls 109, 111, the flange can have a similar configuration as depicted in Figs. 3 and 5 with the coating 131 filling the gap between the pleats 135 and forming a sealing surface 147 of the flange. In addition, the coating 131 can provide a sealing surface 147 along portions of the flange 7 that do not include pleats. The flange 7 and/or sealing surface 147 could be otherwise shaped, arranged, and/or configured without departing from the disclosure.

[0029] In one embodiment, the lid 151 comprises packaging film that is a plastic layer used to preserve and protect a food item contained in the tray. Any plastic film, such as polystyrene, polyethylene, polypropylene, polyethylene terephthalate, polyvinylchloride, polyamide, and ethylene vinyl alcohol, or other suitable material, can be used. In one example, the lidding film is a polystyrene film and the coating 131 comprises amorphous polyester, urethane, epoxy, and/or acrylics. Any other suitable material can be used for forming the lid 151 that is sealed against the sealing surface 147 of the flange 7. In one embodiment, the lid 151 can be sealed against the sealing surface 147 by pressing the lid 151 against the flange 7, heat welding, ultrasonic welding, and/or any other suitable sealing method. Further, adhesives can be used between the lid 151 and the sealing surface 147 without departing from the disclosure.

[0030] Fig. 6 is a plan view of an interior surface 350 of a lid 351 for being attached to a container 205 (Fig. 7) according to an alternative embodiment of the disclosure. The alternative embodiment is generally similar to the first embodiment, except for variations noted and variations that will be apparent to one of ordinary skill in the art. Accordingly, similar or identical features of the embodiments have been given like or similar reference numbers. As shown in Fig. 6, the lid 351 can include a marginal region 353 extending around a central region 355. A coating 331, similar or

identical to the coating 131 of the first embodiment, can extend around the perimeter of the lid 351 in at least the marginal region 353 (as shown schematically in Fig. 6 by crosshatching). As shown schematically in Fig. 7, the lid 351 with the coating 331 can be attached to the flange 207 of the carton 205 with the coating 331 therebetween. Accordingly, the coating 331 has an upper portion 345 that can form a substantially continuous surface 347 at the lid 351 and has portions 337 that can at least partially fill in any indentations or other features in the flange 207 at the pleats 135 to help form a moisture- and/or air-tight seal between the lid 351 and the flange 207 around the perimeter of the container 205. Since the container 205 was press-formed without the coating 131 of the first embodiment, the portions 337 might not extend all the way between the portions of material 141, 143 that form the pleats in one embodiment. The lid 351, the coating 331, and/or the container 205 could be shaped, arranged, configured, and/or positioned without departing from the disclosure. For example, the coating 331 could cover more or less of the lid 351 than what is shown in Fig. 6.

[0031] In one embodiment, the blank 3 is formed into the container by conveying a blank and placing the blank in the forming tool T (schematically shown in Figs. 8 and 9 by way of example) with a lower tool assembly L and upper tool assembly U in a separated or open position. The forming tool T is used to press form the blank 3 into the container 5 by moving the tool assemblies L, U together, to a closed position (Fig. 8, for example). After press-forming the container 5, the tool assemblies L, U can be separated (Fig. 9, for example) to release the container 5. When the flat blank 3 is pressed in the forming tool T, pleats 135 or overlapped portions form at the score lines 49 in the blank. The score lines 49 facilitate forming the flat blank 3 into the three-dimensional container 5 in the forming tool T. The container 5 could be otherwise formed and/or could be formed by any suitable forming tool or forming tools without departing from the disclosure. The forming tool T shown schematically in Figs. 8 and 9 is included by way of example only.

[0032] Any of the features of the various embodiments of the disclosure can be combined with, replaced by, or otherwise configured with other features of other embodiments of the disclosure without departing from the scope of this disclosure. For example, the lid 351 with the coating 331 of the second embodiment can be attached to the flange 7 of the container 5 with the coating 131 of the first embodiment to enclose the cavity 127 of the container 5.

[0033] Optionally, one or more portions of the blank or other constructs described herein or contemplated hereby may be coated with varnish, clay, or other materials, either alone or in combination. The coating may then be printed over with product advertising or other information or images. The blanks or other constructs also may be selectively coated and/or printed so that less than the entire surface area of the blank or substantially the entire surface area of the blank may be coated and/or printed.

- [0034] Any of the blanks, containers, or other constructs of this disclosure may optionally include one or more features that alter the effect of microwave energy during the heating or cooking of a food item that is associated with the tray or other construct. For example, the blank, tray, container, or other construct may be formed at least partially from one or more microwave energy interactive elements (hereinafter sometimes referred to as "microwave interactive elements") that promote heating, browning and/or crisping of a particular area of the food item, shield a particular area of the food item from microwave energy to prevent overcooking thereof, or transmit microwave energy towards or away from a particular area of the food item. Each microwave interactive element comprises one or more microwave energy interactive materials or segments arranged in a particular configuration to absorb microwave energy, transmit microwave energy, reflect microwave energy, or direct microwave energy, as needed or desired for a particular construct and food item.
- [0035] In the case of a susceptor or shield, the microwave energy interactive material may comprise an electroconductive or semiconductive material, for example, a vacuum deposited metal or metal alloy, or a metallic ink, an organic ink, an inorganic ink, a metallic paste, an organic paste, an inorganic paste, or any combination thereof. Examples of metals and metal alloys that may be suitable include, but are not limited to, aluminum, chromium, copper, inconel alloys (nickel-chromium-molybdenum alloy with niobium), iron, magnesium, nickel, stainless steel, tin, titanium, tungsten, and any combination or alloy thereof.
- [0036] Alternatively, the microwave energy interactive material may comprise a metal oxide, for example, oxides of aluminum, iron, and tin, optionally used in conjunction with an electrically conductive material. Another metal oxide that may be suitable is indium tin oxide (ITO). ITO has a more uniform crystal structure and, therefore, is clear at most coating thicknesses.
- [0037] Alternatively still, the microwave energy interactive material may comprise a suitable electroconductive, semiconductive, or non-conductive artificial dielectric or ferroelectric. Artificial dielectrics comprise conductive, subdivided material in a polymeric or other suitable matrix or binder, and may include flakes of an electroconductive metal, for example, aluminum.
- [0038] In other embodiments, the microwave energy interactive material may be carbon-based, for example, as disclosed in U.S. Patent Nos. 4,943,456, 5,002,826, 5,118,747, and 5,410,135.
- [0039] In still other embodiments, the microwave energy interactive material may interact with the magnetic portion of the electromagnetic energy in the microwave oven. Correctly chosen materials of this type can self-limit based on the loss of interaction when the Curie temperature of the material is reached. An example of such an interactive coating is described in U.S. Patent No. 4,283,427.

[0040] The use of other microwave energy interactive elements is also contemplated. In one example, the microwave energy interactive element may comprise a foil or high optical density evaporated material having a thickness sufficient to reflect a substantial portion of impinging microwave energy. Such elements typically are formed from a conductive, reflective metal or metal alloy, for example, aluminum, copper, or stainless steel, in the form of a solid "patch" generally having a thickness of from about 0.000285 inches to about 0.005 inches, for example, from about 0.0003 inches to about 0.003 inches. Other such elements may have a thickness of from about 0.00035 inches to about 0.002 inches, for example, 0.0016 inches.

[0041] In some cases, microwave energy reflecting (or reflective) elements may be used as shielding elements where the food item is prone to scorching or drying out during heating. In other cases, smaller microwave energy reflecting elements may be used to diffuse or lessen the intensity of microwave energy. One example of a material utilizing such microwave energy reflecting elements is commercially available from Graphic Packaging International, Inc. (Marietta, GA) under the trade name MicroRite® packaging material. In other examples, a plurality of microwave energy reflecting elements may be arranged to form a microwave energy distributing element to direct microwave energy to specific areas of the food item. If desired, the loops may be of a length that causes microwave energy to resonate, thereby enhancing the distribution effect. Microwave energy distributing elements are described in U.S. Patent Nos. 6,204,492, 6,433,322, 6,552,315, and 6,677,563, each of which is incorporated by reference in its entirety.

[0042] If desired, any of the numerous microwave energy interactive elements described herein or contemplated hereby may be substantially continuous, that is, without substantial breaks or interruptions, or may be discontinuous, for example, by including one or more breaks or apertures that transmit microwave energy. The breaks or apertures may extend through the entire structure, or only through one or more layers. The number, shape, size, and positioning of such breaks or apertures may vary for a particular application depending on the type of construct being formed, the food item to be heated therein or thereon, the desired degree of heating, browning, and/or crisping, whether direct exposure to microwave energy is needed or desired to attain uniform heating of the food item, the need for regulating the change in temperature of the food item through direct heating, and whether and to what extent there is a need for venting.

[0043] By way of illustration, a microwave energy interactive element may include one or more transparent areas to effect dielectric heating of the food item. However, where the microwave energy interactive element comprises a susceptor, such apertures decrease the total microwave energy interactive area, and therefore, decrease the amount of microwave energy interactive material available for heating, browning, and/or crisping the surface of the food item. Thus, the relative

amounts of microwave energy interactive areas and microwave energy transparent areas may be balanced to attain the desired overall heating characteristics for the particular food item.

[0044] As another example, one or more portions of a susceptor may be designed to be microwave energy inactive to ensure that the microwave energy is focused efficiently on the areas to be heated, browned, and/or crisped, rather than being lost to portions of the food item not intended to be browned and/or crisped or to the heating environment. Additionally or alternatively, it may be beneficial to create one or more discontinuities or inactive regions to prevent overheating or charring of the food item and/or the construct including the susceptor.

[0045] As still another example, a susceptor may incorporate one or more “fuse” elements that limit the propagation of cracks in the susceptor, and thereby control overheating, in areas of the susceptor where heat transfer to the food is low and the susceptor might tend to become too hot. The size and shape of the fuses may be varied as needed. Examples of susceptors including such fuses are provided, for example, in U.S. Patent No. 5,412,187, U.S. Patent No. 5,530,231, U.S. Patent Application Publication No. US 2008/0035634A1, published February 14, 2008, and PCT Application Publication No. WO 2007/127371, published November 8, 2007, each of which is incorporated by reference herein in its entirety.

[0046] All dimensional information presented herein is intended to be illustrative of certain aspects, features, etc., of various embodiments of the disclosure, and is not intended to limit the scope of the disclosure. The dimensions of the blanks, containers, forming tools, features, or any other dimension, can be more or less than what is shown and described in this disclosure without departing from the scope of this disclosure and can be within the listed ranges of dimensions for each feature or outside the listed ranges of dimensions for each feature without departing from the scope of this disclosure.

[0047] The blanks according to the present invention can be, for example, formed from coated paperboard and similar materials. For example, the interior and/or exterior sides of the blanks can be coated with a clay coating. The clay coating may then be printed over with product, advertising, price coding, and other information or images. The blanks may then be coated with a varnish to protect any information printed on the blanks. The blanks may also be coated with, for example, a moisture barrier layer, on either or both sides of the blanks.

[0048] In accordance with the exemplary embodiments, the blanks may be constructed of paperboard of a caliper such that it is heavier and more rigid than ordinary paper. The blanks can also be constructed of other materials, such as cardboard, hard paper, or any other material having properties suitable for enabling the carton package to function at least generally as described above.

[0049] The foregoing description illustrates and describes various embodiments of the present disclosure. As various changes could be made in the above construction without departing from the scope of the disclosure, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense. Furthermore, the scope of the present disclosure covers various modifications, combinations, and alterations, etc., of the above-described embodiments. Additionally, the disclosure shows and describes only selected embodiments, but various other combinations, modifications, and environments are contemplated and are within the scope of the inventive concept as expressed herein, commensurate with the above teachings, and/or within the skill or knowledge of the relevant art. Furthermore, certain features and characteristics of each embodiment may be selectively interchanged and applied to other illustrated and non-illustrated embodiments without departing from the scope of the disclosure.

WHAT IS CLAIMED IS:

1. A container for holding an article, the container comprising:
 - a wall and a flange extending from the wall, the wall at least partially defining a cavity of the container;
 - at least one pleat extending in at least the flange; and
 - a coating on at least a portion of the flange, the coating at least partially covering the at least one pleat and forming a substantially continuous sealing surface on the flange.
2. The container of claim 1, wherein the at least one pleat comprises at least a first portion of material and a second portion of material, the first portion of material and the second portion of material are at least partially overlapped to form the at least one pleat, and a portion of the coating extends between the first portion of material and the second portion of material.
3. The container of claim 1, wherein the wall comprises an end wall connected to a side wall via a corner, the flange extends outwardly from the side wall, the corner, and the end wall, and the at least one pleat extends in at least the flange at the corner.
4. The container of claim 3, wherein at least a portion of each of the side wall, the end wall, and the corner is free from contact with the coating.
5. The container of claim 3, wherein the at least one pleat comprises a plurality of pleats extending in the flange at the corner, and the coating at least partially covers each pleat of the plurality of pleats.
6. The container of claim 3, further comprising a bottom wall connected to each of the side wall, the end wall, and the corner, wherein the coating is spaced apart from bottom wall.
7. The container of claim 1, wherein:
 - the wall comprises a first side wall, a first end wall, a second side wall disposed opposite to the first side wall, and a second end wall disposed opposite to the first end wall;
 - the first side wall is connected to the first end wall and the second end wall via a respective first corner and second corner, and the second side wall is connected to the first end wall and the second end wall via a respective third corner and fourth corner; and
 - the flange extends outwardly from each of the first side wall, the first corner, the first end wall, the third corner, the second side wall, the fourth corner, the second end wall, and the second corner along a perimeter of the container.

8. The container of claim 7, wherein the coating extends along the perimeter of the container on at least a portion of the flange.
9. The container of claim 7, wherein the at least one pleat comprises a plurality of pleats extending in the flange at each of the first corner, the second corner, the third corner, and the fourth corner, and the coating at least partially covers each pleat of the plurality of pleats.
10. The container of claim 1, wherein the wall extends around a perimeter of the container, the flange extends outwardly from the wall along the perimeter of the container, and the coating extends along the perimeter of the container on the flange.
11. The container of claim 10, wherein at least a portion of the wall is free from contact with the coating.
12. The container of claim 10, further comprising a bottom wall connected to the wall, the coating being spaced apart from the bottom wall.
13. The container of claim 1, wherein the container is a press-formed container.
14. The container of claim 1, wherein a lid is attached to the flange at the sealing surface.
15. The container of claim 14, wherein the lid comprises a lidding film.
16. The container of claim 14, wherein the lid comprises polystyrene and the coating comprises a material selected from the group consisting of amorphous polyester, urethane, epoxy, and acrylics.
17. The container of claim 1, wherein the coating comprises a material selected from the group consisting of amorphous polyester, urethane, epoxy, and acrylics.
18. A blank for forming a container for holding an article, the blank comprising:
 - a wall portion and a flange portion for forming a respective wall and flange of a container formed from the blank;
 - at least one score line for forming at least one pleat extending in at least the flange when the blank is formed into the container, the at least one score line extending in at least the flange portion;

a coating on at least a portion of the flange portion, the coating at least partially covering the at least one score line and forming a substantially continuous sealing surface on the flange in the container formed from the blank.

19. The blank of claim 18, wherein at least a first portion of material and a second portion of material along the at least one score line are for being at least partially overlapped to form the at least one pleat when the container is formed from the blank, and a portion of the coating is for extending between the first portion of material and the second portion of material in the at least one pleat when the container is formed from the blank.

20. The blank of claim 18, wherein the wall portion comprises an end wall portion connected to a side wall portion via a corner portion, the flange portion extends along the side wall portion, the corner portion, and the end wall portion, and the at least one score line extends in at least the flange portion at the corner portion.

21. The blank of claim 20, wherein at least a portion of each of the side wall portion, the end wall portion, and the corner portion is free from contact with the coating.

22. The blank of claim 20, wherein the at least one score line comprises a plurality of score lines extending in the flange portion at the corner portion, and the coating at least partially covers each score line of the plurality of score lines.

23. The blank of claim 20, further comprising a bottom portion extending along each of the side wall portion, the end wall portion, and the corner portion, wherein the coating is spaced apart from bottom portion.

24. The blank of claim 18, wherein:

the wall portion comprises a first side wall portion, a first end wall portion, a second side wall portion disposed opposite to the first side wall portion, and a second end wall portion disposed opposite to the first end wall portion;

the first side wall portion is connected to the first end wall portion and the second end wall portion via a respective first corner portion and second corner portion, and the second side wall portion is connected to the first end wall portion and the second end wall portion via a respective third corner portion and fourth corner portion; and

the flange portion extends along each of the first side wall portion, the first corner portion, the first end wall portion, the third corner portion, the second side wall portion, the fourth corner portion, the second end wall portion, and the second corner portion along a perimeter of the blank.

25. The blank of claim 24, wherein the coating extends along the perimeter of the blank on at least a portion of the flange portion.

26. The blank of claim 24, wherein the at least one score line comprises a plurality of score lines extending in at least the flange portion at each of the first corner portion, the second corner portion, the third corner portion, and the fourth corner portion, and the coating at least partially covers each score line of the plurality of score lines.

27. The blank of claim 18, wherein the wall portion extends around a perimeter of the blank, the flange portion extends outwardly from the wall portion along the perimeter of the blank, and the coating extends along the perimeter of the blank on the flange portion.

28. The blank of claim 27, wherein at least a portion of the wall portion is free from contact with the coating.

29. The blank of claim 27, further comprising a bottom portion connected to the wall portion, the coating being spaced apart from the bottom portion.

30. The blank of claim 18, wherein the sealing surface is for being attached to a lid when the container is formed from the blank.

31. The blank of claim 30, wherein the lid comprises polystyrene and the coating comprises a material selected from the group consisting of amorphous polyester, urethane, epoxy, and acrylics.

32. The blank of claim 18, wherein the coating comprises a material selected from the group consisting of amorphous polyester, urethane, epoxy, and acrylics.

33. A method of forming a container from a blank, the method comprising:

obtaining a blank having a wall portion, a flange portion, and a coating on at least a portion of the flange portion, at least one score line extending at least partially in the flange portion, and the coating at least partially covering the at least one score line;

forming the container from the blank by forming a wall of the container from the wall portion and forming a flange of the container from the flange portion, the flange extending from the wall, wherein the forming the container further comprises forming the at least one score line into at least one pleat in at least the flange, and the coating at least partially covers the at least one pleat to form a substantially continuous sealing surface of the container on the flange.

34. The method of claim 33, wherein at least a first portion of material and a second portion of material extend along the at least one score line, and the forming the at least one score line into the at least one pleat comprises at least partially overlapping the first portion of material and the second portion of material are so that a portion of the coating extends between the first portion of material and the second portion of material in the at least one pleat.

35. The method of claim 33, wherein the forming the wall comprises forming an end wall connected to a side wall via a corner, the forming the flange comprises positioning the flange to extend outwardly from the side wall, the corner, and the end wall, and the at least one pleat extends in at least the flange at the corner.

36. The method of claim 35, wherein the at least one score line comprises a plurality of score lines, the forming the at least one pleat comprises forming a plurality of pleats from the plurality of score lines so that the plurality of pleats extend in at least the flange at the corner, and the coating at least partially covers each pleat of the plurality of pleats.

37. The method of claim 33, further comprising attaching a lid to the flange at the sealing surface.

38. The method of claim 37, wherein the lid comprises polystyrene and the coating comprises a material selected from the group consisting of amorphous polyester, urethane, epoxy, and acrylics.

39. The method of claim 33, wherein the coating comprises a material selected from the group consisting of amorphous polyester, urethane, epoxy, and acrylics.

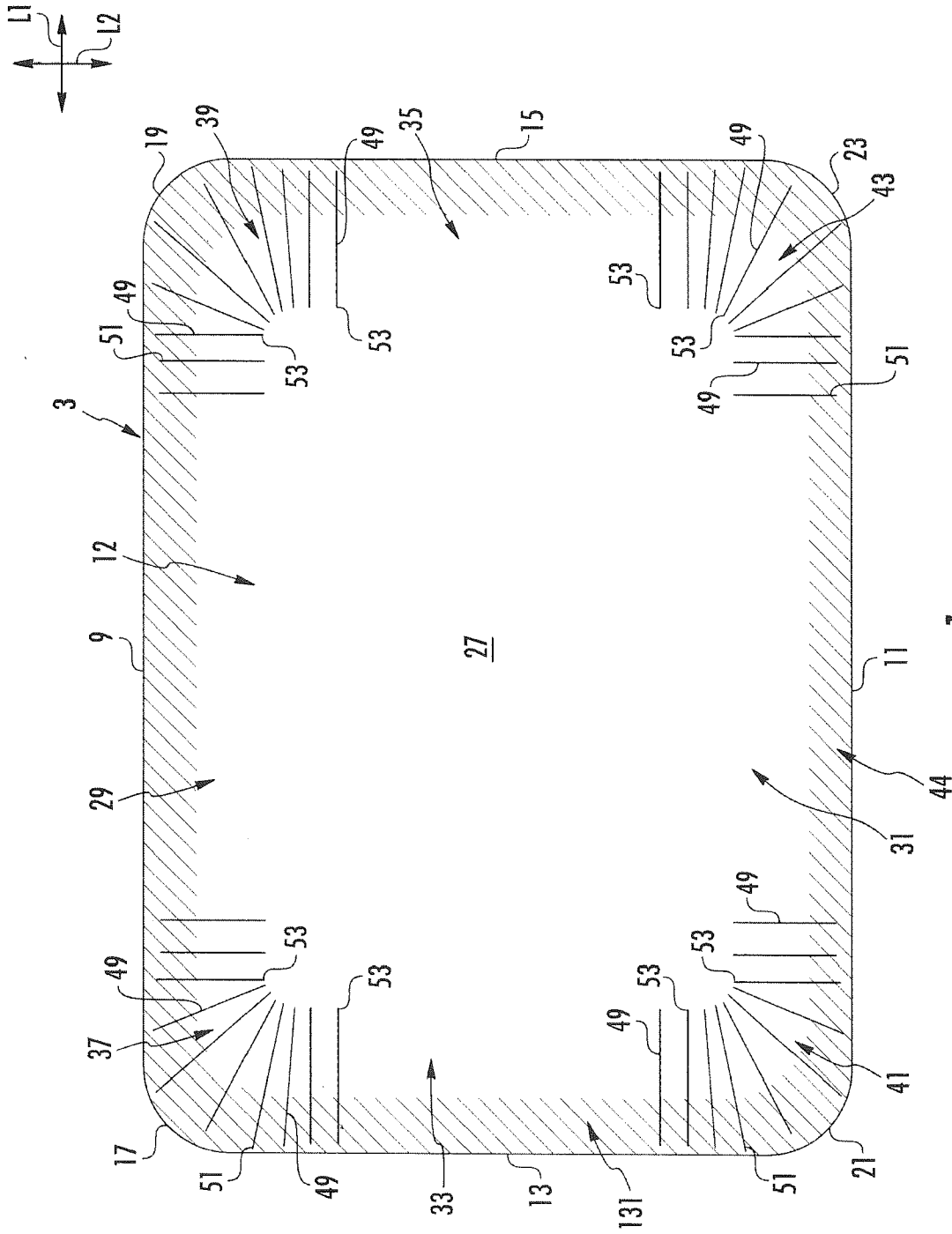


FIG. 1

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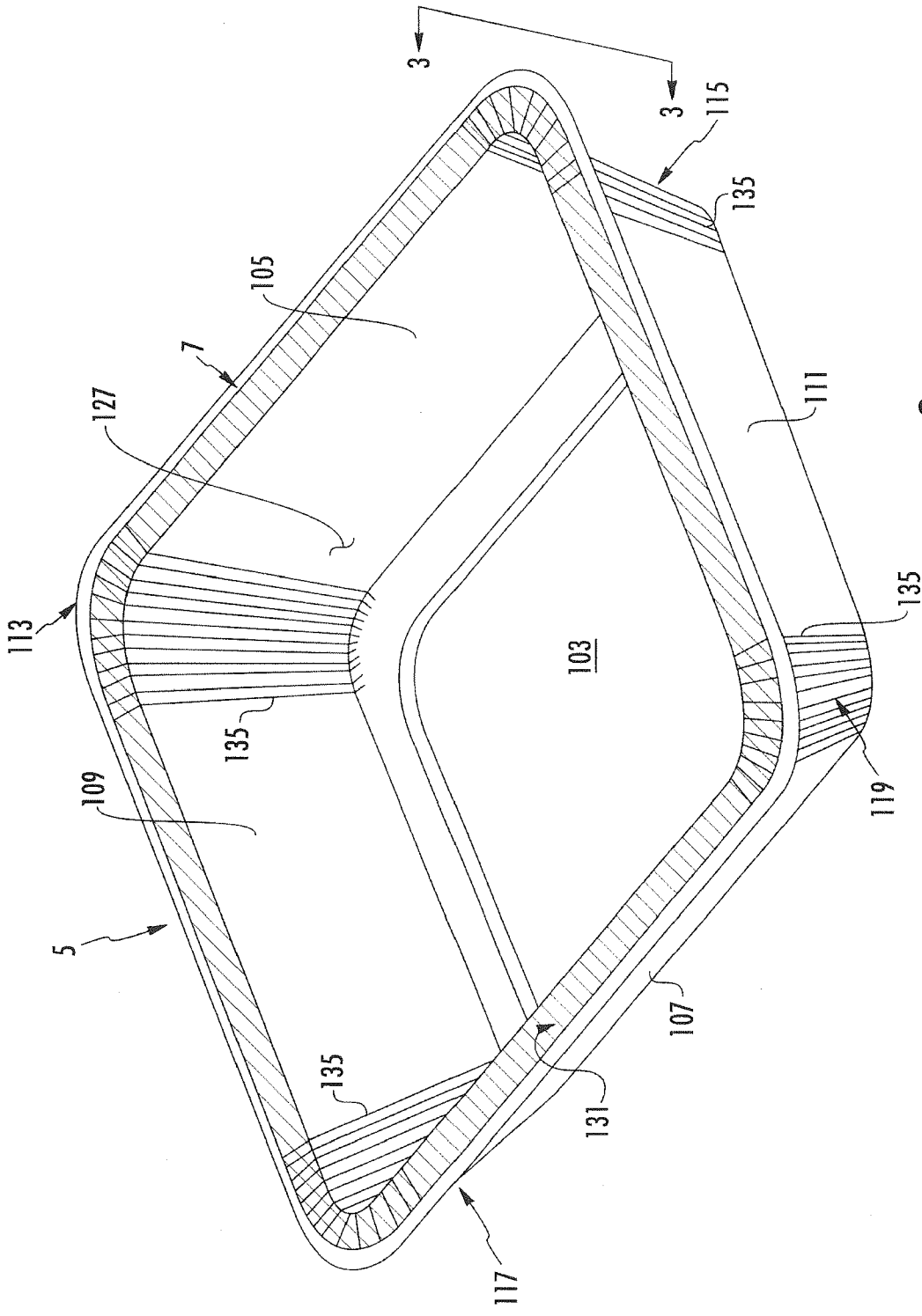


FIG. 2

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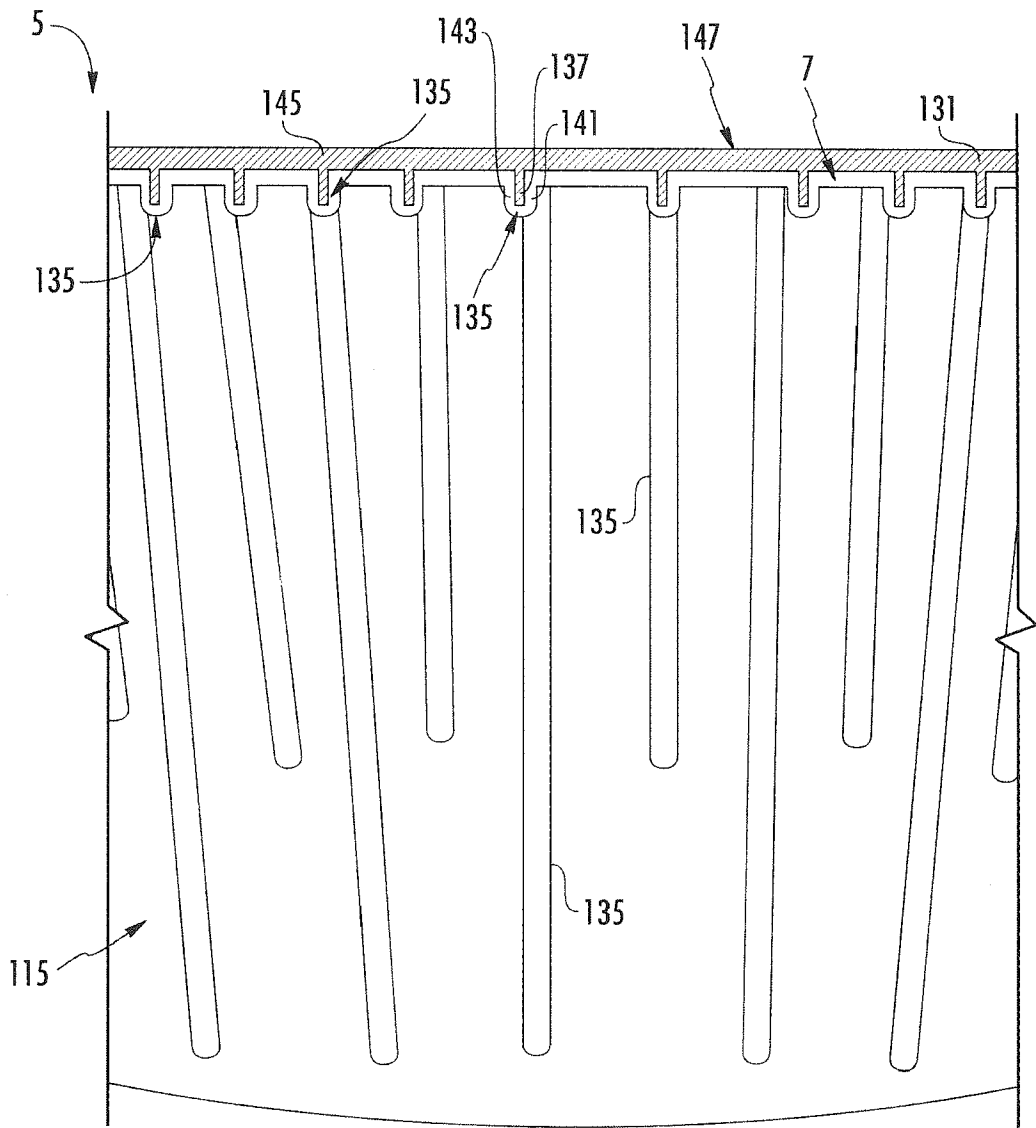


FIG. 3

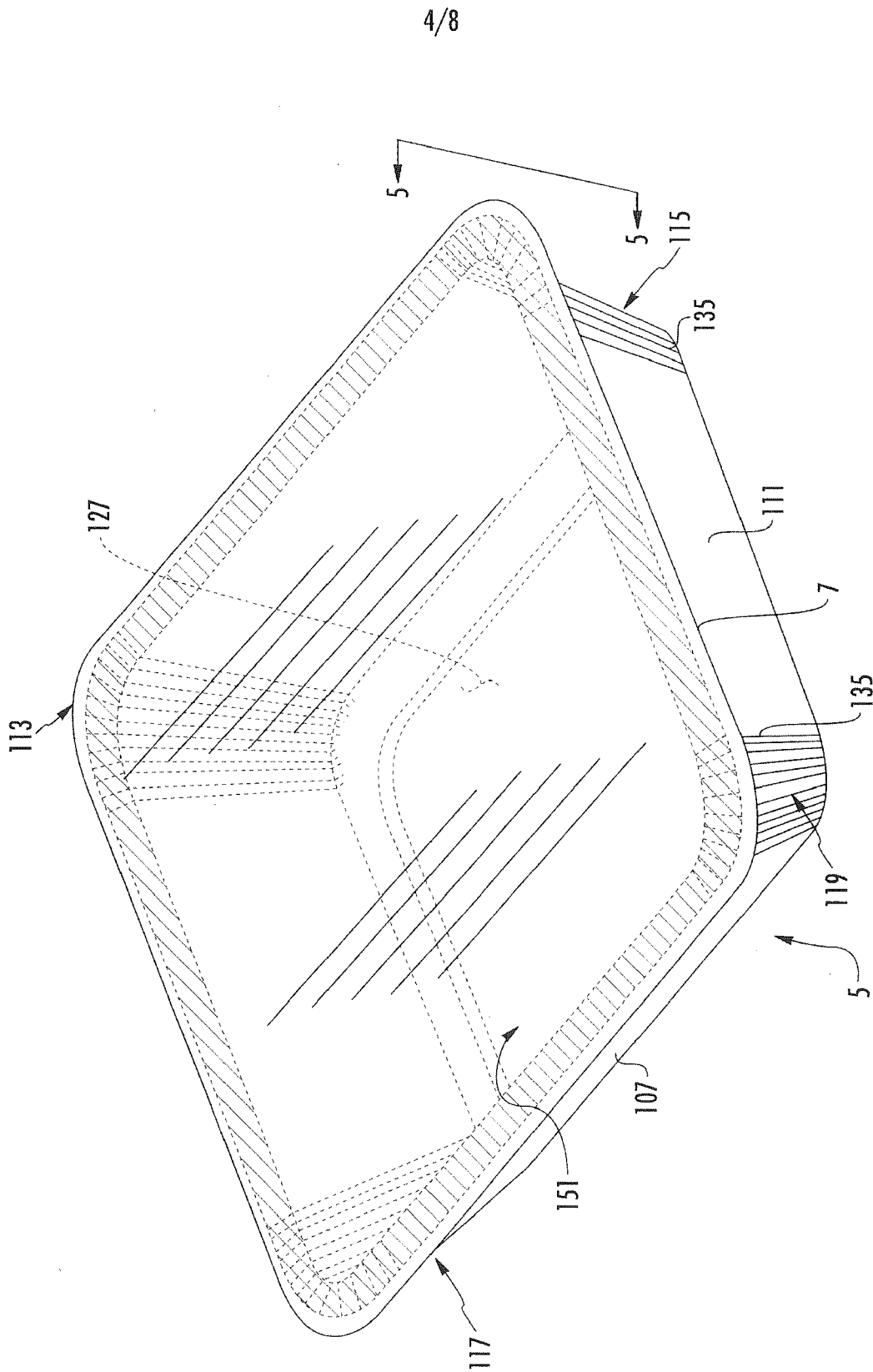


FIG. 4

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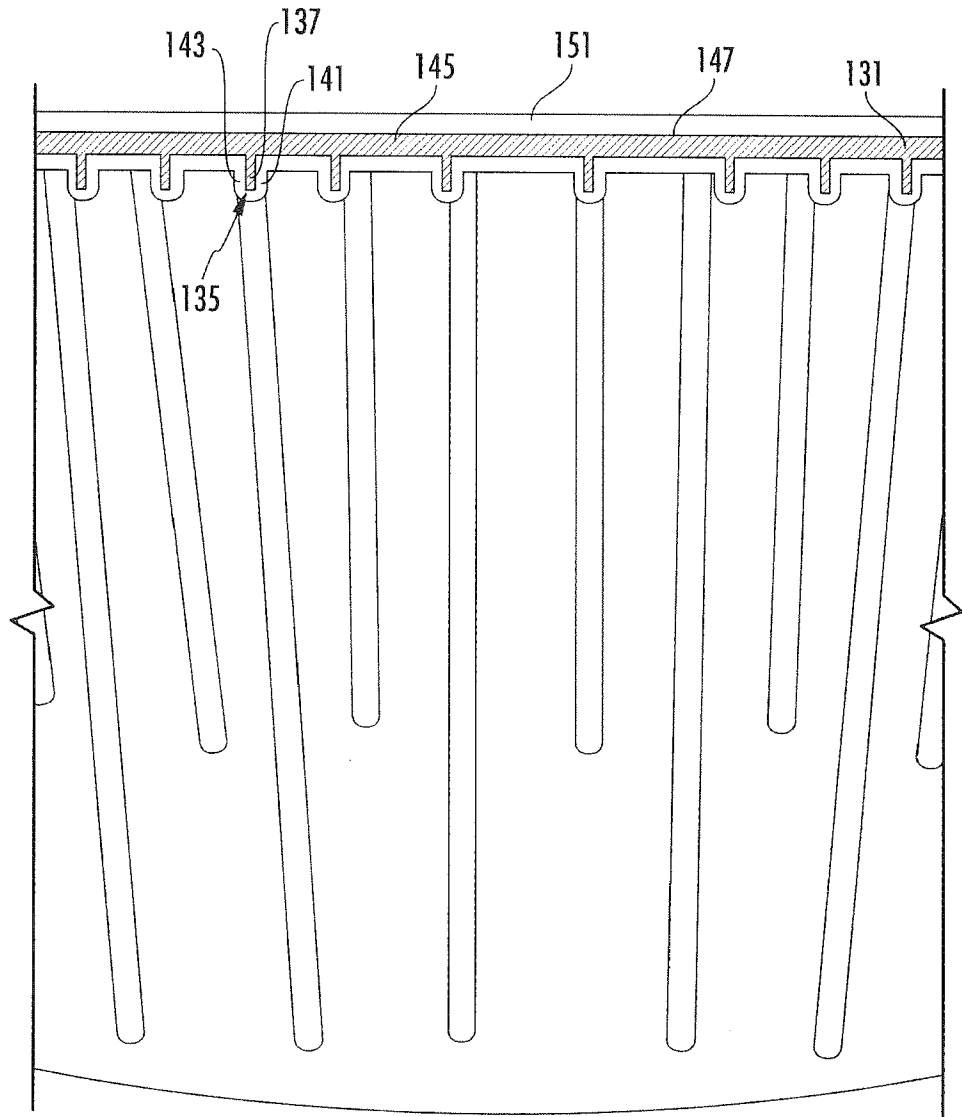


FIG. 5

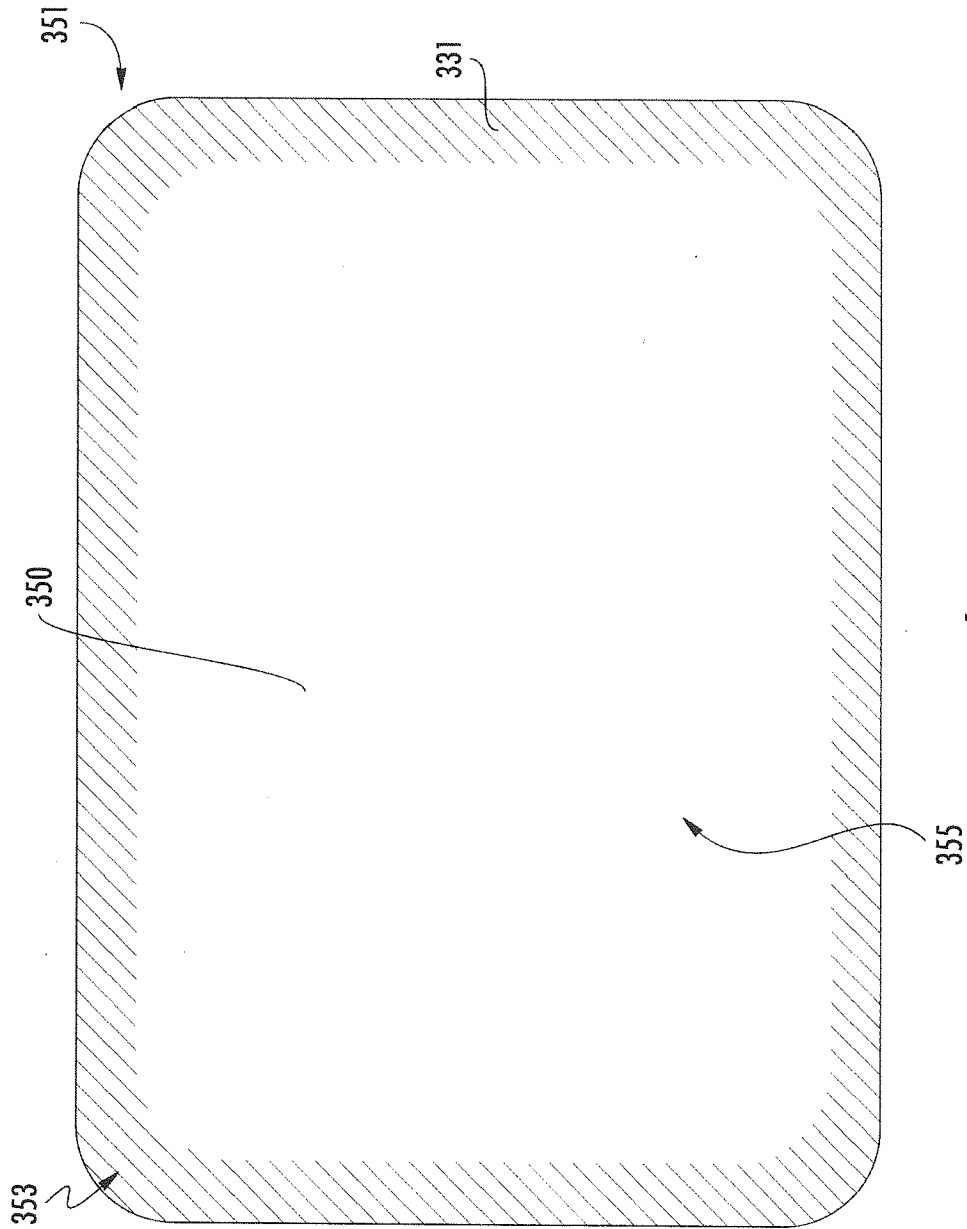


FIG. 6

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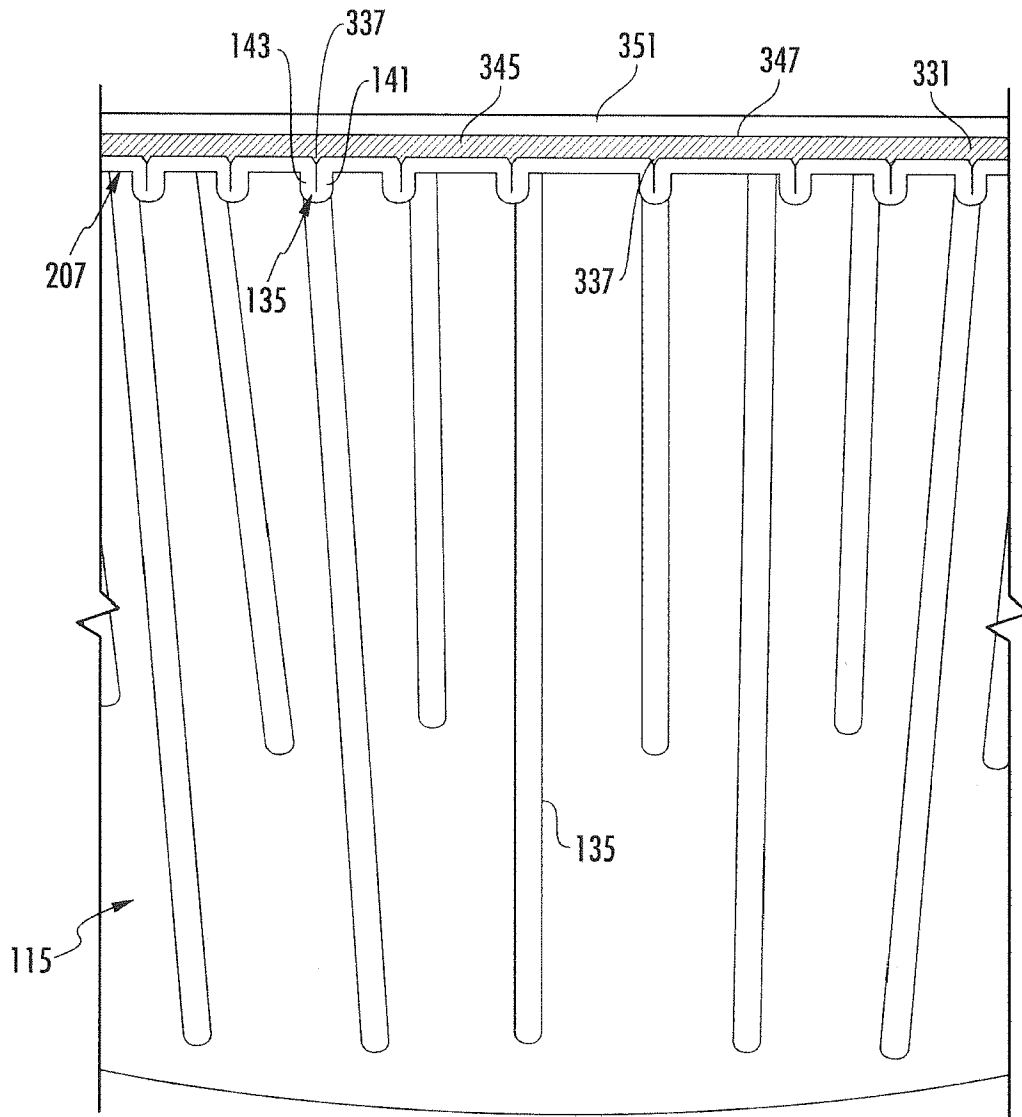


FIG. 7

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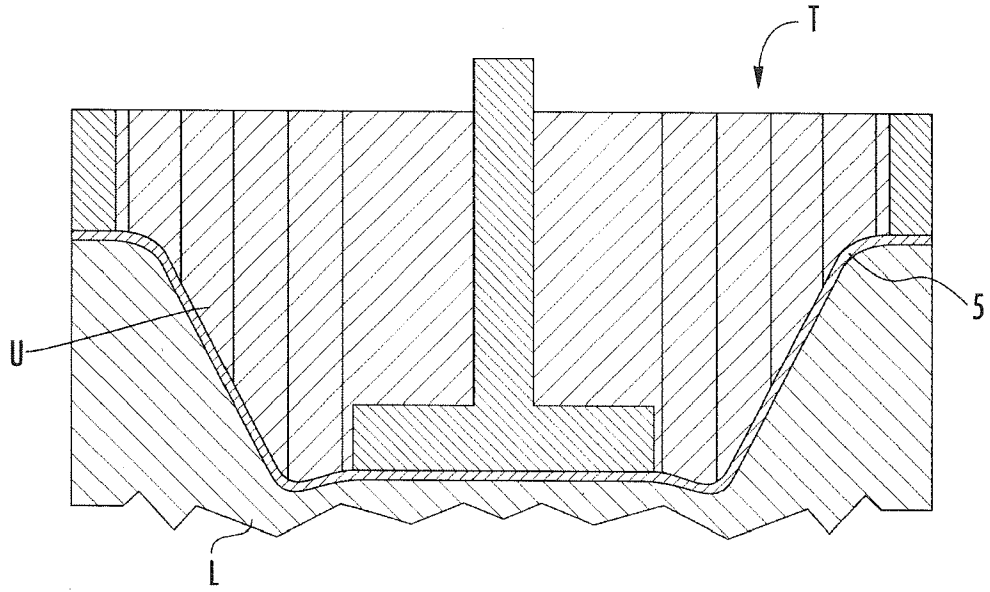


FIG. 8

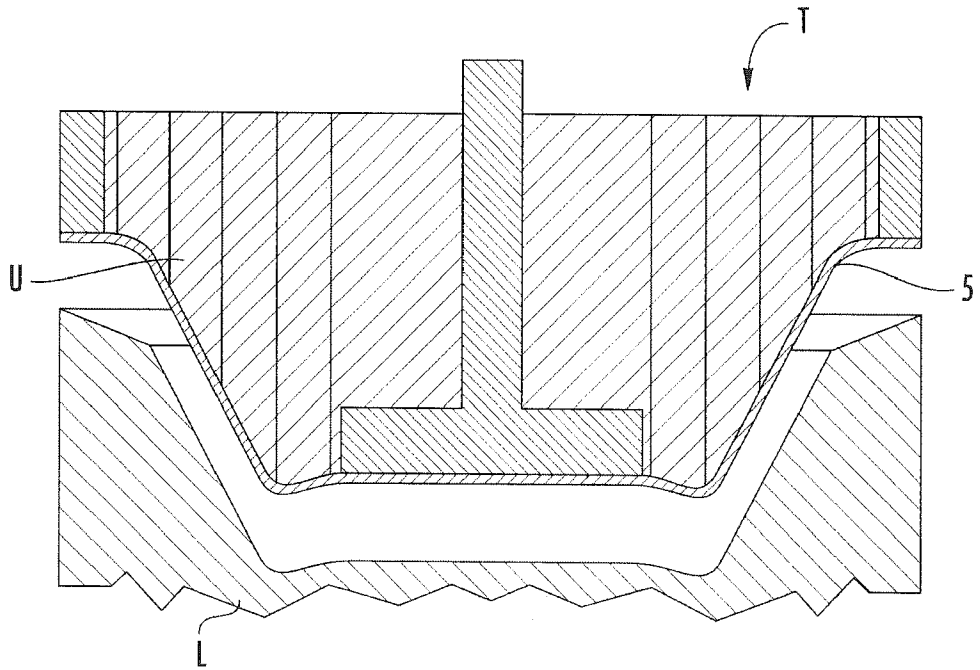


FIG. 9

A. CLASSIFICATION OF SUBJECT MATTER

B65D 25/14(2006.01)i, B65D 1/40(2006.01)i, B65D 1/22(2006.01)i, B65D 1/34(2006.01)i, B65D 77/10(2006.01)i, C08L 25/06(2006.01)i, C09D 167/00(2006.01)i, C09D 175/04(2006.01)i, C09D 163/00(2006.01)i

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B65D 25/14; B65D 6/08; B65D 5/20; B65D 1/40; A47G 19/03; B65D 1/34; B65D 3/22; B65D 1/22; B65D 77/10; C08L 25/06; C09D 167/00; C09D 175/04; C09D 163/00

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

Korean utility models and applications for utility models
Japanese utility models and applications for utility models

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

eKOMPASS(KIPO internal) & keywords: container, wall, pleat, flange, coating, and sealing surface

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6988654 B2 (WNEK, PATRICK H.) 24 January 2006 See column 4, line 45 - column 7, line 61, claims 1, 5, 13, and figures 1-20.	1-13, 17-29, 32-36 ,39
Y		14-16, 30-31, 37-38
Y	US 2004-0262322 A1 (MIDDLETON et al.) 30 December 2004 See paragraphs [0141]-[0147], claims 1, 14-15, and figures 1A, 3-4, 5A.	14-16, 30-31, 37-38
A	US 4026458 A (MORRIS et al.) 31 May 1977 See claims 1, 8 and figures 1-4.	1-39
A	US 2014-0103038 A1 (GRAPHIC PACKAGING INTERNATIONAL, INC.) 17 April 2014 See claims 1-35 and figures 1-9.	1-39
A	US 2009-0173776 A1 (SWOBODA et al.) 09 July 2009 See claims 10, 23-26, 33-34 and figures 1-13.	1-39

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents:

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

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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

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

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

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

"&" document member of the same patent family

Date of the actual completion of the international search

30 May 2016 (30.05.2016)

Date of mailing of the international search report

30 May 2016 (30.05.2016)

Name and mailing address of the ISA/KR

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2016/019467

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