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(54) Title: FLEXIBLE FILM CONTAINER AND METHOD FOR MAKING SAME

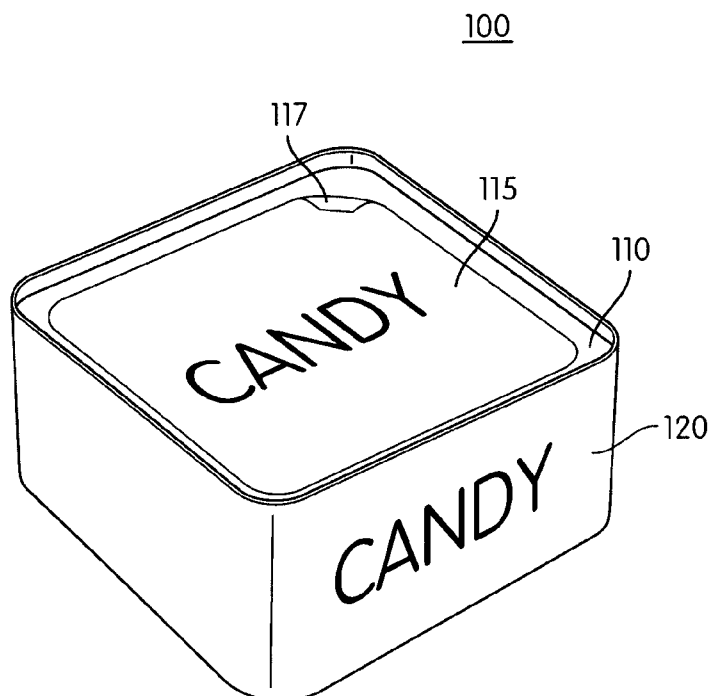


FIG. 1

(57) Abstract: A flexible film container (100) is disclosed. The container includes a top (110), a base (130) and a body (120), the top and base joined to the container body. The container body has at least three discrete sidewalls (121) and is formed of a continuous web of a flexible film. The flexible film container is self-supporting.



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FLEXIBLE FILM CONTAINER AND METHOD FOR MAKING SAME

FIELD

[0001] This application is directed to containers and more particularly to containers constructed of flexible film and processes for their manufacture.

BACKGROUND

[0002] Candy and other small or bite-size products like nuts and mints are typically sold in multi-piece packages. In many cases, the package is designed for bulk sale of the product to the consumer rather than as a single serving size, although in some cases the individual product may still be separately wrapped prior to being placed in the package.

[0003] Historically, the packaging of multi-piece units, particularly for candy, was primarily accomplished through the use of paper bags or metal tins. More recently, plastic bags, and more particularly the plastic bag often referred to as a pillow pack or a lay-down bag has become the industry standard. While pillow packs are advantageous because they are relatively easy and inexpensive to manufacture, they have numerous drawbacks for both the retailer and the consumer.

[0004] Among the drawbacks faced by the retailer with pillow packs is that they are difficult to stack in a way that does not easily fall over in a retail setting where consumers are reaching in and out of shelves. As a result, it can be difficult for the retailer to present the product in a way that does not look disheveled and/or which does not require frequent attention by the retailer's staff.

[0005] Furthermore, the portion of the pillow pack most easily seen by the consumer is its narrow sides; the major surfaces of the package that provide the greatest area for graphics face toward the top of the shelf. The reduced space for advertisements and branding can mean a lost opportunity to achieve a sale through brand recognition or a promotion advertised on the package. Likewise, the consumer must look more carefully to find his or her brand of choice on the store shelf, and may give up if the product cannot be found quickly.

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[0006] Among drawbacks faced by consumers with current pillow packs is that the consumer faces many of the same problems regarding stackability and storage of the product on the pantry shelf that the retailer encounters with the store shelf. Other disadvantages faced by the consumer with the pillow packs currently used for candy packaging include difficulty in opening the package and additional storage problems after the package is opened.

[0007] These and other drawbacks are found in current product packaging.

SUMMARY

[0008] Exemplary embodiments are directed to flexible film containers and processes for manufacturing such containers. The flexible film containers are self-supporting despite being formed of flexible film. That is, they do not require a rigid support placed within the container or in forming the side walls of the container to maintain its shape.

[0009] In one embodiment, a flexible film container comprises a container top, a container base, and a container body that connects the container top to the container base. The container body has at least three discrete sidewalls and is formed of a continuous web of a flexible film. In some embodiments, the container body includes one or more pleats formed in the side walls of the container to provide stanchions that help support the container. In one exemplary embodiment, the container is a three piece construction having a top film lid. In another exemplary embodiment, the container is a two-piece construction with a formed-sealed bottom and top film lid.

[0010] According to another embodiment, a process for manufacturing a flexible film container comprises providing a web of flexible film, sealing a first end of the flexible film to an opposing end of the flexible film to create a continuous container body, forming at least three discrete side walls in the continuous container body, attaching a container top to the container body, attaching a container base to container body, and filling the container body with container contents.

[0011] An advantage is that the flexible film container has a semi-rigid structure that is self-supporting and does not rely on or require the use of a tray, carton, or other support

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positioned within the container, nor does it need to be used in combination with cardboard or other rigid supporting structure to form the sides of the container.

[0012] Another advantage is that the compact size and shape provides for improved shelf efficiency, both in retail and in pantry storage.

[0013] Yet another advantage is that the upright configuration of the container improves shelf appeal and the ability of consumers to easily find the product by increasing the space for graphics.

[0014] Still another advantage of certain embodiments which use a resealable lid is that the container may better prevent spilling, maintain product freshness, and provide for an easily portable package that can also serve as a casual serving dish.

[0015] Other features and advantages of the present invention will be apparent from the following more detailed description of exemplary embodiments, taken in conjunction with the accompanying drawings which illustrate, by way of example, the principles of the invention.

BRIEF DESCRIPTION OF THE DRAWING

[0016] Figure 1 is a perspective view of a flexible film container in accordance with an exemplary embodiment.

[0017] Figure 2a is a schematic cross-sectional view of the flexible film container of Figure 1. Figures 2a-1 through 2a-3 are alternative schematic cross-sectional views in accordance with various embodiments.

[0018] Figure 2b is an exploded view of the flexible film container of Figure 1.

[0019] Figure 3 is a schematic pictorial and textual illustration of a process for manufacturing the flexible film container of Figure 1.

[0020] Figure 4 is a perspective view of a flexible film container in accordance with an exemplary embodiment.

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[0021] Figure 5a is a schematic cross-sectional view of the flexible film container of Figure 4.

[0022] Figure 5b is an exploded view of the flexible film container of Figure 4, including an enlarged view of a pleat formed in the container body.

[0023] Figure 6 is a schematic pictorial and textual illustration of a process for manufacturing the flexible film container of Figure 4.

[0024] Figure 7a is a schematic illustration of a process for manufacturing a flexible film container in accordance with an exemplary embodiment using a vertical arrangement.

[0025] Figure 7b is a schematic illustration of a process for manufacturing a flexible film container in accordance with another exemplary embodiment using a vertical arrangement.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

[0026] Provided is a flexible film container and method of making such a container. The container has the ability to be self-supporting and does not suffer from the drawbacks frequently experienced with known packaging designs.

[0027] Figure 1 illustrates a perspective view of a flexible film container 100 in accordance with an exemplary embodiment. As better seen in the schematic cross-sectional illustration of Figure 2a and the exploded view of Figure 2b, the flexible film container 100 includes a top 110, a base 130 and a body 120 that is intermediate to, and connects, the top 110 to the base 130. In this embodiment, the top 110 and base 130 are formed as individual, discrete elements that are subsequently joined to the body 120 to form the container 100.

[0028] Still referring to Figures 1, 2a and 2b, the body 120 of the container 100 is multi-sided, so that the container 100 has at least three discrete sidewalls 121. In a typical embodiment, the body 120 has four discrete sidewalls 121, such that the container 100 is a rectangular solid. The body 120 is constructed from a continuous web of film material connected at opposing ends using, for example, a heat seal or weld lap joint.

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[0029] The flexible film used for the container body 120 is any suitable thin film for use in packaging. In accordance with exemplary embodiments, very thin films may be used to form the container body 120 and/or other elements of the container 100, while still providing a container that is semi-rigid and self-supporting. The film may have a thickness in the range of between about 25 microns and about 250 microns, more typically between about 75 microns and about 150 microns.

[0030] The film may be a single layer of film material. In some embodiments, the film may instead be a composite or laminate film of multiple layers. One or more such layers may be provided as a barrier layer to preserve freshness of the container contents. Suitable materials for use in the film, either as a single layer or as a component of a multi-layer film include, for example, ethylene vinyl alcohol copolymer, polyamide, polyacrylonitrile, polyethylene terephthalate, polyalkene (polyolefin), polylactic acid (PLA), cellophane, and bioplastic-based film. It will be appreciated that in some cases, selection of particular film materials and/or the order in which those materials are arranged in a laminate film may depend on the particular contents to be stored in the container 100. For example, it may be desirable to achieve a permeability for a container used to store chocolate that is different than if the contents are to be nuts or dried fruit.

[0031] The base 130 provides a bottom to the container 100 (see, for example, Figure 2b). The base 130 is formed as a discrete element from the container body 120 and is typically, but not necessarily, also formed from flexible film. The characteristics of the types of flexible films that may be used to form the base 130 are those as described above with respect to the container body 120, although it will be appreciated that the base 130 may be constructed of a material other than a flexible film, including rigid materials such as cardboard or injection molded thermoplastic.

[0032] The base 130 may include a rim 132 that extends about the periphery of the base 130 and provides a surface coextensive with the lower edge of the body 120. The base rim 132 can thus aid in the manufacture of the container 100 by providing an overlapping surface by which the base 130 can be joined to the body 120 to form a seam. The increased thickness of the subsequently formed seam where the base rim 132 meets the body 120 aids in rendering the container 100 self-supporting.

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[0033] The base 130 may be attached to the body 120 by a heat seal, weld lap joint, or some other method of heat sealing the base rim 132 to the body 120. As best seen in Figure 2a, the base is sized such that the base rim 132 is positioned on the inner surface of the body 120. However, the base 130 could be sized so that the base rim 132 is external to the body 120.

[0034] As also seen in Figure 2a, the base rim 132 is shown extending toward the space defined by the container 100. This provides a flat bottom to the container 100, resulting in better stacking and increased headspace. Alternatively, the base 130 may be constructed such that the base rim 132 extends away from the container 100, i.e., the reverse of the configuration shown in Figure 2a (and illustrated in Figure 2a-1). This alternate configuration reduces the space within the container 100 by the height of the base rim 132, as the major surface of the base 130 extends into the container 100 instead of the base rim 132.

[0035] The container 100 also includes a top 110. Like the base 130, the top is formed as a discrete element from the container body 120 and is typically also formed of flexible film. Also like the base 130, in some embodiments the top 110 may be partially constructed of a rigid material, such as cardboard or injection molded plastic, instead of a flexible film.

[0036] The top 110 includes an aperture for consumers to access the contents of the container 100. The aperture may be formed in the top 110 during manufacture. Alternatively, the aperture to access the container contents may be accomplished by the consumer by virtue of removing a perforated portion 112 formed in the top 110. The use of a perforated portion 112 can be used to provide evidence of tampering or other access to the container contents prior to that of the consumer that purchased the product.

[0037] In some embodiments, the top 110 may include a lid 115, also typically formed of a flexible film. The lid 115 may include a tab 117 and can be attached to the top 110 by an adhesive so that it can be peeled or otherwise removed from the top 110 to expose the aperture formed in the top 110 (or to expose the perforated portion 112 to be removed to form the aperture) of the container 100 for access to the container contents. The lid 115 may be attached and configured to be permanently removed from the container 100.

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Alternatively, the lid 115 may be resealable. The use of a resealable lid can maintain better freshness of the container contents and prevent spills. In embodiments using a resealable lid 115, one or more edges or corners of the lid 115 are permanently attached to the top 110, while one or more other edges or corners of the lid 115 are removably attached to the top 110 by an adhesive or other element that permits repeated opening and re-sealing of the lid 115 to the top 110. It will further be appreciated that in some embodiments, the lid 115 may be formed integral with the top 110 to accomplish the permanent attachment of the lid 115 to the top 110 (See Figure 4).

[0038] As further shown in Figure 2b, the top 110 may include a top rim 114 to provide a surface coextensive with the upper edge of the container body 120 to join the top 110 to the container body 120 by heat sealing or forming a weld lap joint, or other suitable method of joining the two elements 110, 120 of the container 100. As seen in Figure 2a, the top rim 114 is positioned vertically and extends away from the container 100, with the upper edge 124 of the container body 120 folded over the top rim 114, such that the seam thickness is that of the thickness of the film used for the top 110 plus twice the thickness of the film used for the body 120. Additional folds may be introduced into the top rim 114, base rim 132 or container body 120 to increase the thickness of the seams. As shown in the alternative constructions illustrated in Figures 2a-2 and 2a-3, the upper edge 124 of the container body 120 is joined to the top rim 114 by a seam without doubling over the upper edge 124 of the body 120.

[0039] The adjacent surfaces of the container elements 110, 120, 130 that form the upper and lower container seams 117, 137 are shown in the schematic of Figure 2a-2 and 2a-3 with spaces between them for the purpose of exaggerated illustration of the discrete nature of the elements. However, it will be appreciated that sealing those adjacent surfaces results in intimate contact and an integration of the elements at the point of sealing to form the seam. The seam typically extends about the entire perimeter of the packaging to ensure a complete seal. The seams provide additional structure to the container 100 such that the container top 110 and bottom 130 work together when attached to the container body 120 to render the container self-supporting despite being constructed of a flexible film.

[0040] Turning to Figures 4, 5a and 5b, the flexible film container 100 illustrated here includes pleats 125, which are overlapping folds formed in the container body 120. The

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pleats 125 are arranged as stanchions, positioned in a substantially vertical manner and which add strength to the container 100. The pleats 125 thus aid in making the container 100 self-supporting, particularly in embodiments in which the container 100 has a height that approaches or exceeds that of the length or width dimension of the container 100. As shown, the pleats 125 are formed in the sidewalls 121 of the body 120, positioned adjacent and on each side of the corners 126 of the body 120. However, the pleats 125 may be formed directly in the corners 126 or near the middle of the side wall 121, away from the corners 126. In some cases, it may be desirable to introduce some combination of pleats 125 at various locations of the body 120.

[0041] The embodiment illustrated in Figures 4, 5a and 5b is also a rectangular solid, in this embodiment being substantially cubic, having a slight taper from top to bottom, such that the area of the base 130 is less than the area of the top 110. However, the container may also taper from bottom to top. The use of a taper may further enhance the container's self supporting characteristics and its stackability. Depending on the angle of the taper, the flexible film used to form the container body 120 may be adjusted by cutting, folding or other manipulation to account for less material being needed at the end of the container having the smaller area.

[0042] Alternatively, in some embodiments the container has no taper in either direction, having sidewalls 121 that are fully vertically oriented, such that the body 120 is perpendicular to each of the top 110 and base 130. Although the embodiment shown in Figures 4-5b illustrates both pleats and a tapered body, it will be appreciated that these features are not required to be used in combination.

[0043] In addition to the illustrated rectangular solid geometries, the container 100 can have any multi-sided geometry and in one embodiment is a prism. That is, the top 110 and base 130 can be polygons that form two congruent parallel or substantially parallel bases that are joined by the container body 120. The multiple sides of the body 120 can be formed, for example, by creasing the film when making the container body 120 and/or when forming the seams that attach the body 120 to the top 110 and base 130, which further serve to hold the body 120 in the particular geometric configuration desired.

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[0044] Exemplary embodiments thus result in a flexible film container 100 that, despite being formed of a flexible film, is retained in an orientation by the interconnection of the top and bottom members 110, 130 with the body 120 that renders it semi-rigid and self-supporting. The container 100 so constructed is stackable and retains its shape, even when empty. As a result, containers 100 in accordance with exemplary embodiments do not require the use of trays, cartons or other rigid support, either within the container or in the formation of the container body 120. Such containers 100 are stackable and provide a better shelf presence, including more space for graphics and other branding elements. The shape and construction of the container 100 also allows it to conveniently be used as a casual serving dish from which its contents may be consumed directly.

[0045] As shown in Figures 1 and 4, the container 100 may bear graphics or other indicia printed thereon to identify and market the product being sold. In one embodiment, at least a portion of the container 100 is transparent to permit a consumer to view the contents within the container 100. In certain embodiments, the container body 120 and/or the top 110 and/or the base 130 may be constructed entirely of a transparent flexible film, such that the full contents of the container 100 can be viewed except for portions obscured by graphics or labeling information. Alternatively, some or all of the container 100 may be formed of a translucent or opaque film.

[0046] Containers in accordance with exemplary embodiments can be made in any suitable manner to carry out the cutting, folding and seam forming steps described herein. Turning to Figures 3 and 6, exemplary processes for making the containers of Figures 1 and 4, respectively, are schematically illustrated, which may be carried out in an automated and/or continuous manner. A length of film is cut from a reel, which is used to form the container body 120 as step s301/s601. The film is generally first formed into a circular shape by wrapping a first end of the film around to meet the opposing second end, followed by shaping the circular film body into the multi-sided body having the desired number of sidewalls 121. As shown in Figure 6, in embodiments in which the body 120 contains pleats 125, the pleats 125 are formed at step s603. Pleat formation involves various steps of folding and overlapping the film as the film is formed into the body 120 having the desired shape. In either case (with or without pleats), the body 120 is sealed to hold it in its enclosed formation at step s305/s605, which may be accomplished after the

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desired shape of the body 120 is realized, particularly in embodiments in which pleats 125 are formed in the sidewalls 121 of the body 120.

[0047] The top 110 or base 130 is thereafter attached to the container body 120, which may occur by heat sealing the top 110 or base 130 to the container body 120 at step s307/s607 to form the seam as previously described. This creates a container 100 having one unopened side for filling with the container contents at step s309/s609. The contents may be filled by jumble packing from a hopper; alternatively, the contents may be filled by placement of the contents in a predetermined, specific arrangement. In some embodiments, it may be desirable to fill the container to about 95% of its volume for better stacking of full containers.

[0048] In the process illustrated in Figures 3 and 6, the top 110, cut and formed from a separate film reel, is sealed to the container body 120 first (s307/s607), followed by filling the container 100 with its contents through the still-open bottom of the container (s309/s609). The base 130, cut and formed from another separate film reel, is then placed and sealed to create the finished product (s311/s611), which is ready for packing, delivery and sale.

[0049] Prior to attaching the base 130 and sealing the contents within the container 100 (until subsequently opened by the consumer), it may be desirable to introduce a gas into the container 100. In some cases, the gas may be used to pressurize the container 100 to give it further rigidity and protect the contents during shipping and handling. It may be desirable to introduce a gas to the container 100, such as nitrogen, that does not contain oxygen. This reduces or eliminates the amount of oxygen within the container 100 and maintains the freshness of its contents.

[0050] Figures 7a and 7b illustrate alternative continuous processes for manufacturing flexible film containers 100 using a vertical fill in accordance with additional exemplary embodiments. Referring to Figure 7a, the flexible film forming the container body 120 is formed around and pulled along a square mandrel 710, with the film secured to itself by a heat seal or other method of forming a seam. At the mandrel base 715, which also serves as the fill outlet for the container contents, the base 130 (or alternatively the top 110) is applied, followed by filling the container 100 with its contents. The top 110 (or

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alternatively the base 130) is then attached to complete the container construction. In some embodiments, the mandrel may be heated, which can further assist in imparting shape to the container body 120 and may also provide better sealing when the seams are formed to secure ends of the container body 120 and to secure the container body 120 to the top 110 and base 130.

[0051] Figure 7b illustrates a process similar to that shown and described in Figure 7a, but using a two piece construction. Here, the base 130 is illustrated as being formed and sealed using a gusseted arrangement such that the flexible film used to form the base 130 is contiguous with the flexible film used to form the container body 120, which is still formed by pulling the film along the square mandrel 710. After the base 130 is formed, the container 100 is filled and the top 110 is applied.

[0052] While the foregoing specification illustrates and describes exemplary embodiments, it will be understood by those skilled in the art that various changes may be made and equivalents may be substituted for elements thereof without departing from the scope of the invention. In addition, many modifications may be made to adapt a particular situation or material to the teachings of the invention without departing from the essential scope thereof. Therefore, it is intended that the invention not be limited to the particular embodiment disclosed as the best mode contemplated for carrying out this invention, but that the invention will include all embodiments falling within the scope of the appended claims.

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CLAIMS

1. A flexible film container comprising:
 - a container top;
 - a container base;
 - a container body connecting the container top to the container base, the container body having at least three discrete sidewalls and formed of a continuous length of a flexible film, the container top and container base being attached to the container body in a manner to render the flexible film container self-supporting.
2. The flexible film container of claim 1, wherein the container top includes a resealable lid attached thereto.
3. The flexible film container of claim 1, wherein the container body includes a pleat formed in the sidewall.
4. The flexible film container of claim 3, wherein the pleat is formed in the sidewall adjacent a corner of the container body.
5. The flexible film container of claim 1, wherein the container body includes a pleat formed in a corner of the container body.
6. The flexible film container of claim 1, wherein the container body tapers from the container top to the container base or from the container base to the container top.
7. The flexible film container of claim 1 wherein the container body has four discrete sidewalls.
8. The flexible film container of claim 7, wherein the flexible film container is a rectangular solid.
9. The flexible film container of claim 8, wherein the flexible film container is cubic.
10. The flexible film container of claim 1, wherein the flexible film container is a prism.
11. The flexible film container of claim 1, wherein the container base has a rim attached to the container body.
12. The flexible film container of claim 1, wherein the container top has a rim attached to the container body.

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13. The flexible film container of claim 1, wherein the container top, container base and container body are discrete elements each formed of a flexible film.

14. The flexible film container of claim 1, wherein the container top is formed of a flexible film.

15. A flexible film container comprising:

a container top formed of a flexible film material, the container top having a rim and a resealable lid;

a container base formed of a flexible film material, the container base having a rim;

a container body connecting the container top to the container base, an upper portion of the container body sealed to the container top rim and a lower portion of the container body sealed to the container base rim,

wherein the container body has four discrete sidewalls and is formed of a continuous length of a flexible film, wherein the container top and container base are attached to the container body in a manner to render the flexible film container self-supporting.

16. A process of manufacturing a flexible film container comprising:

providing a web of flexible film;

forming at least three discrete side walls in the continuous container body;

sealing a first end of the flexible film to an opposing end of the flexible film to create a continuous container body;

attaching a container top to the container body;

attaching a container base to container body; and

filling the container body with container contents.

17. The process of claim 16, wherein the step of filling the container body is after the step of attaching the container top and before the step of attaching the container base.

18. The process of claim 16, further comprising forming a pleat in the container body prior to the step of sealing the first end of the film to the opposing end.

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19. The process of claim 18, wherein the step of forming a pleat comprises forming a pleat in a sidewall of the container body adjacent a corner of the container body.
20. The process of claim 16, wherein the step of attaching a container top includes sealing a container top rim to the container body.
21. The process of claim 16, wherein the step of attaching a container base includes sealing a container base rim to the container body.

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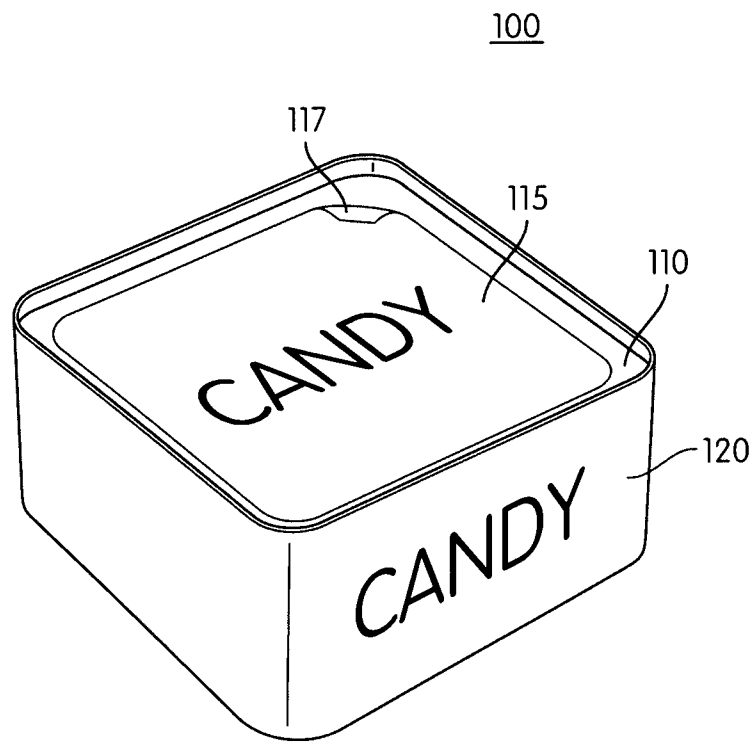
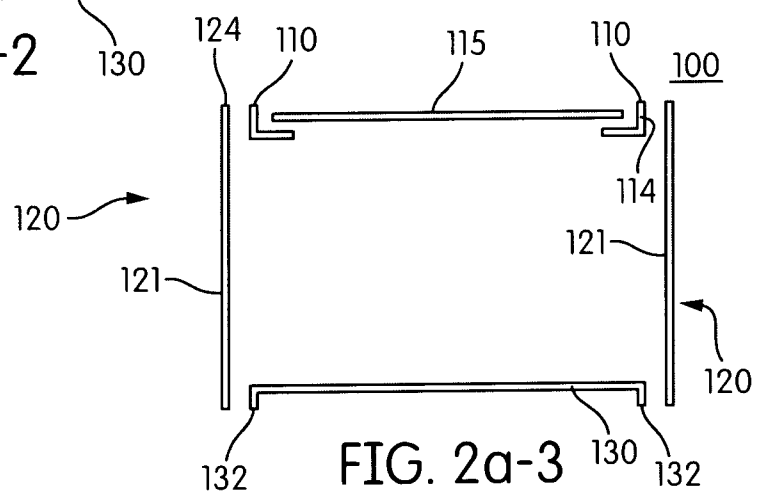
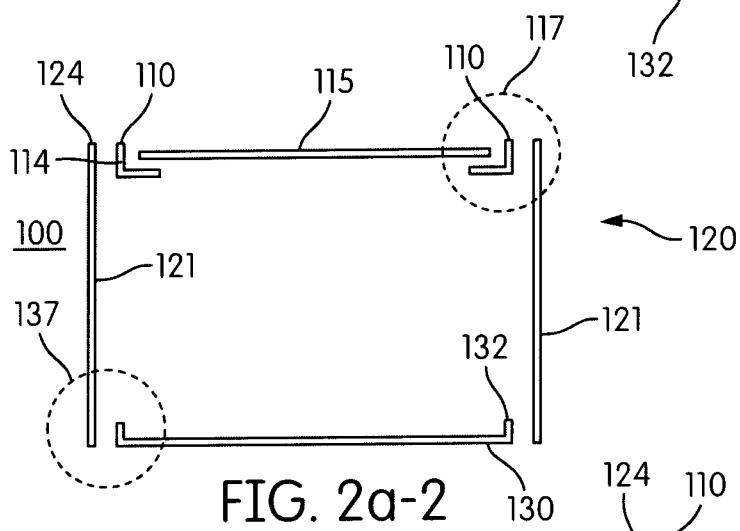
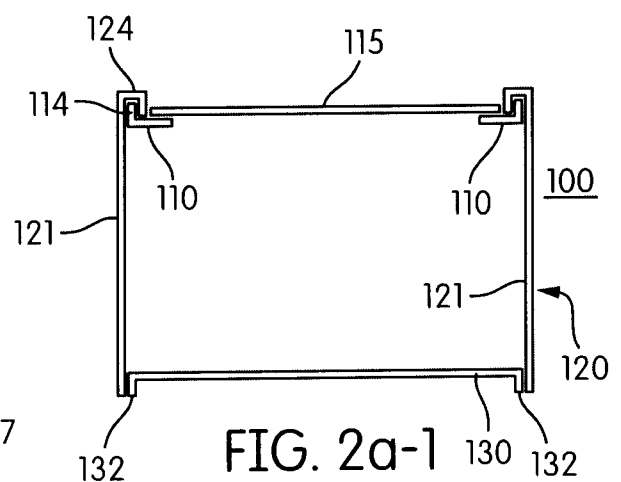
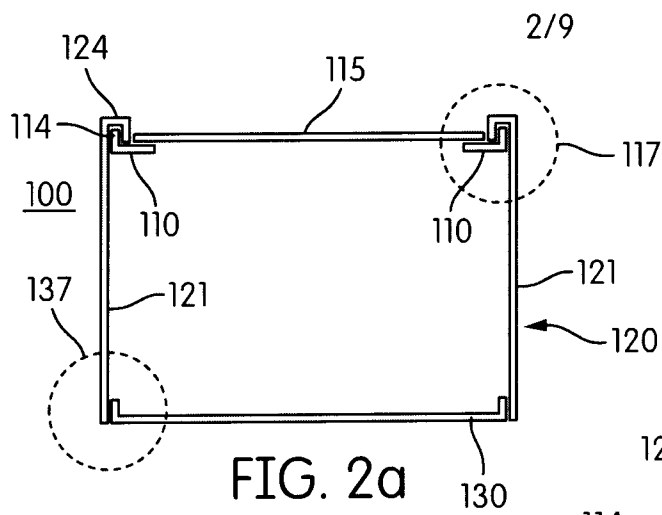


FIG. 1



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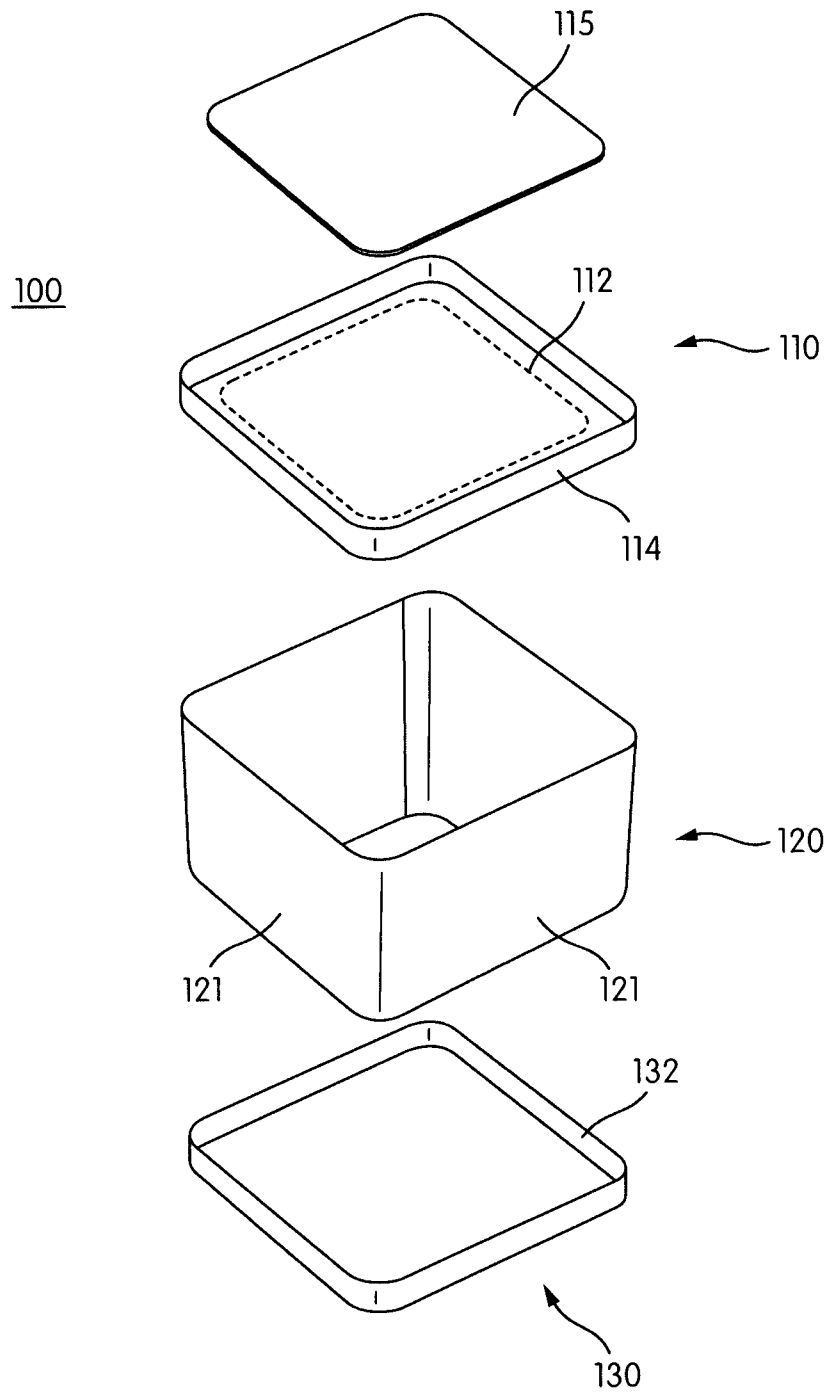


FIG. 2b

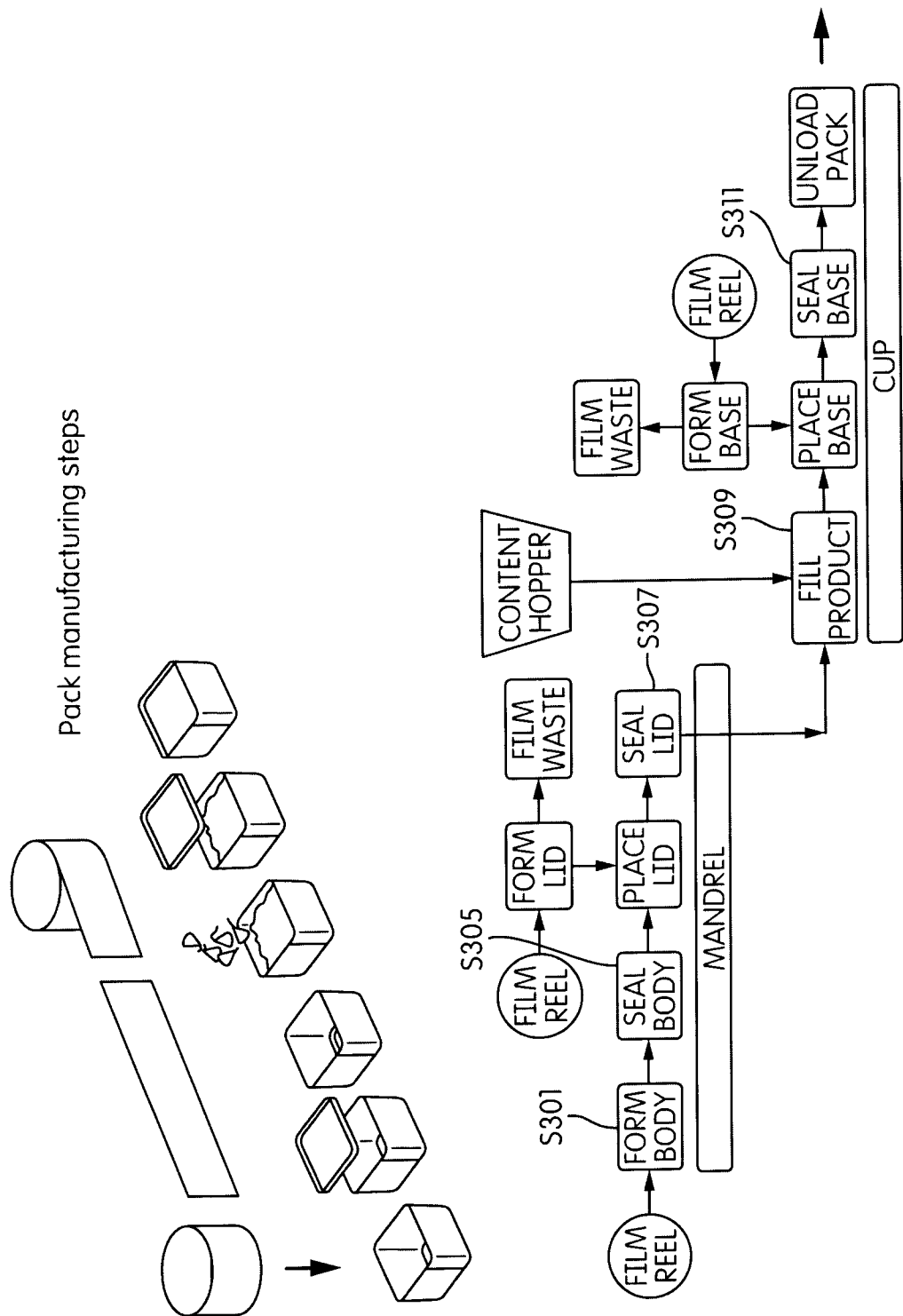


FIG. 3

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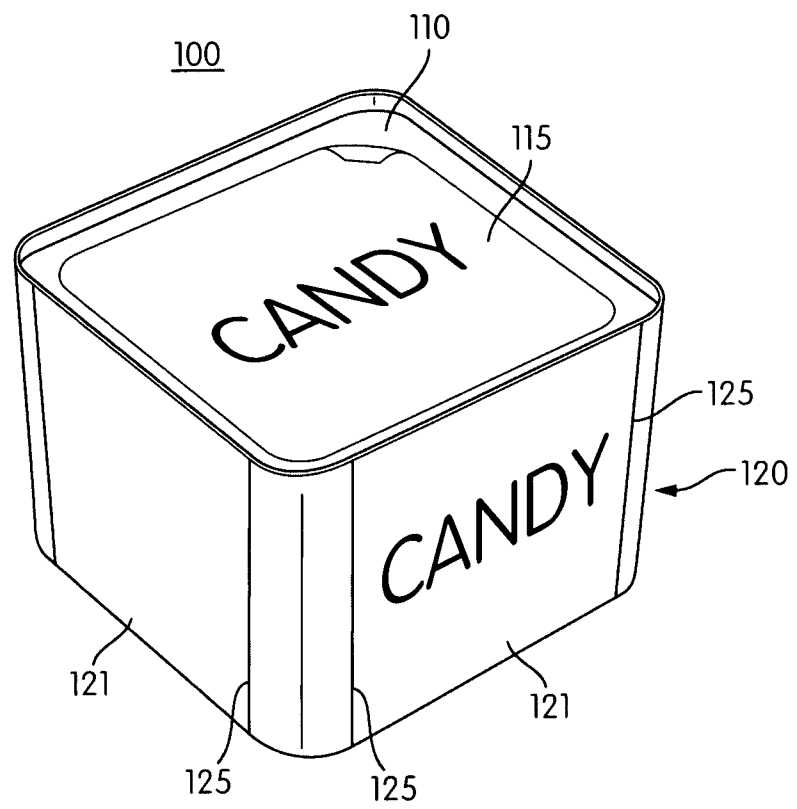
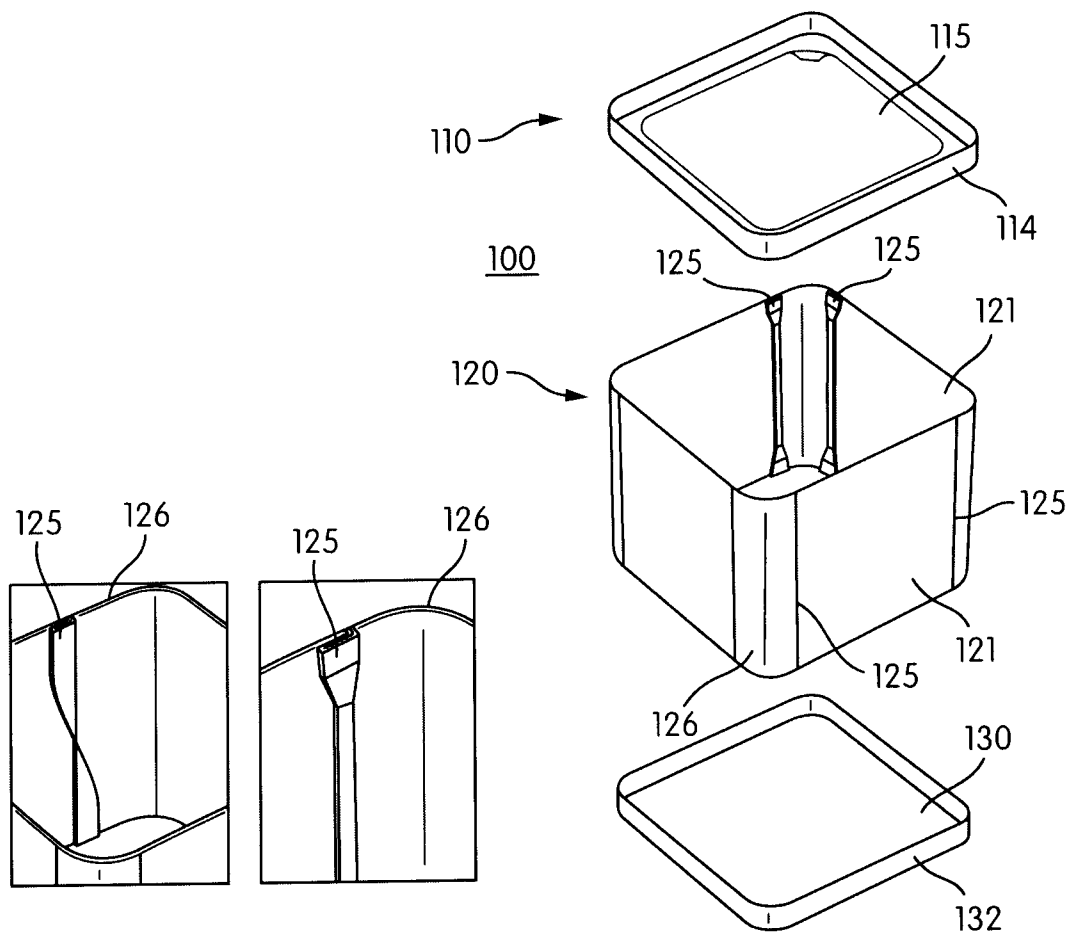
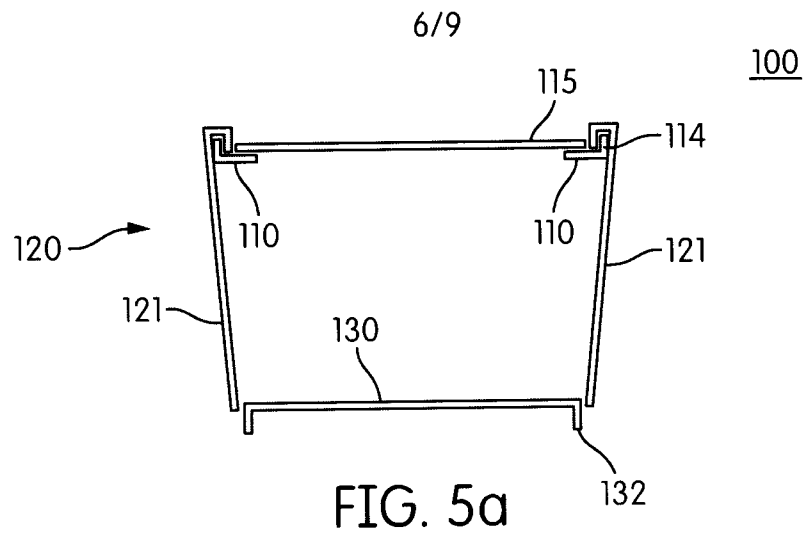
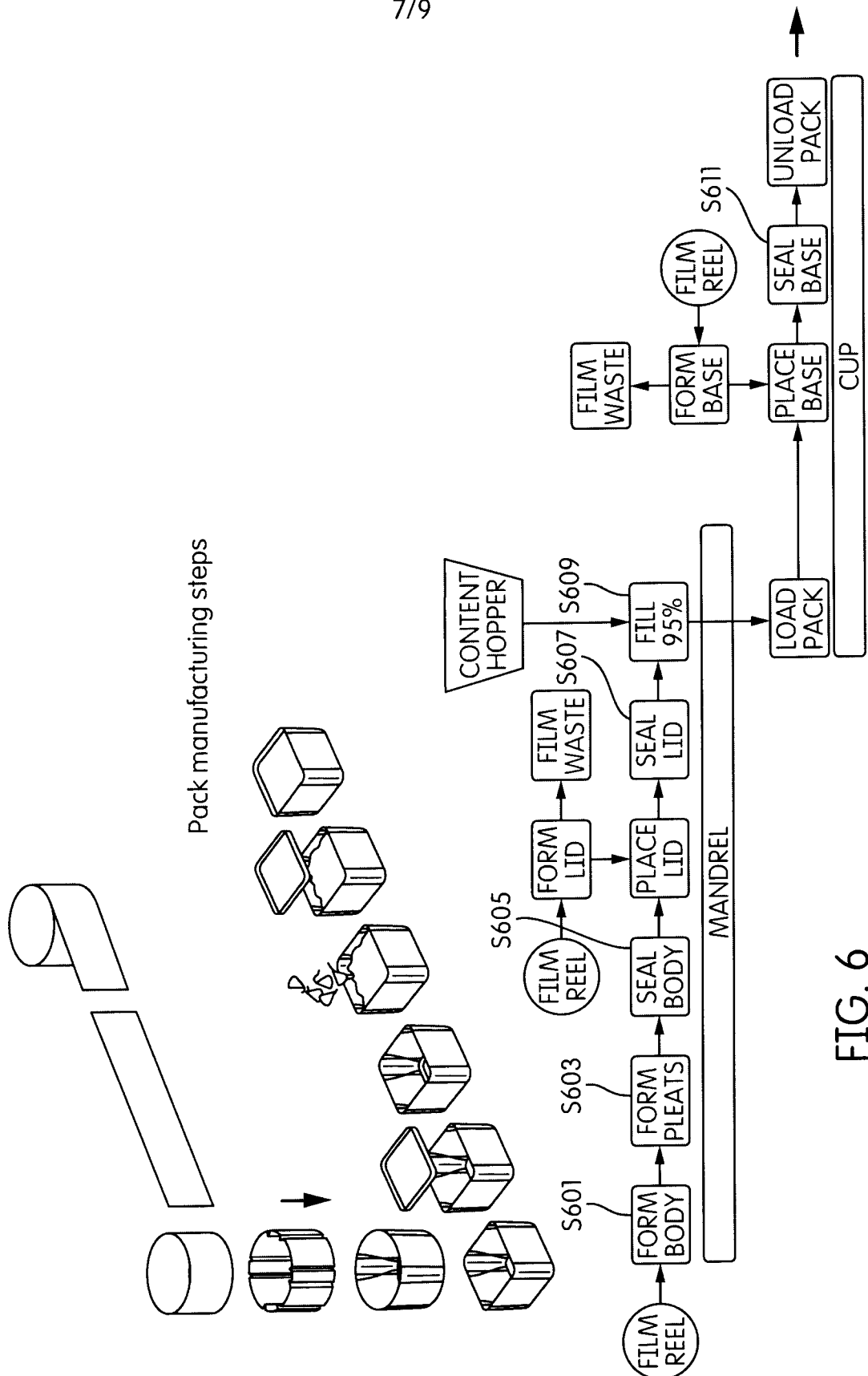


FIG. 4



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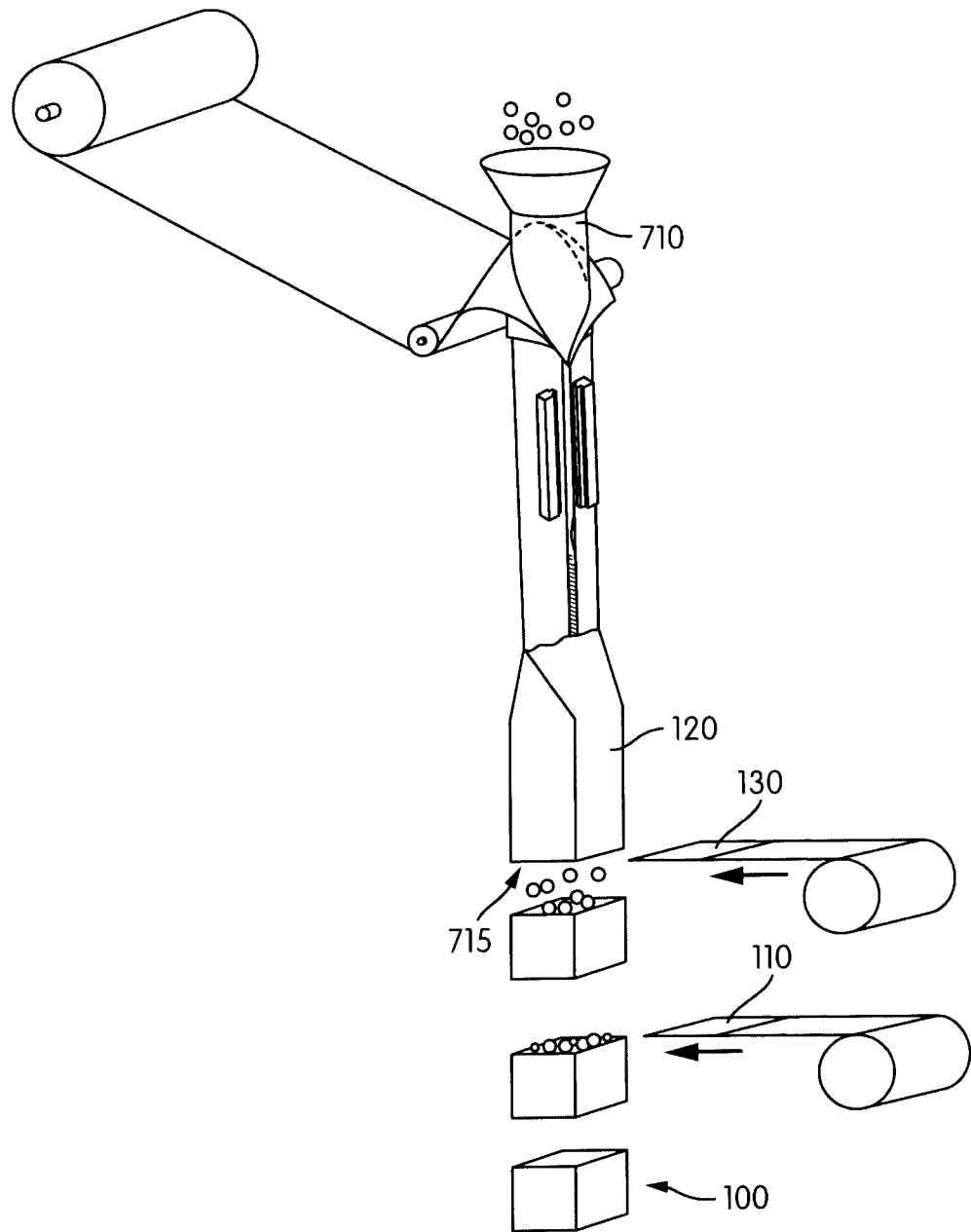


FIG. 7a

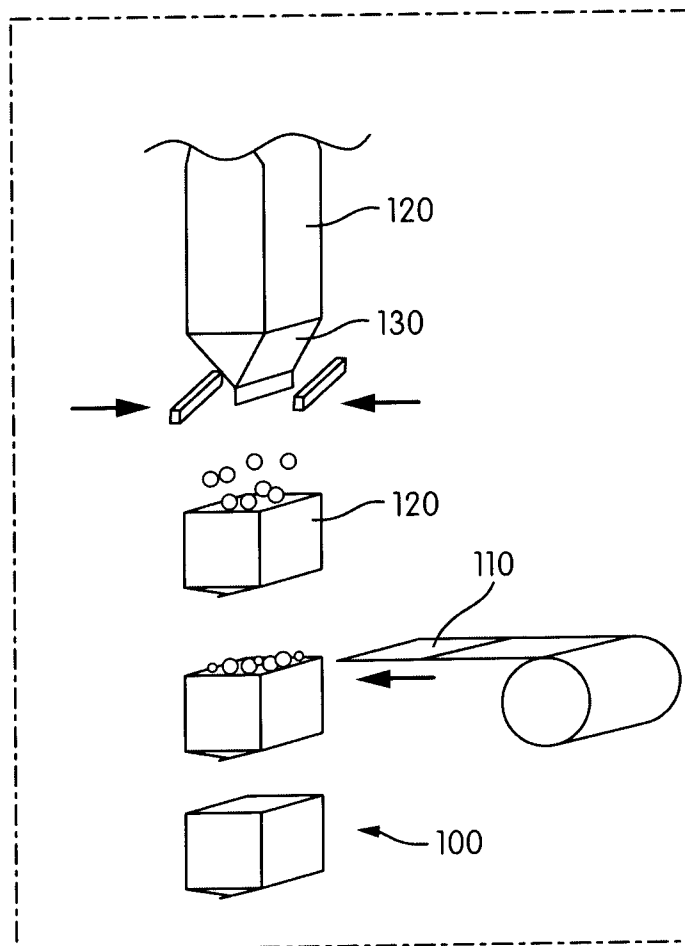


FIG. 7b

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2011/064197

A. CLASSIFICATION OF SUBJECT MATTER

INV. B65D75/00 B65D77/20 B65B5/02 B65B7/00 B65B9/20
ADD. B65D75/58

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 B65B B31B

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)

EP0-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2010/140129 A1 (SANFILIPPO JOHN E [US] ET AL) 10 June 2010 (2010-06-10)	1-4,7,8, 10-12, 16-21
Y	paragraphs [0002], [0049], [0050], [0051], [0103], [0107]; figures 1-36 -----	5,6,15
X	DE 12 81 928 B (MONSANTO CO) 31 October 1968 (1968-10-31)	1,7,8, 10-14, 16,20,21
Y	column 1, line 1 - line 9 column 3, line 1 - column 6, line 10 figures 1-3 ----- -/--	6,15



Further documents are listed in the continuation of Box C.



See patent family annex.

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Date of the actual completion of the international search

17 February 2012

Date of mailing of the international search report

29/02/2012

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Authorized officer

Fitterer, Johann

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2011/064197

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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Y	page 1, paragraph 1 page 4, paragraph 1 - paragraph 3 page 7, paragraph 4 - page 8, paragraph 1 figures 1-6	5,15
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