



US 20120187182A1

(19) **United States**(12) **Patent Application Publication**  
**Howell et al.**(10) **Pub. No.: US 2012/0187182 A1**(43) **Pub. Date: Jul. 26, 2012**(54) **CARTON WITH PLASTIC RECLOSABLE  
HEADER**(75) Inventors: **Clifton Howell**, Buford, GA (US);  
**David Wallace**, Lilburn, GA (US);  
**Kenny McCracken**, Dacula, GA  
(US); **Kevin Owen**, Flowery  
Branch, GA (US); **Rusty**  
**Koenigkramer**, Nanuet, NY (US);  
**Steven Olechowski**, Aroma Park,  
IL (US)(73) Assignee: **ILLINOIS TOOL WORKS INC.**,  
Glenview, IL (US)(21) Appl. No.: **12/922,537**(22) PCT Filed: **Sep. 13, 2010**(86) PCT No.: **PCT/US10/48615**§ 371 (c)(1),  
(2), (4) Date: **Jun. 1, 2011****Related U.S. Application Data**(60) Provisional application No. 61/249,852, filed on Oct.  
8, 2009, provisional application No. 61/298,429, filed  
on Jan. 26, 2010.**Publication Classification**(51) **Int. Cl.**  
**B65D 5/18** (2006.01)  
**B65D 5/43** (2006.01)  
**B65D 5/64** (2006.01)  
(52) **U.S. Cl.** ..... **229/102; 229/183; 229/125.14**(57) **ABSTRACT**

The disclosure relates to a method and apparatus for manufacturing a package with a rigid or semi-rigid container and a polymeric or plastic header with a reclosure, such as a zipper. The rigid or semi-rigid container is typically provided in a stack of flat containers. The header is sealed, glued or otherwise secured to the containers. The container, typically inverted, is filled, and the bottom is formed by folding and sealing the bottom portion of the container.

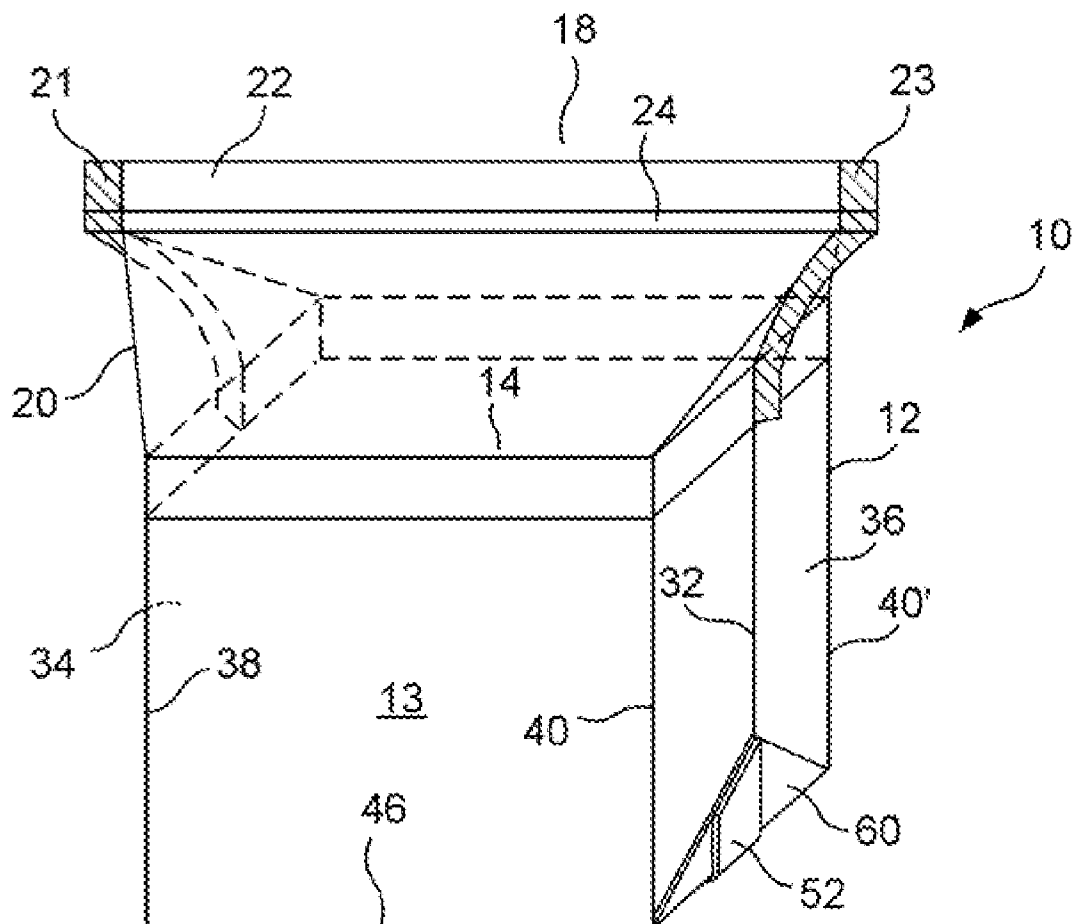


FIG. 2

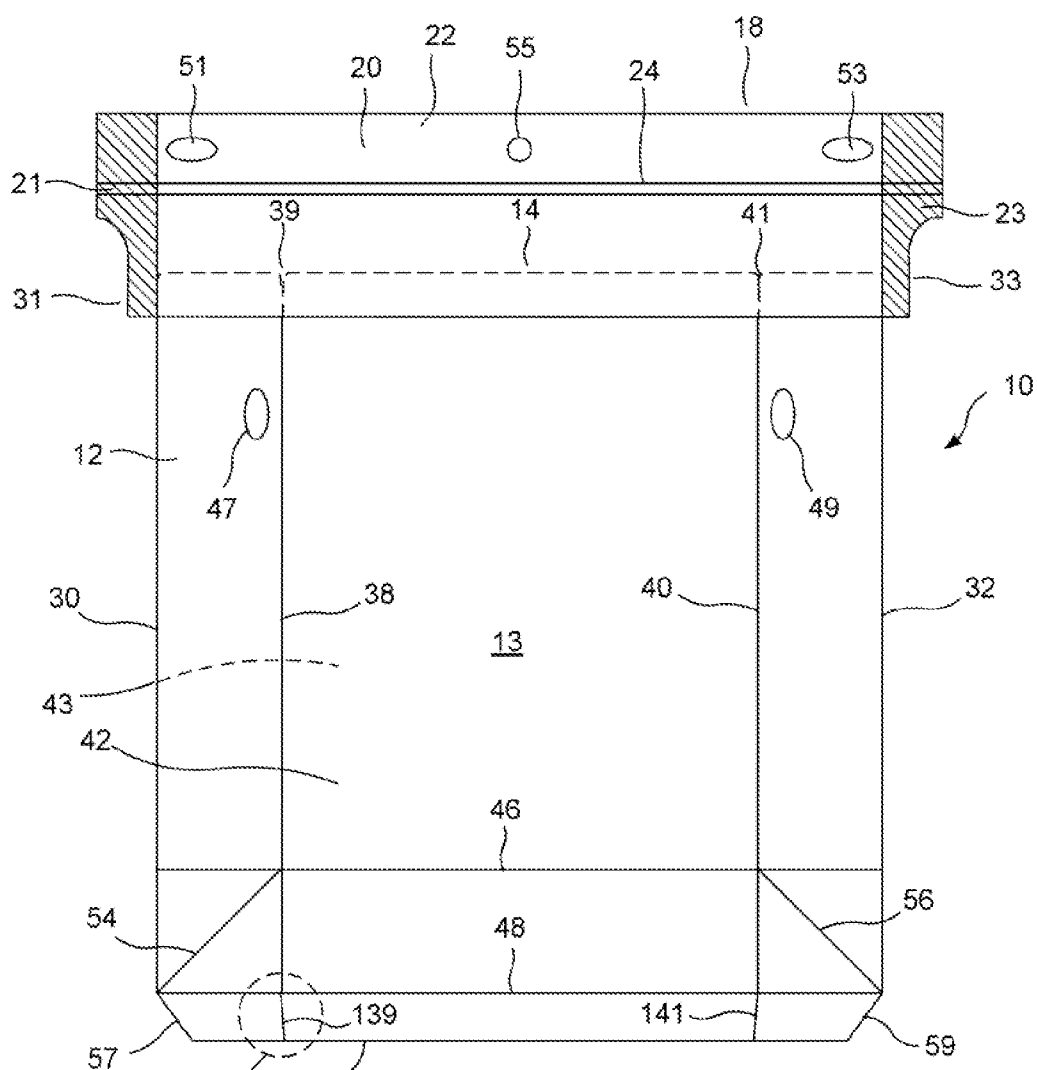


FIG. 3A

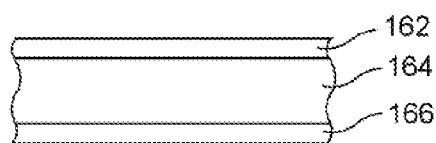
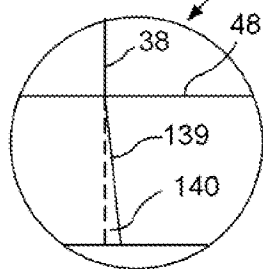


FIG. 3B

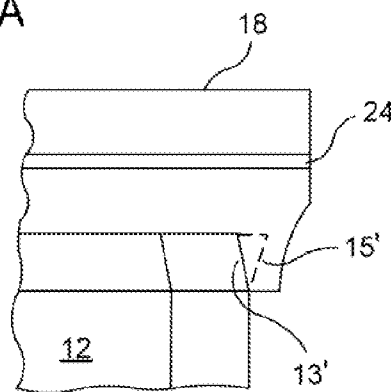


FIG. 3C

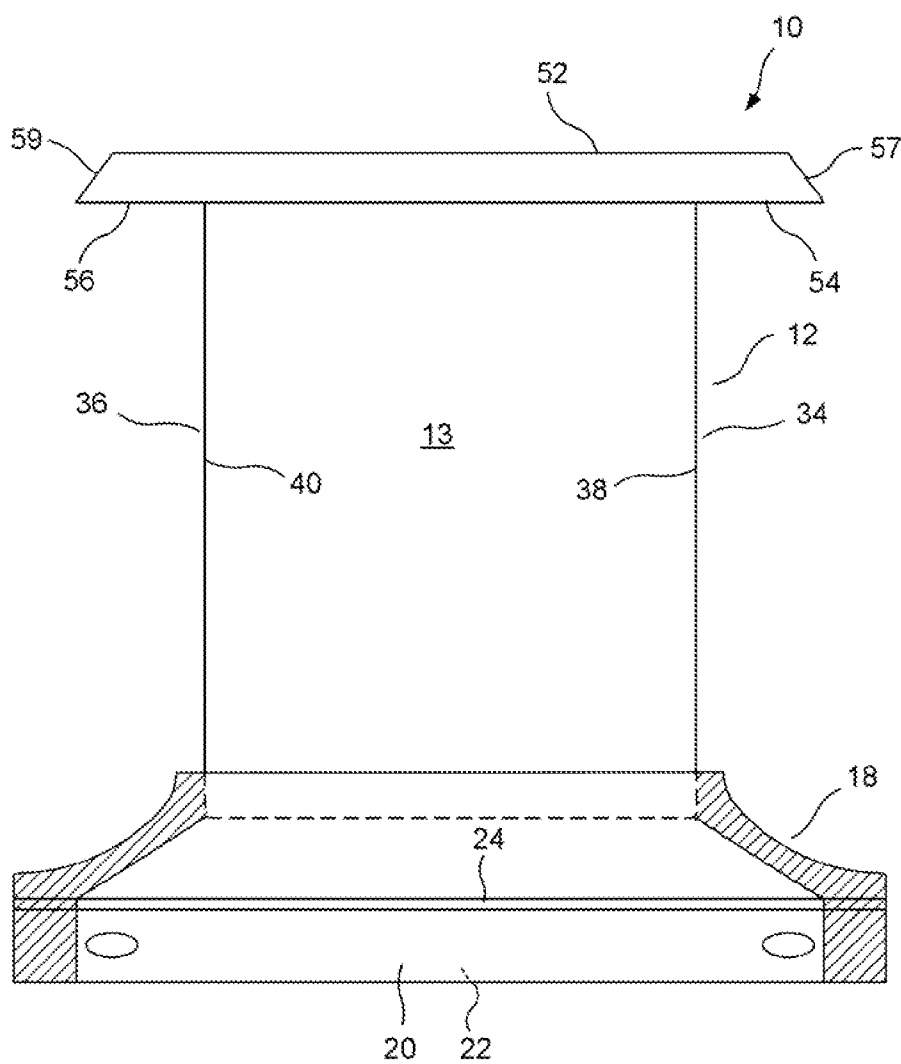


FIG. 4A

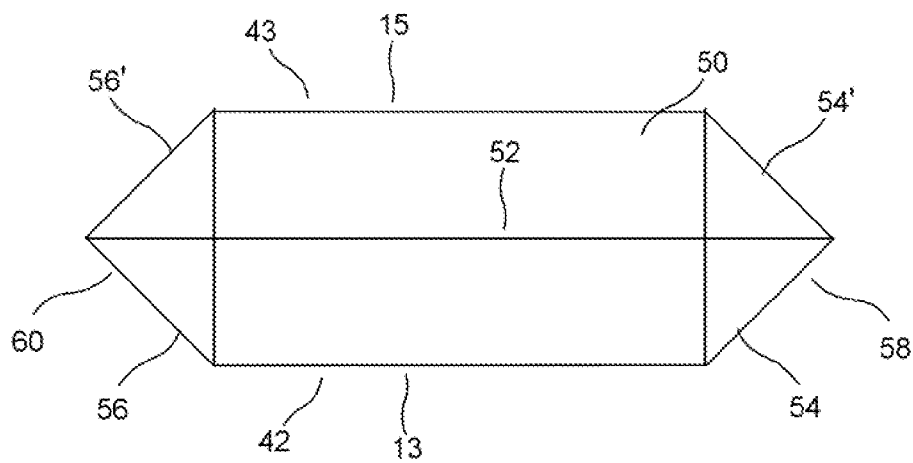


FIG. 4B

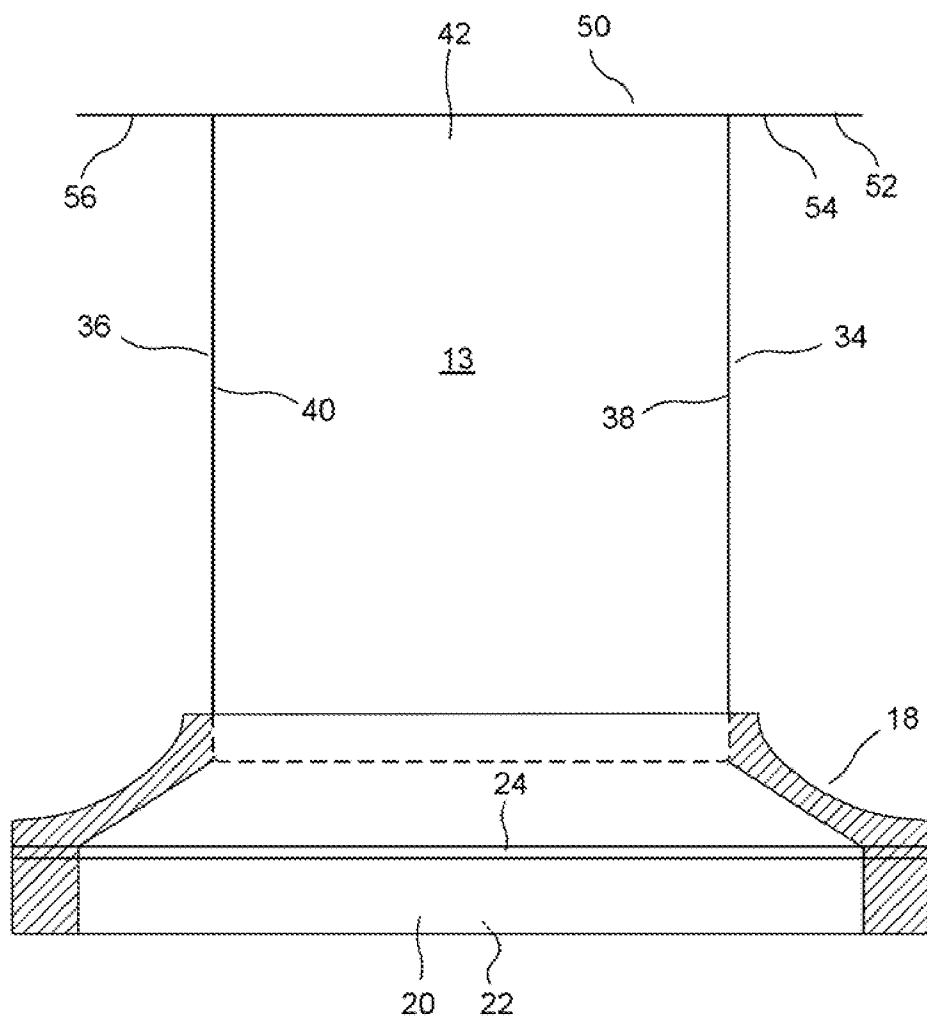


FIG. 5A

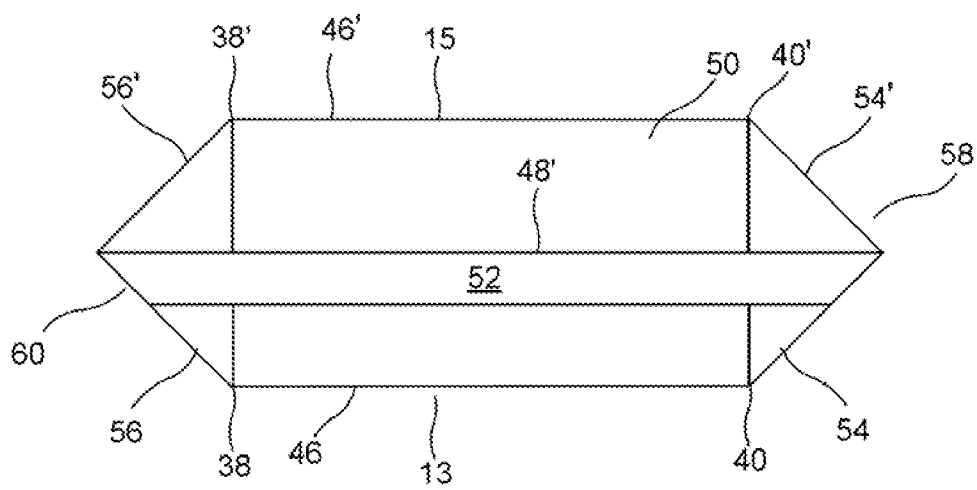


FIG. 5B

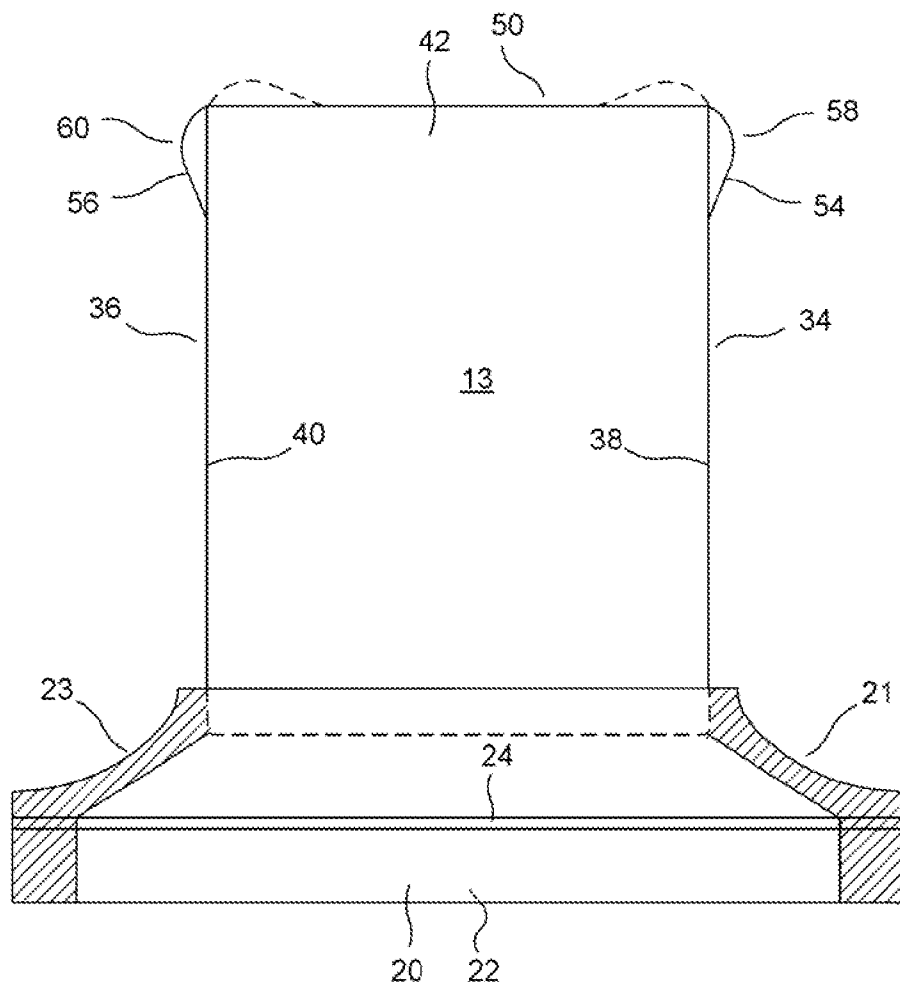


FIG. 6A

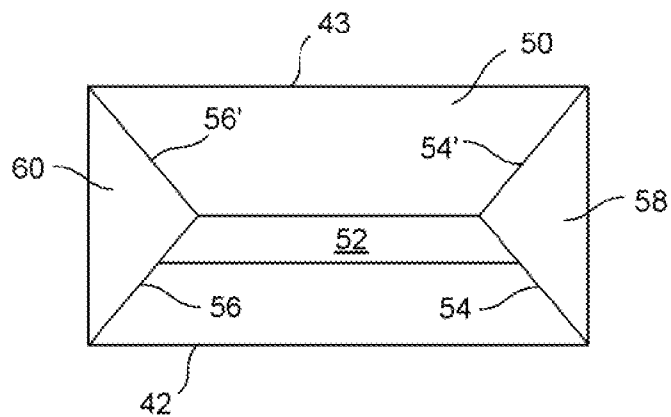


FIG. 6C

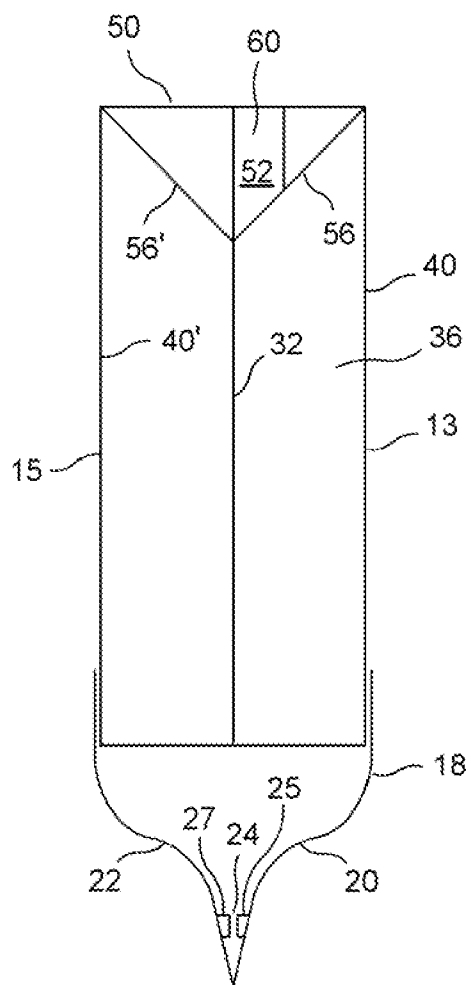


FIG. 6B

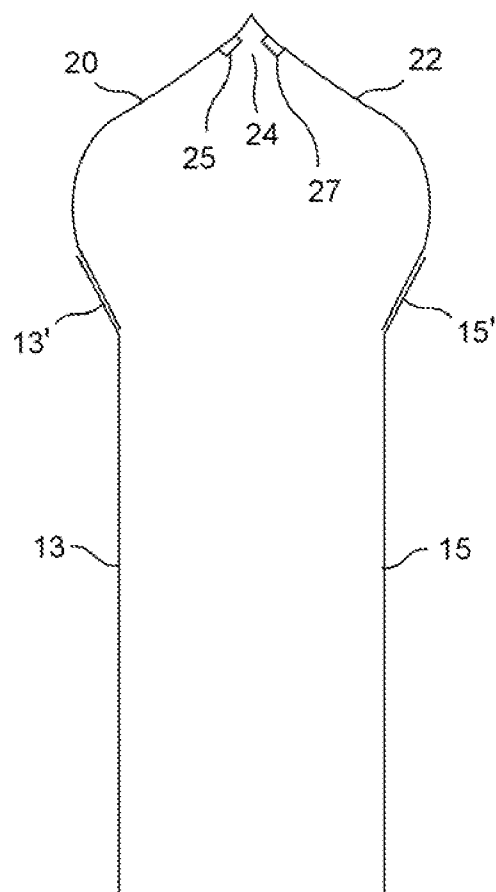


FIG. 6D

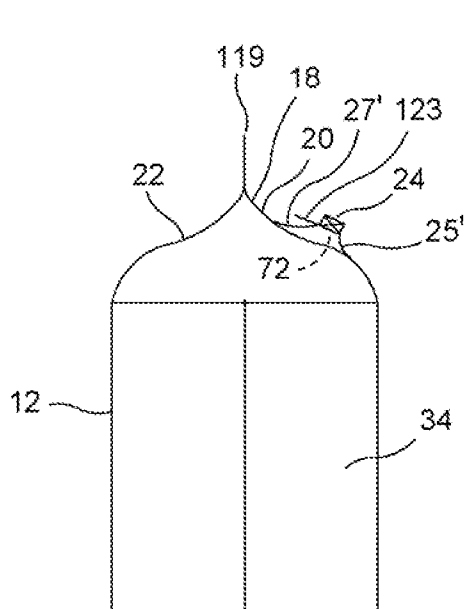


FIG. 6E

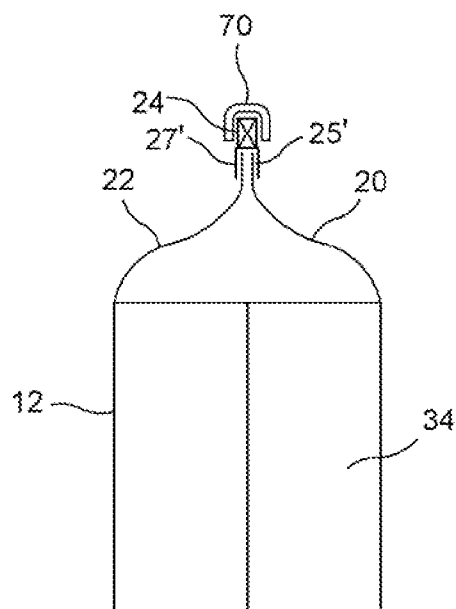


FIG. 6G

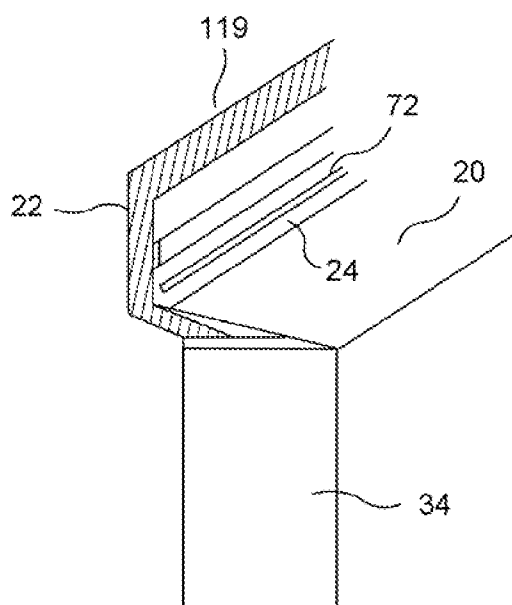


FIG. 6F

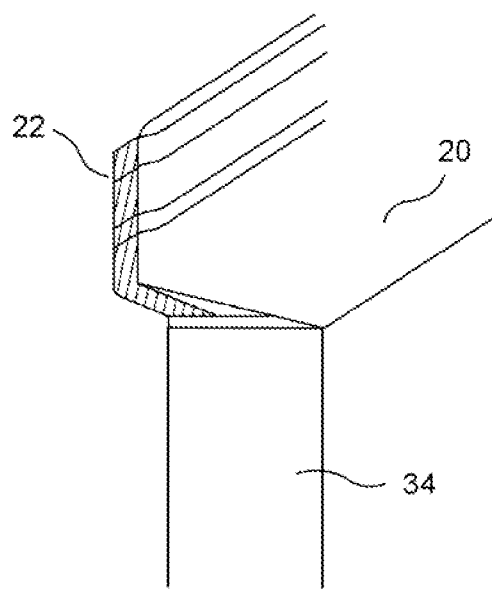
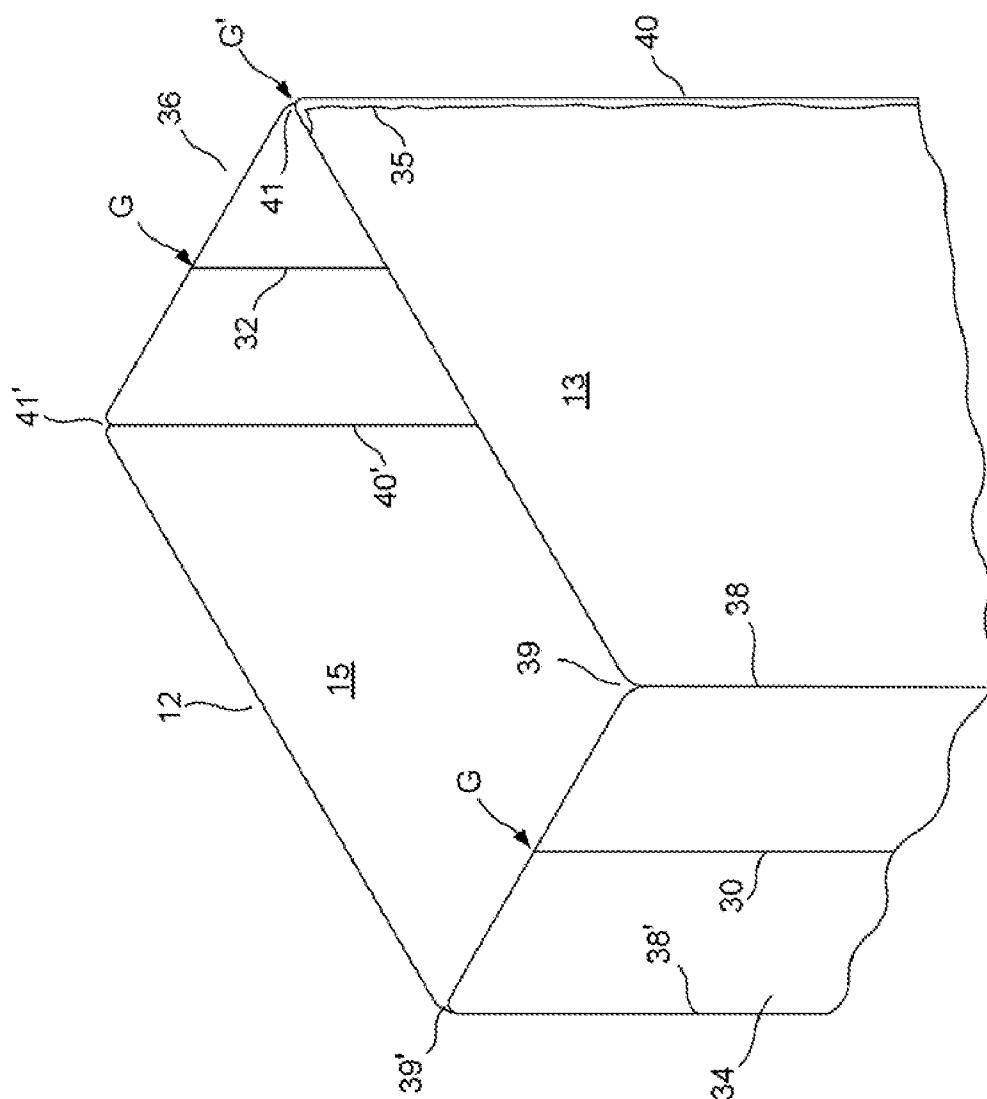


FIG. 6H





761

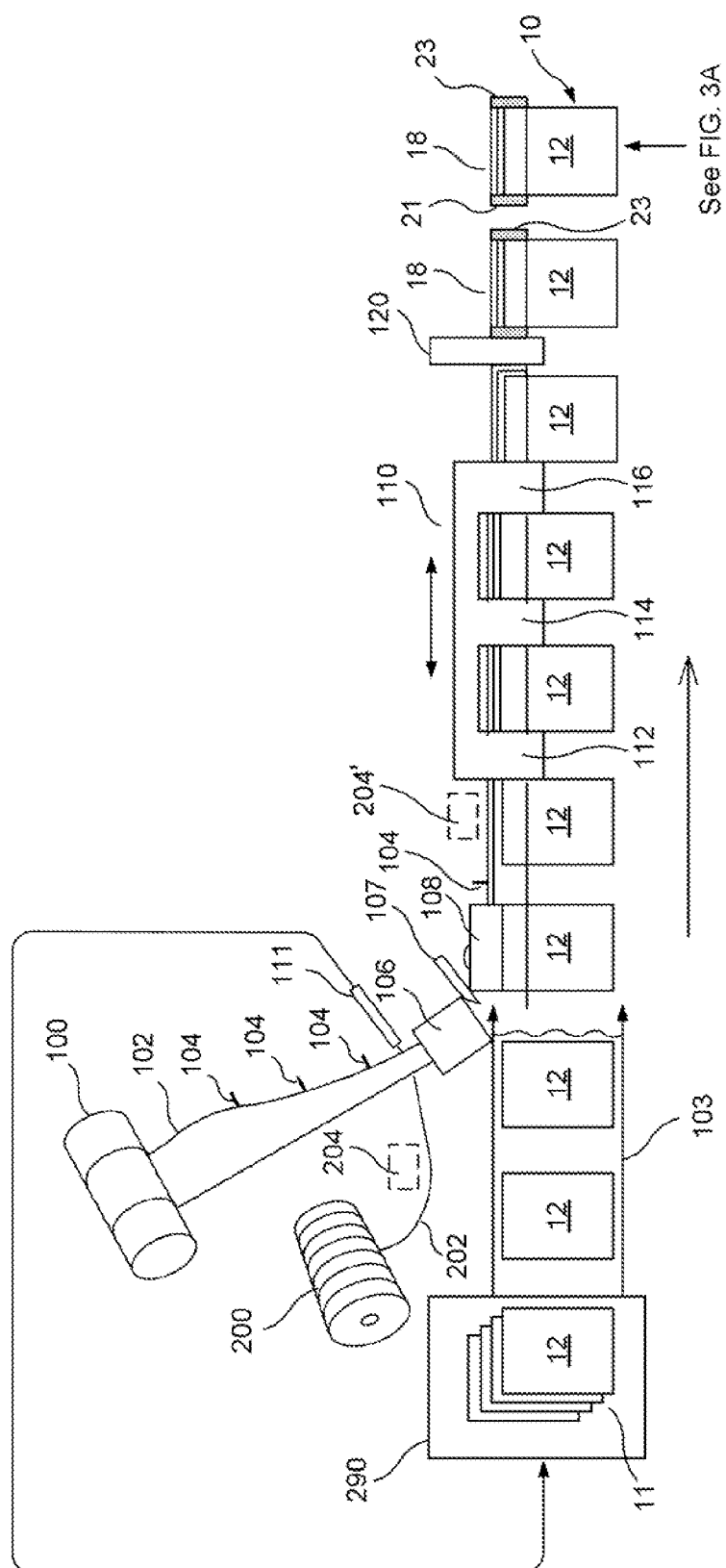
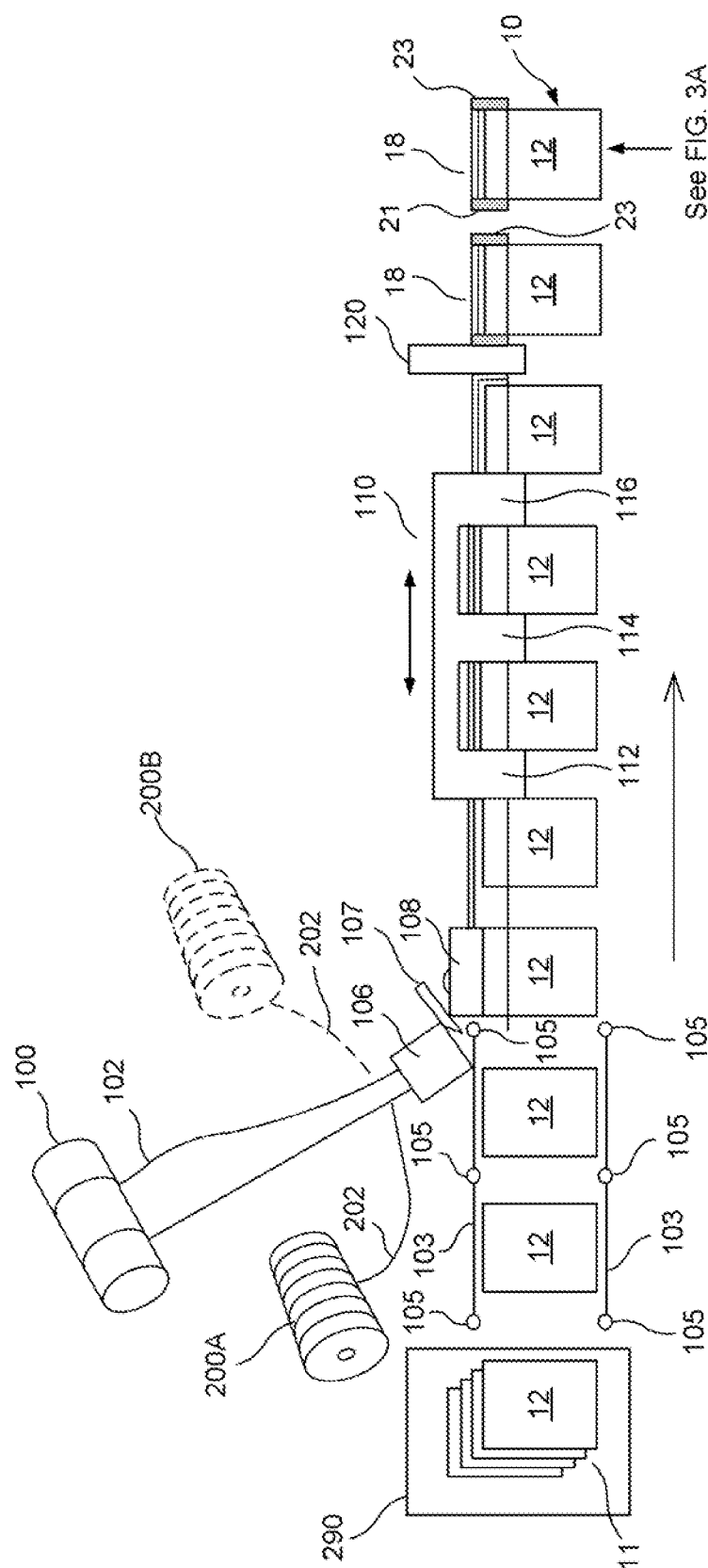
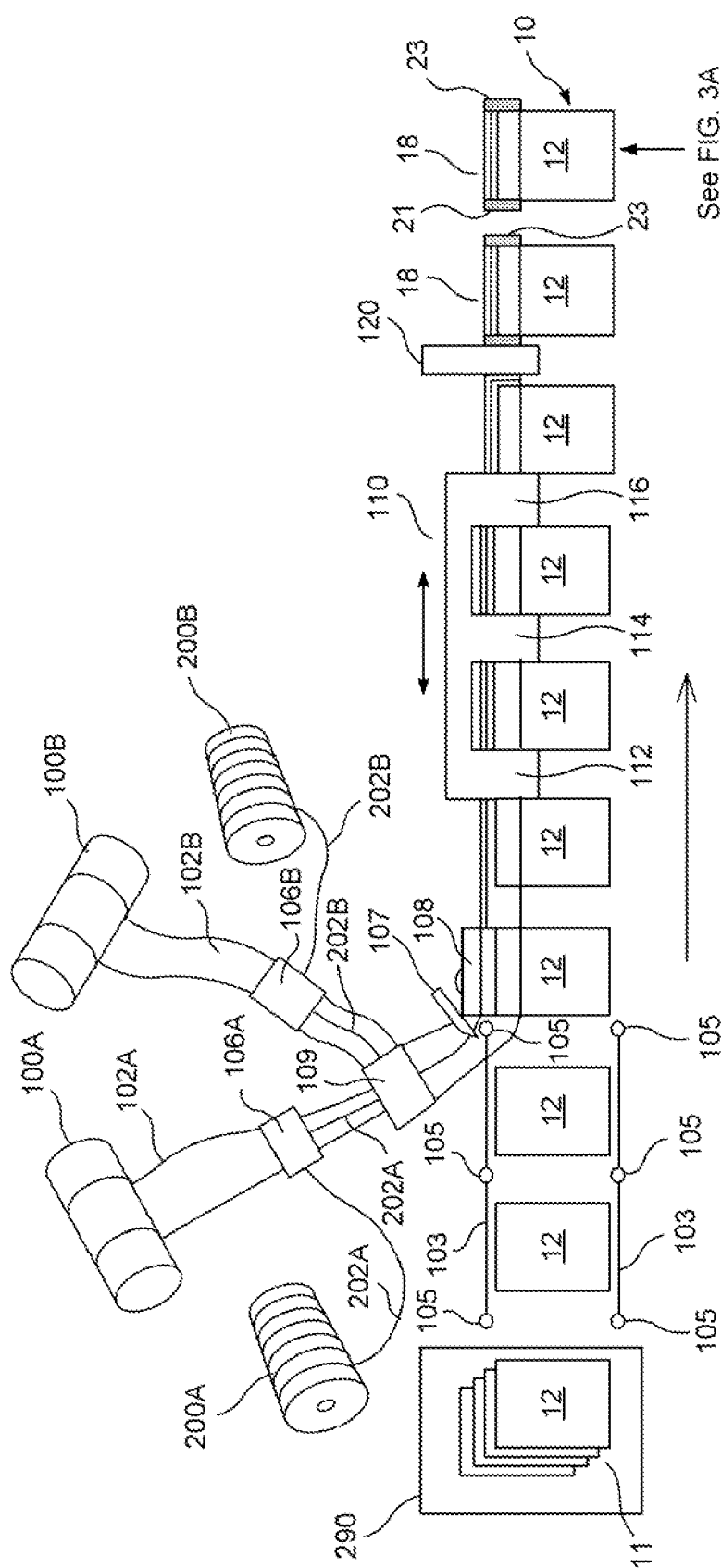
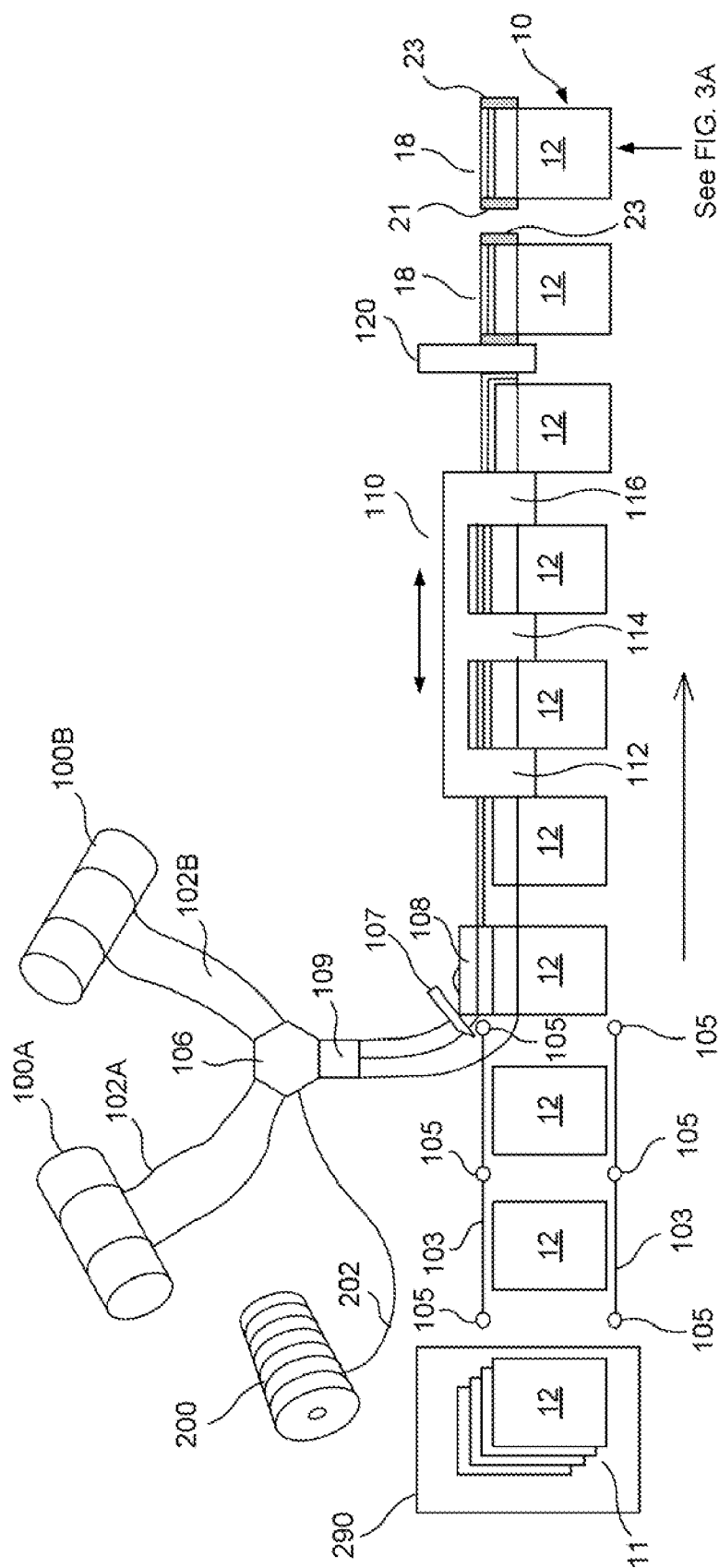


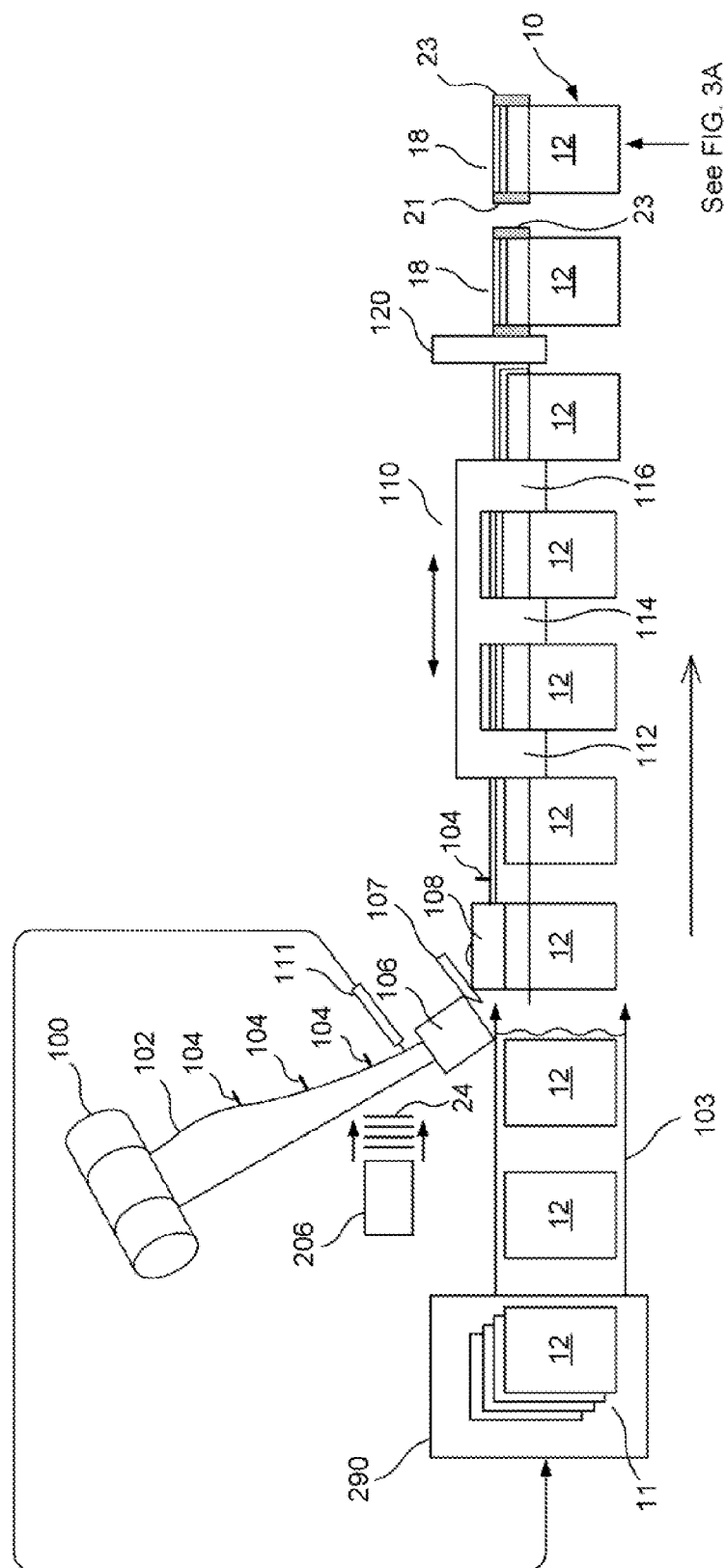
FIG. 8A



88-161







LE  
8  
G  
—  
LE

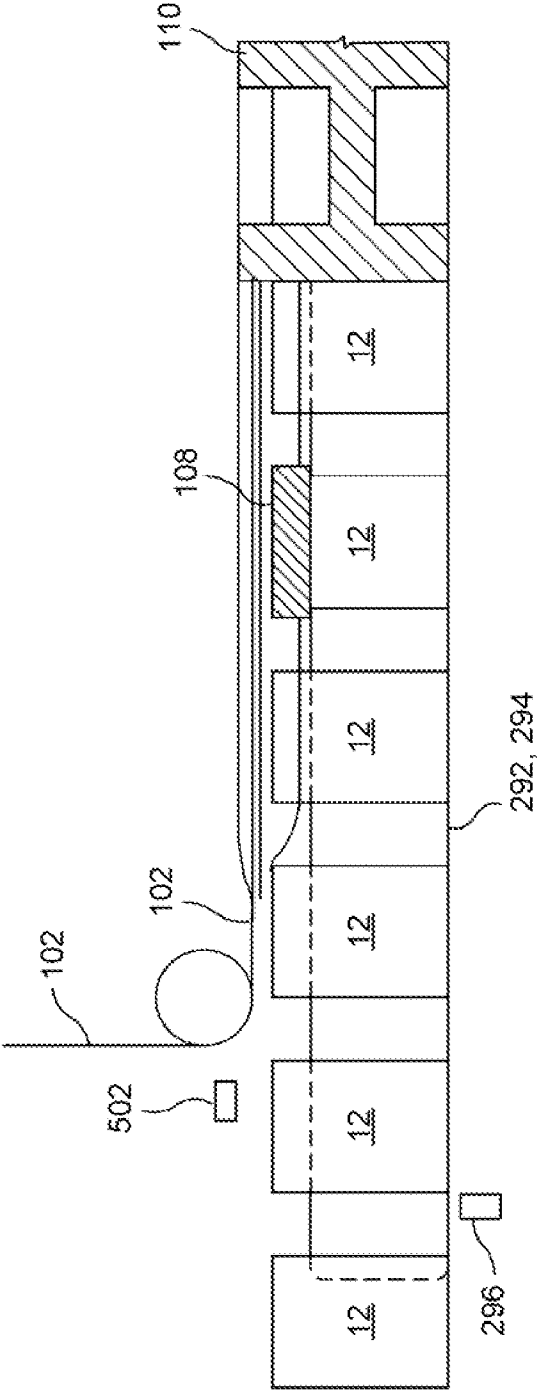


FIG. 8F

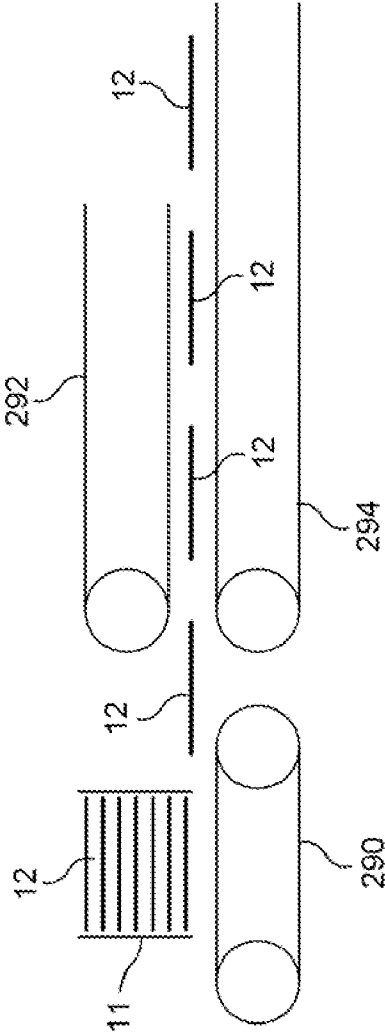


FIG. 8G

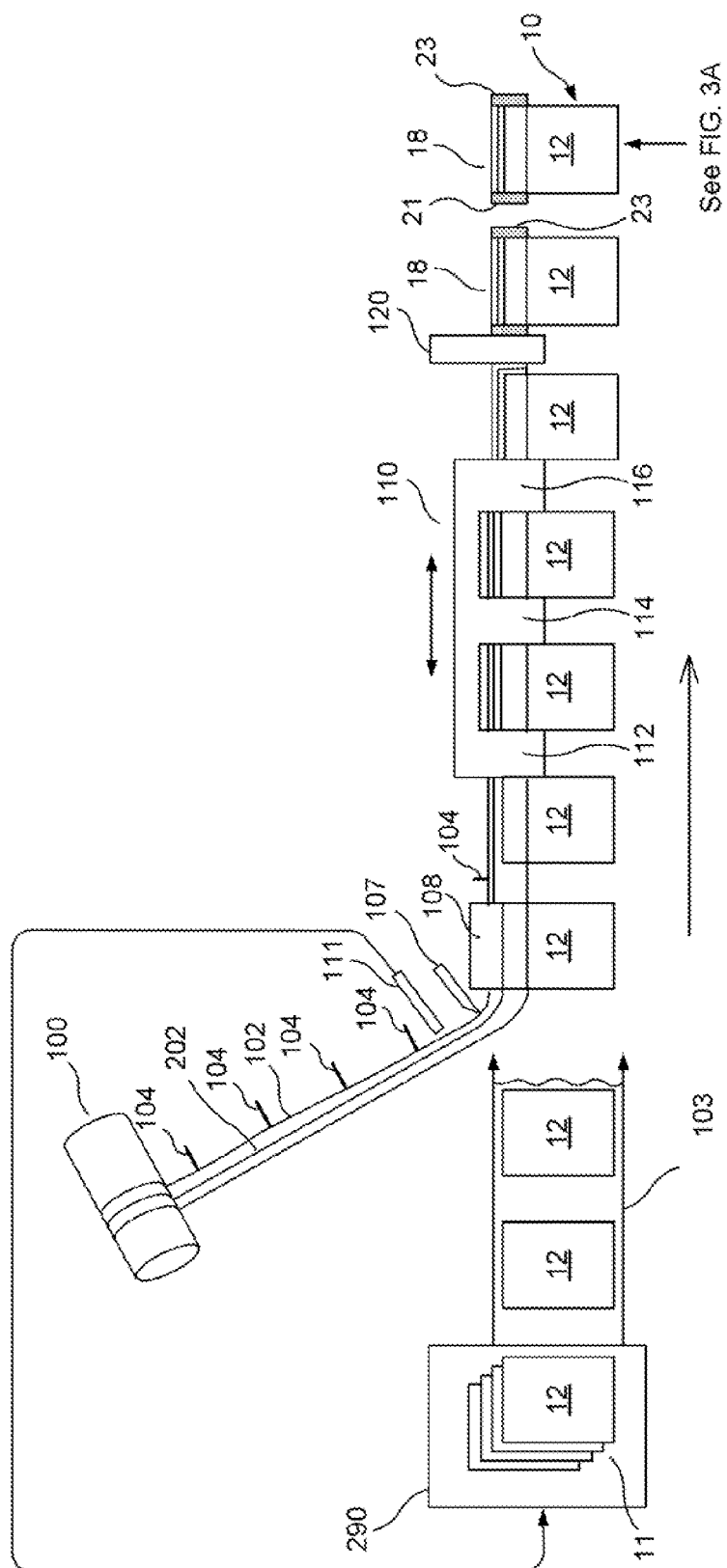


FIG. 9A



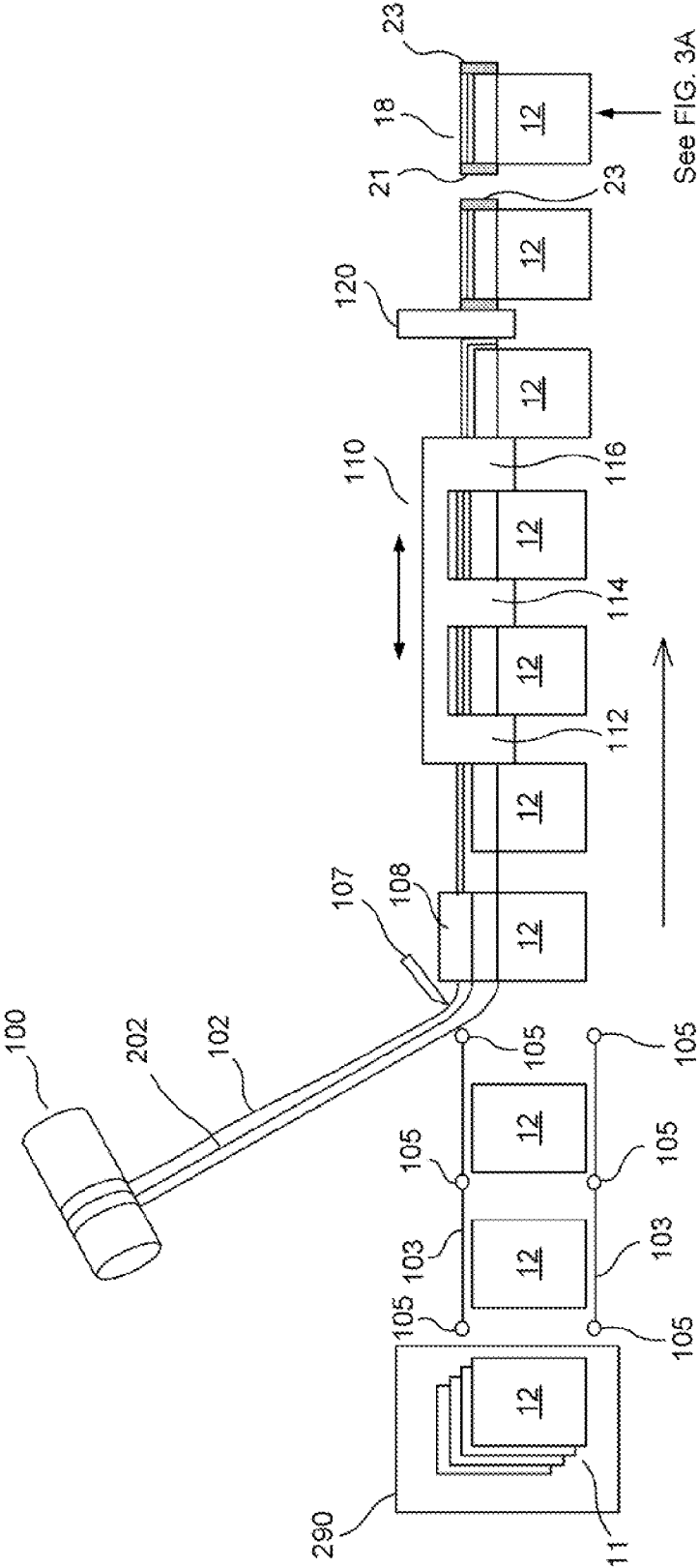


FIG. 9B

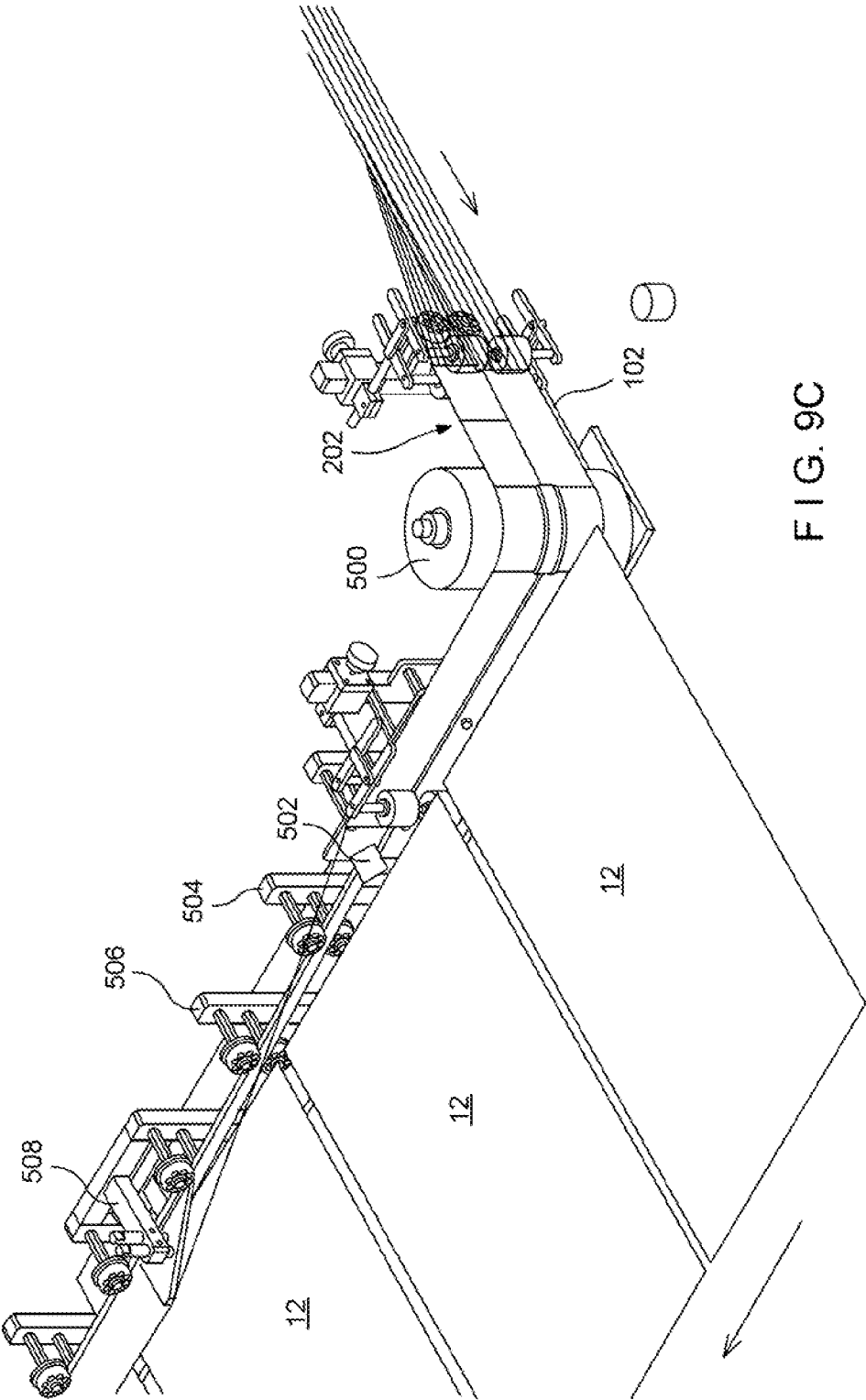


FIG. 9C

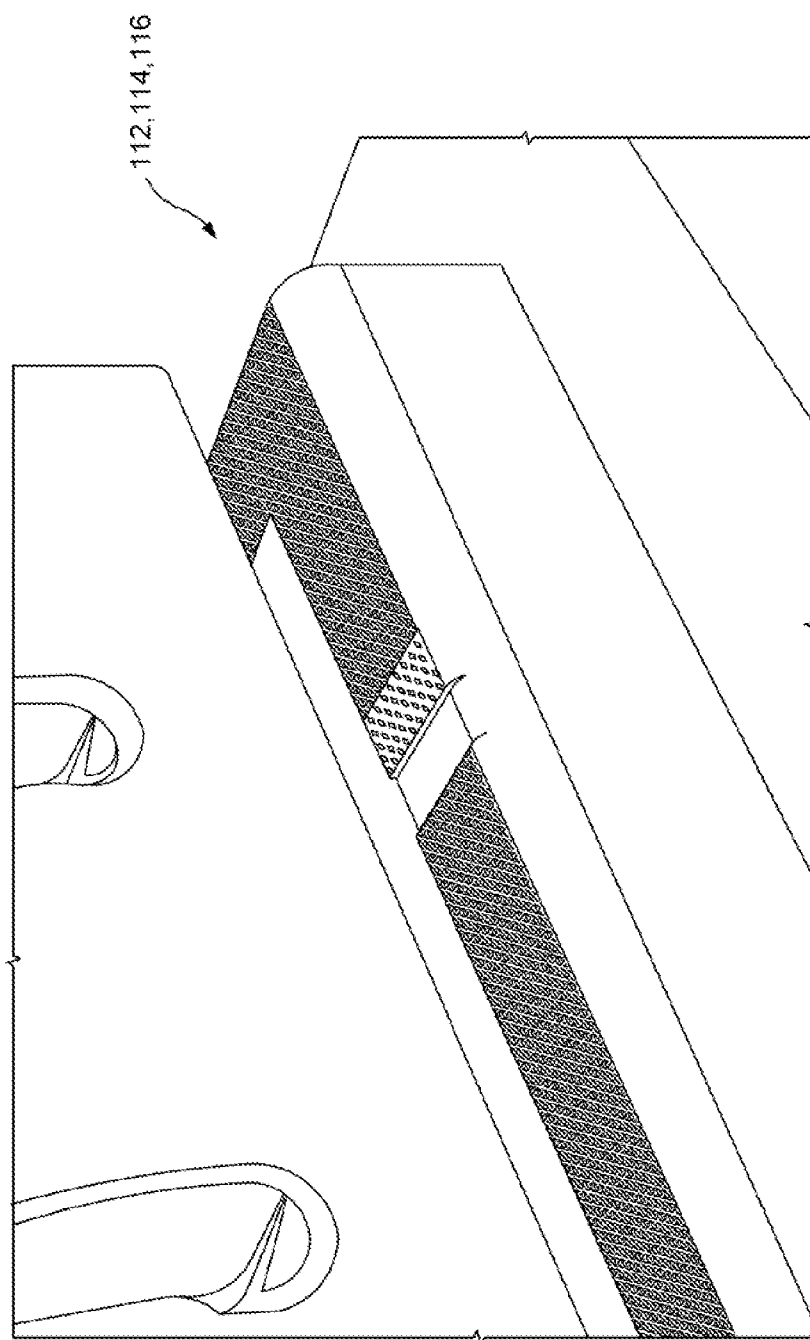


FIG. 10

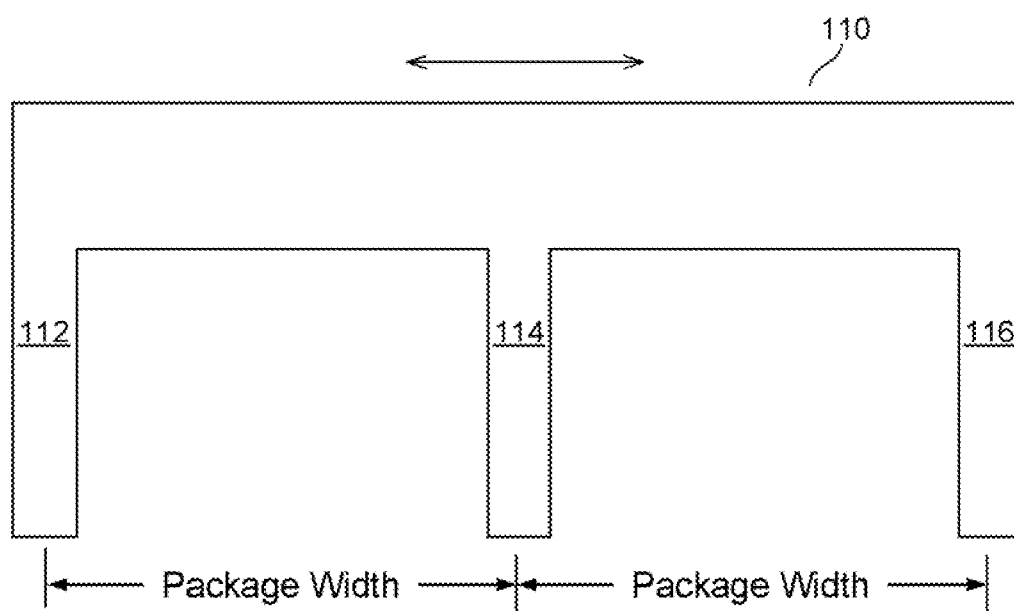


FIG. 11

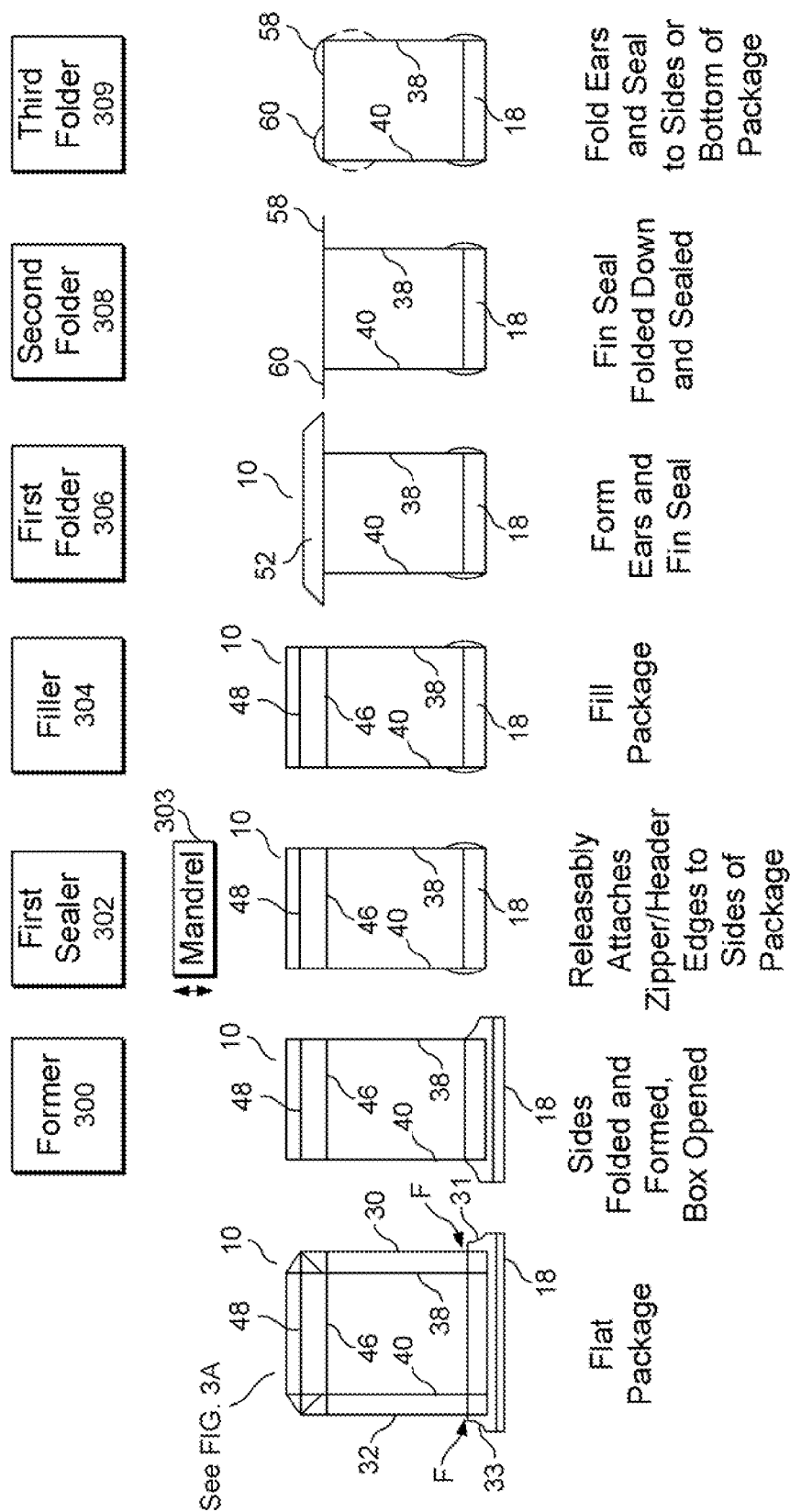


FIG. 12

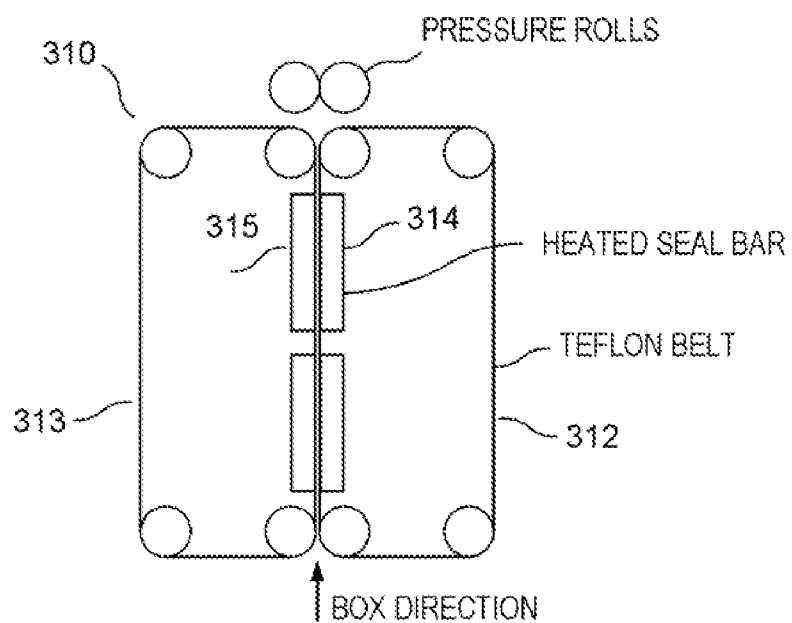


FIG. 13

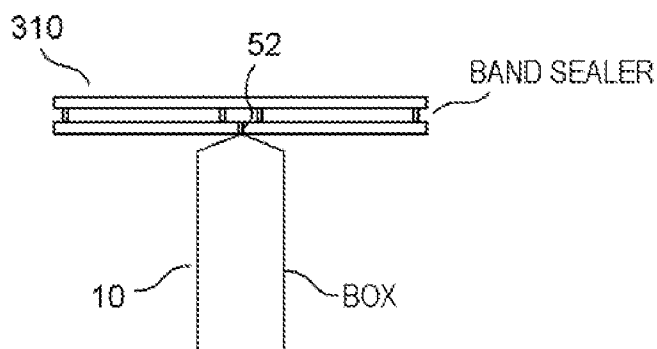


FIG. 14

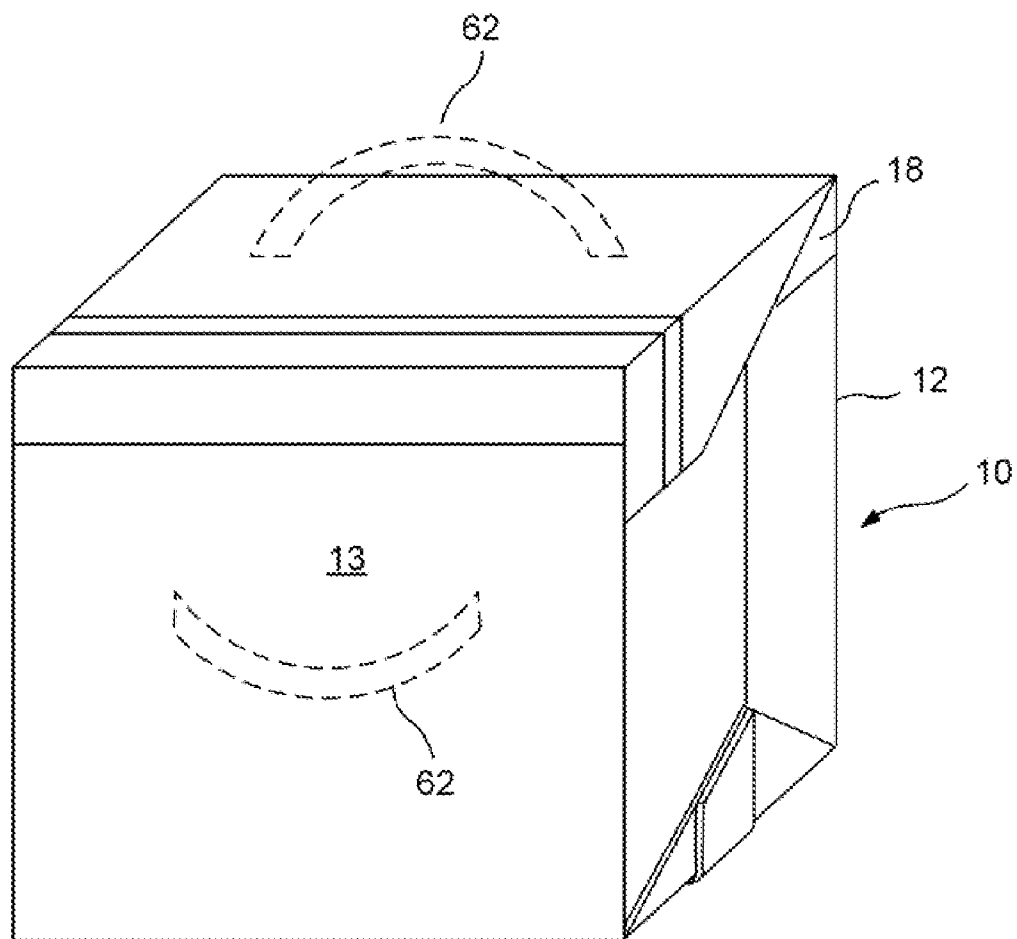


FIG. 15A

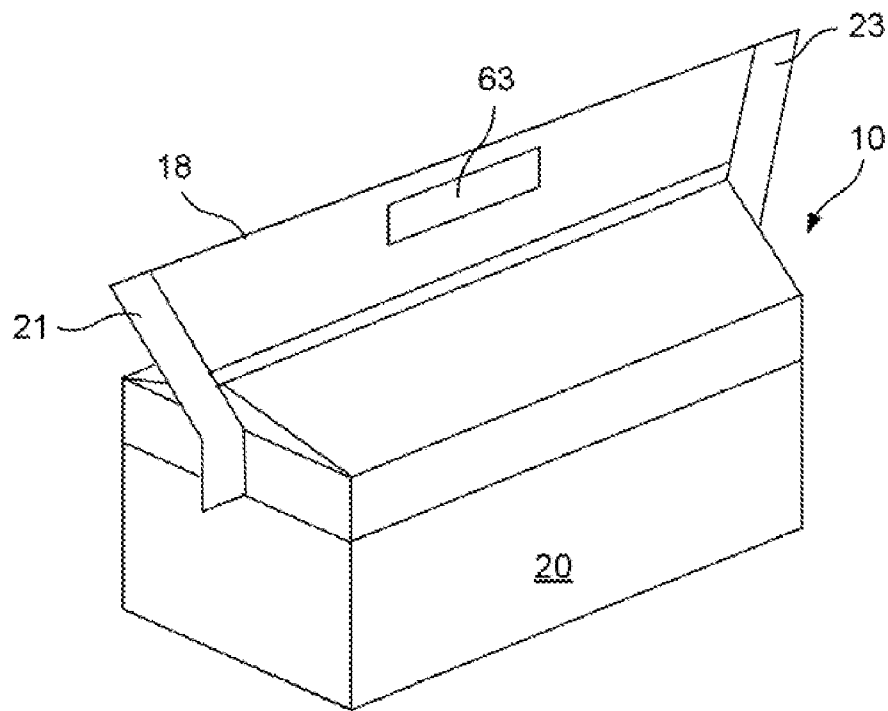


FIG. 15B

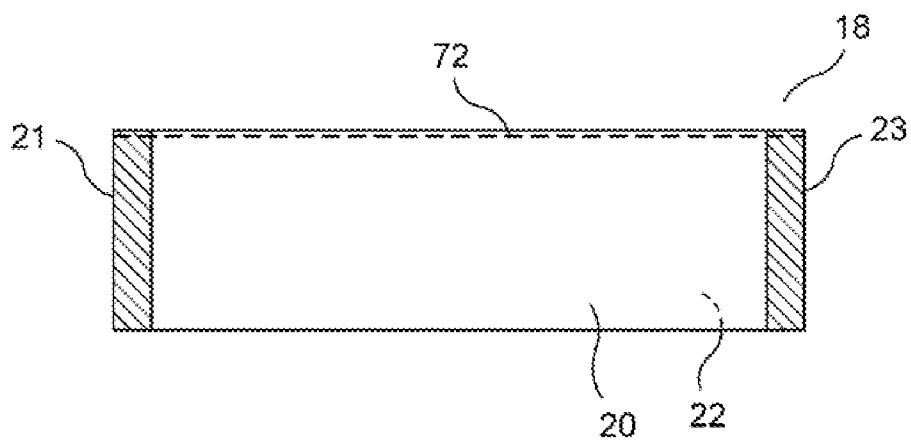


FIG. 16



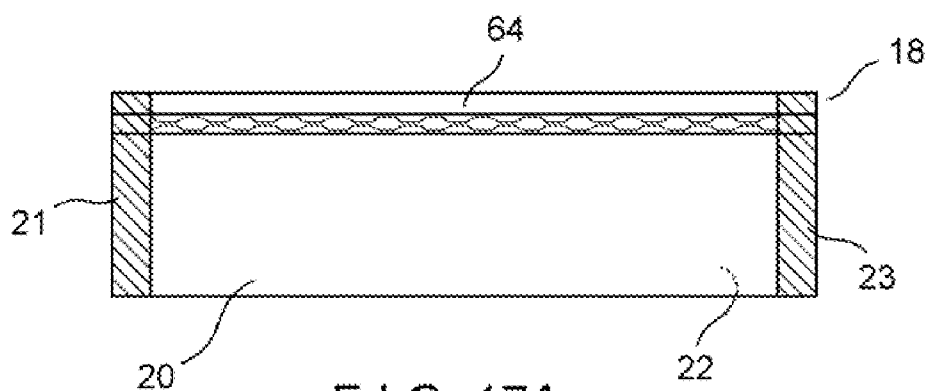


FIG. 17A

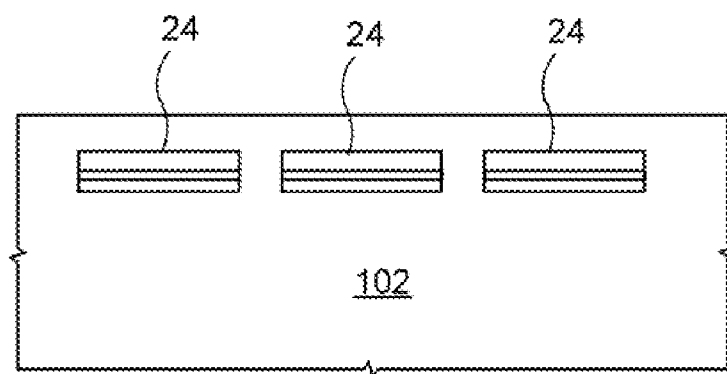


FIG. 17B

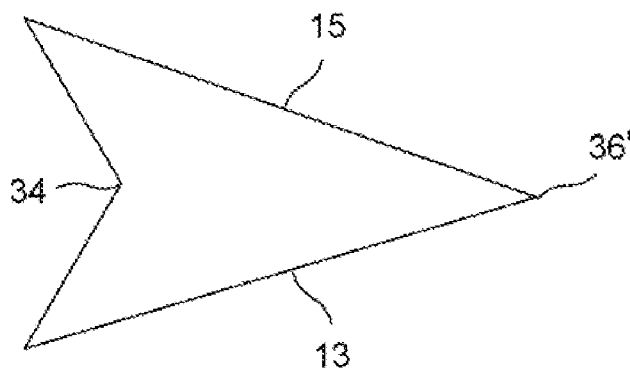


FIG. 18

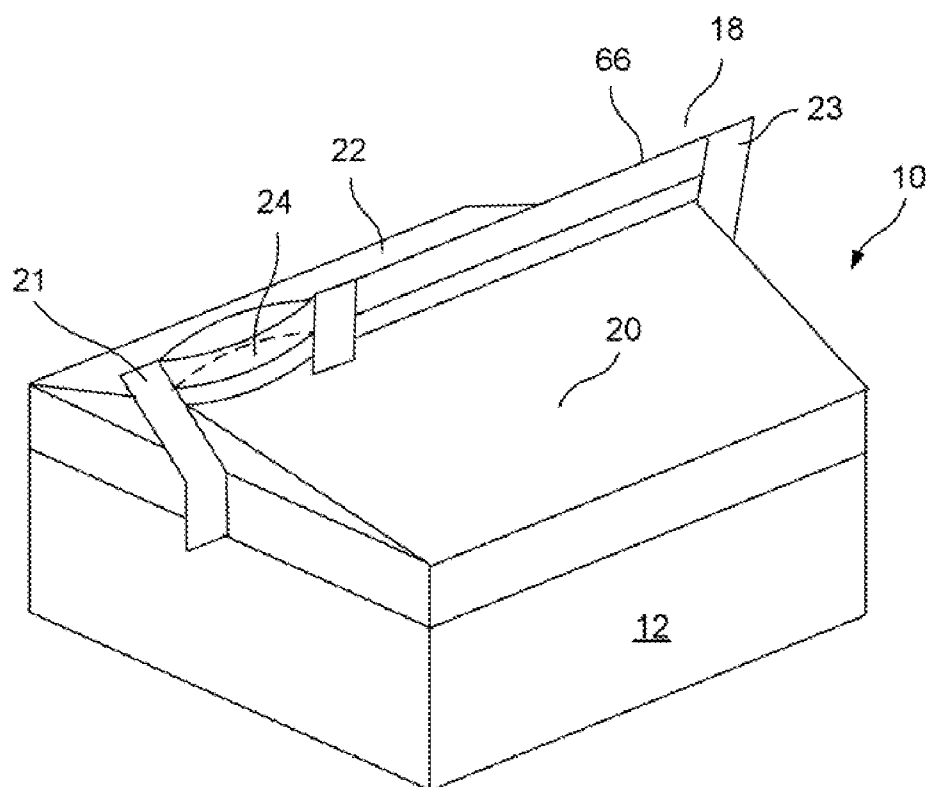


FIG. 19A

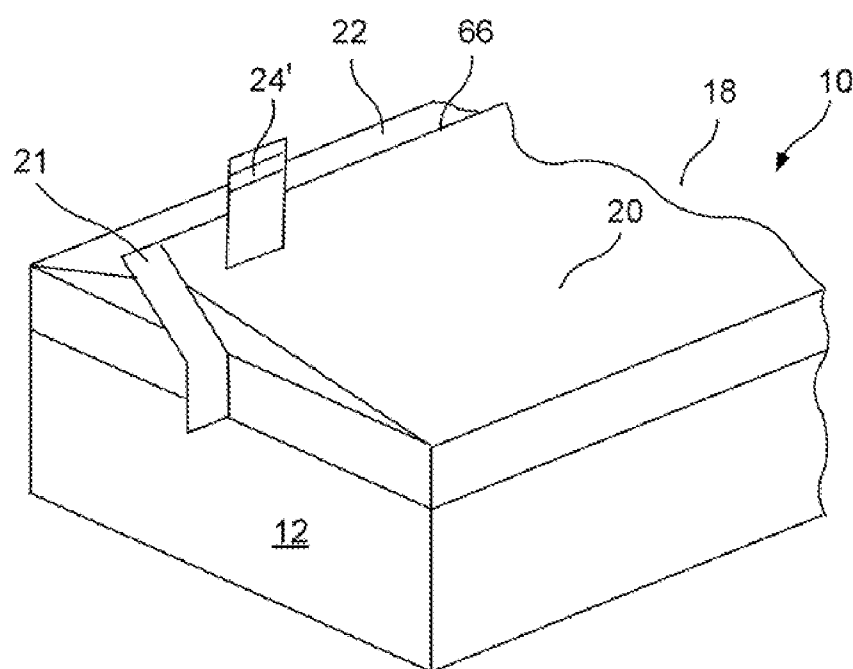


FIG. 19B

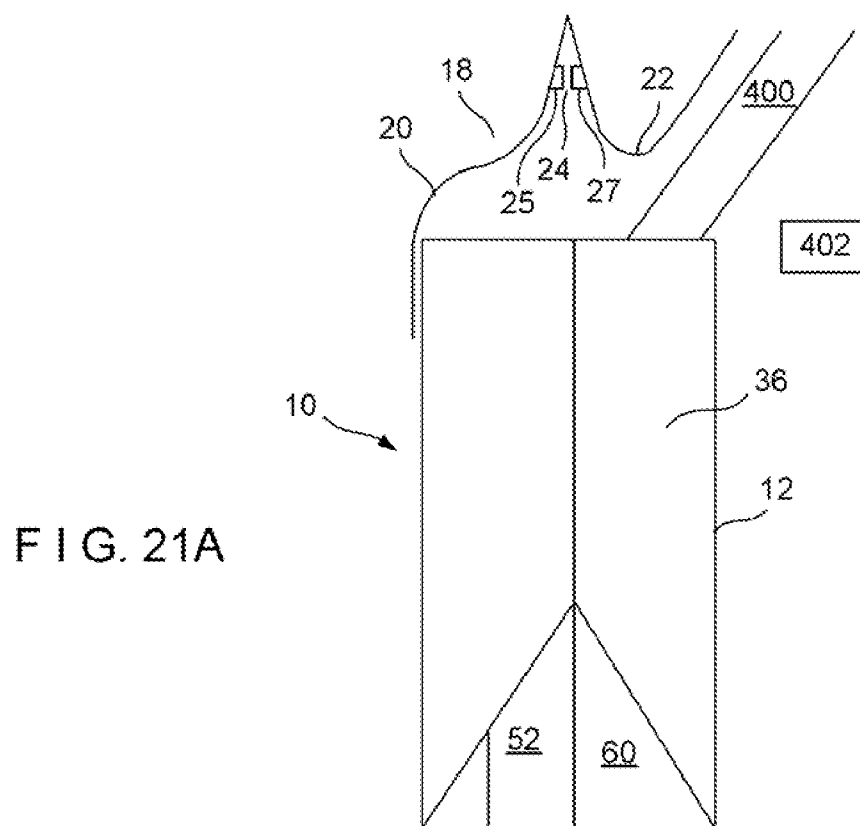
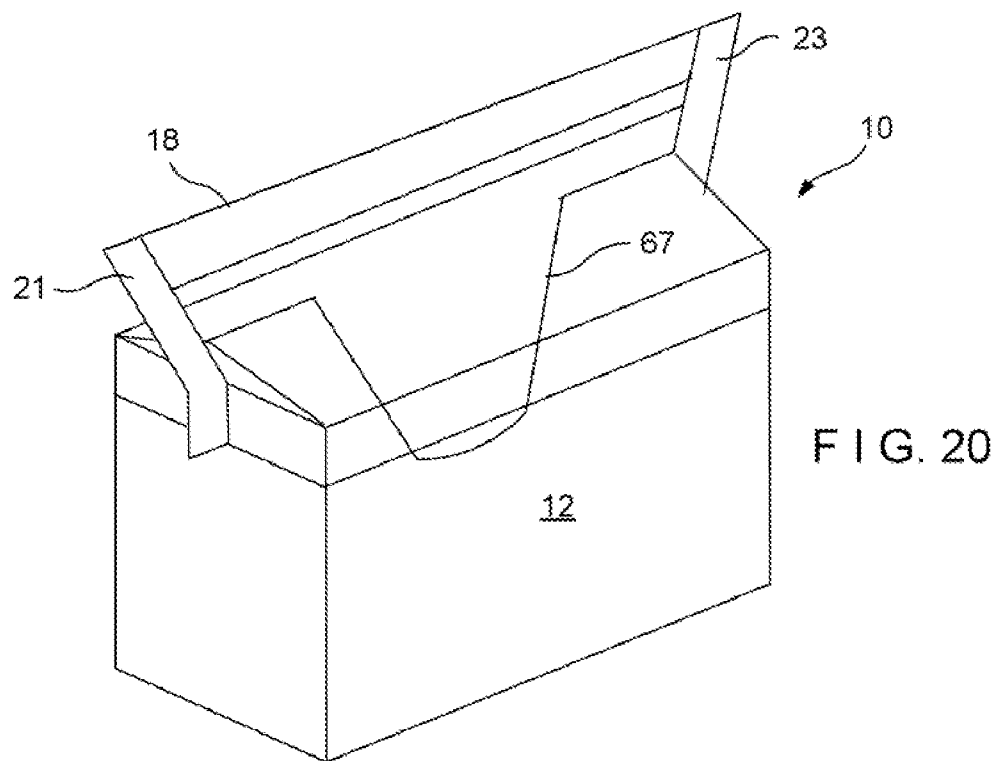


FIG. 21B

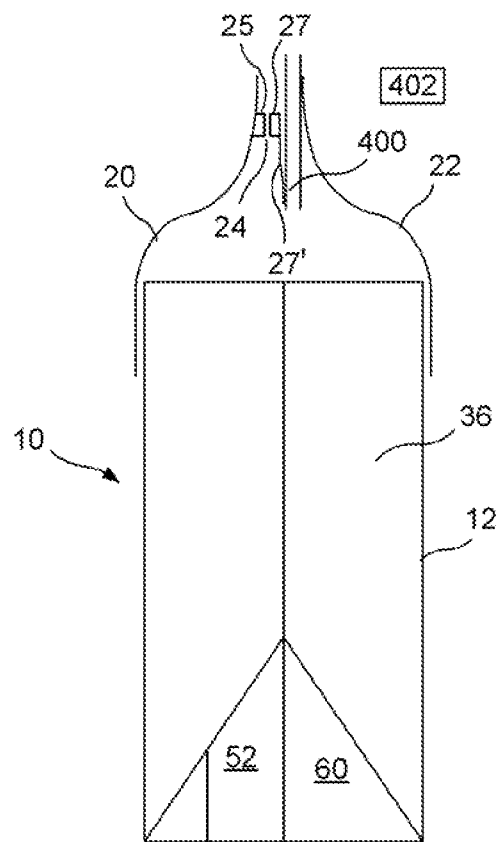
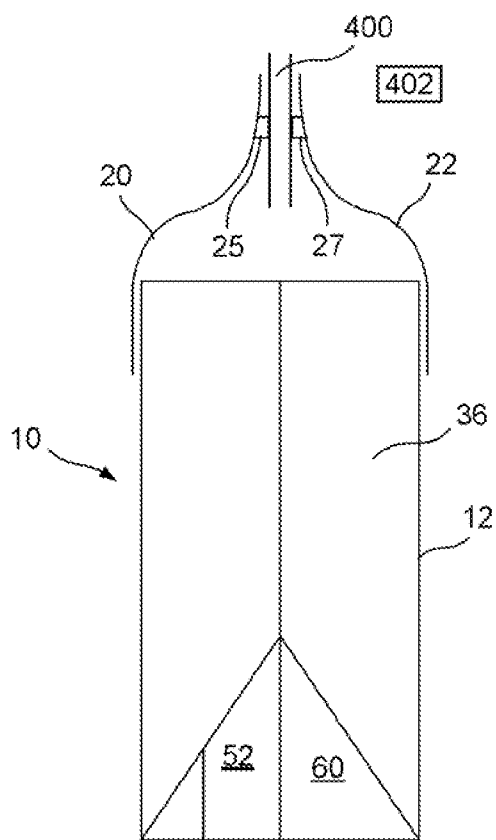


FIG. 21C



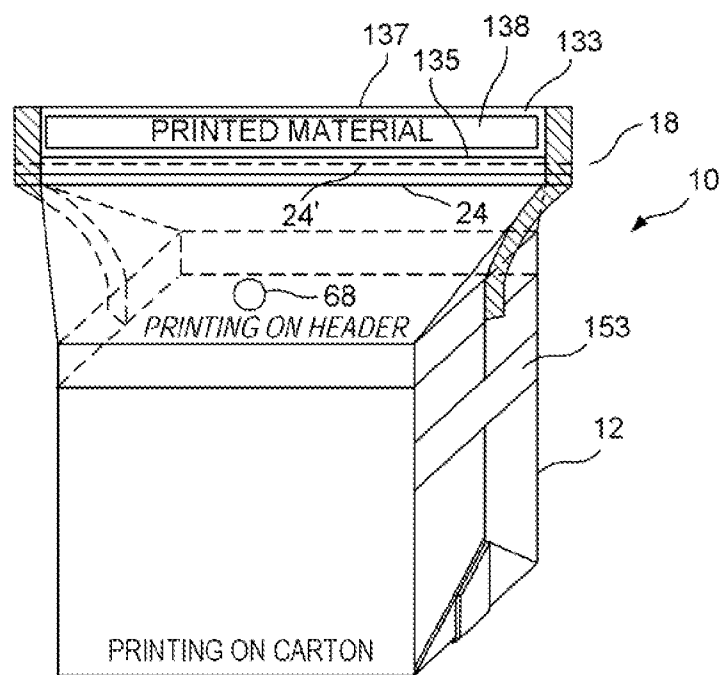


FIG. 22

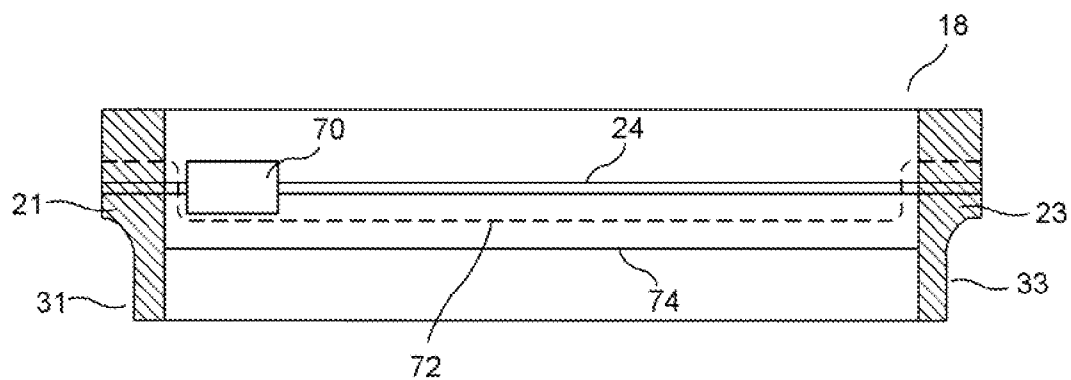


FIG. 23

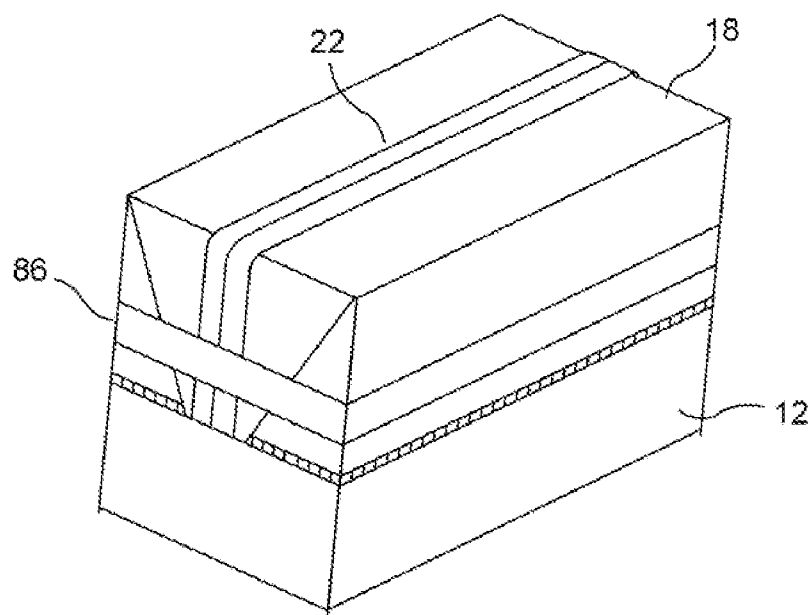
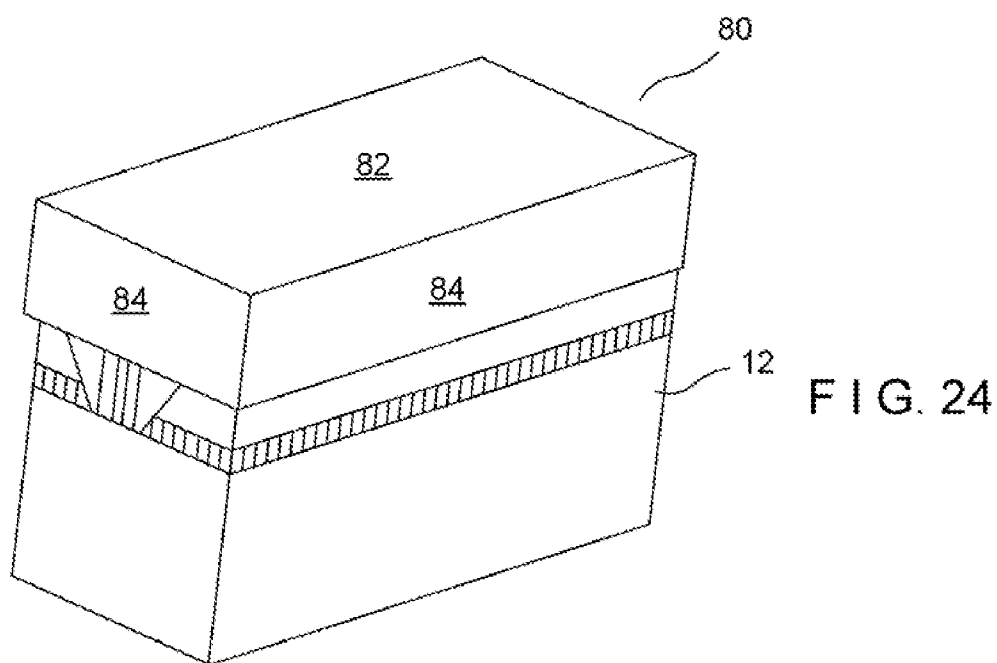


FIG. 25



FIG. 27A

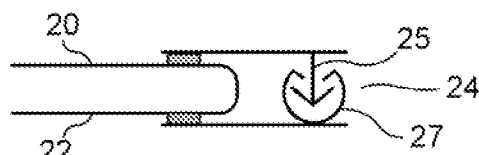


FIG. 27B

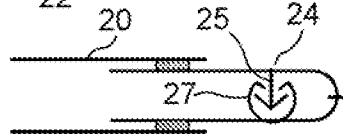


FIG. 27C

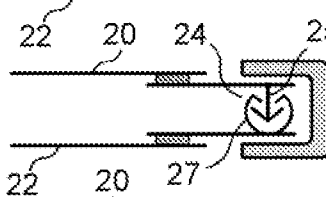


FIG. 27D

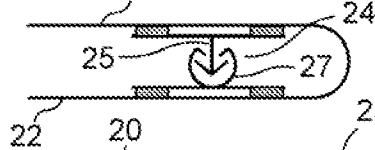


FIG. 27E

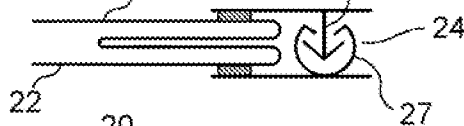


FIG. 27F

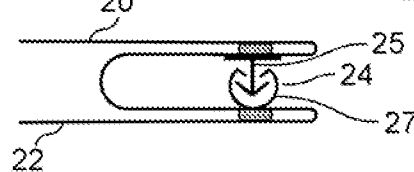


FIG. 27G

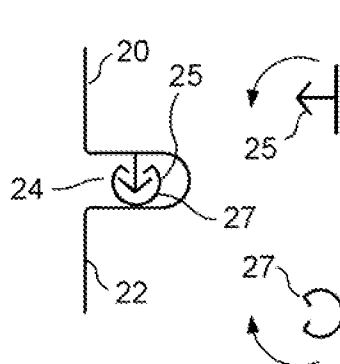


FIG. 27H

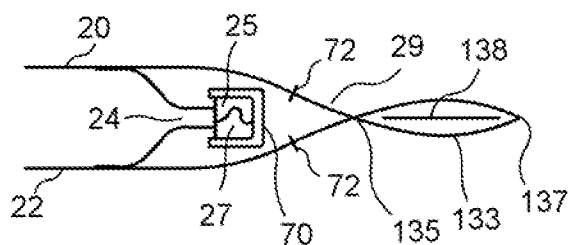
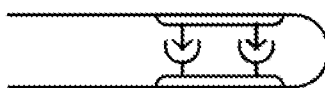


FIG. 27I





## CARTON WITH PLASTIC RECLOSABLE HEADER

### BACKGROUND OF THE DISCLOSURE

**[0001]** This application claims priority under 35 U.S.C. §119(e) of provisional patent application Ser. No. 61/249,852, filed on Oct. 8, 2009 and provisional patent application Ser. No. 61/298,429, filed Jan. 26, 2010, the contents of both of which are incorporated by reference in their entirety.

### FIELD OF THE DISCLOSURE

**[0002]** The present disclosure relates to a method and apparatus for producing a package with a carton-type container made from paper, cardboard, chipboard or similar rigid or semi-rigid material with attached thereto a reclosable header section made from plastic, polymer or other flexible material, the reclosable structure being typically a zipper, but not limited thereto. The present disclosure likewise relates to the resulting package.

### DESCRIPTION OF THE PRIOR ART

**[0003]** In the prior art, it is known to make reclosable flexible plastic bags for the sale of foodstuffs or other consumer products. The bags or packages, while well suited for their intended uses, have typically not been used for food products that would easily be crushed or damaged during shipment. Additionally, such bags or packaging can result in inefficiencies in storage, transportation and display.

**[0004]** Likewise, traditional cardboard boxes are well-known for the packaging and marketing of such well-established products as cereal. However, these boxes typically are heavy and require an internal waxed paper or similar liner, typically tearable and therefore not resealable and do not protect the contents after initial opening. This increases manufacturing costs and typically does not allow the package to be filled completely with product, thereby resulting in inefficiencies in space, which increases the costs for storage, transportation and display of the product. Therefore, many of these traditional cardboard boxes, particularly those with a tearable plastic liner, have been less than satisfactory in their reclosable capabilities.

**[0005]** There have been several attempts at packages to address these deficiencies, but none have been entirely satisfactory. These previous attempts include those disclosed in U.S. Pat. No. 7,524,111 entitled "Rigid-Bottomed Resealable Bag with Handles", issued on Apr. 28, 2009 to Williams; U.S. Pat. No. 7,207,716 entitled "Flexible Container Having Flat Walls", issued on Apr. 24, 2007 to Buchanan; U.S. Pat. No. 7,160,029 entitled "Enclosure for Resealing a Package and Method Therefor", issued on Jan. 9, 2007 to Bein; U.S. Pat. No. 6,908,422 entitled "Reclosable Packaging Bag and Method for Manufacturing Same", issued on Jun. 21, 2005 to Ichikawa et al.; U.S. Pat. No. 6,110,512 entitled "Package and Merchandiser", issued on Aug. 29, 2000 to Teasdale; U.S. Pat. No. 6,063,416 entitled "Procedure and Package to Enable Peg Display of Food Pouch in Tent-Style Paperboard Carton", issued on May 16, 2000 to Teasdale et al.; U.S. Pat. No. 4,691,373 entitled "Zipper Closure with Unitary Adhesive Cover Sheet", issued on Sep. 1, 1987 to Ausnit; and U.S. Published Patent Application No. 2005/0194386, entitled "Zipper Box Covers" published on Sep. 8, 2005 for Shai; and

Japanese Patent No. 2002104511 entitled "Bag-in-Carton", published on Apr. 10, 2002 for Makoto et al.

### SUMMARY AND OBJECTS OF THE DISCLOSURE

**[0006]** It is therefore an object of the present disclosure to provide a reclosable package which has rigid walls thereby providing a high capacity, space-efficient package with a flat printing surface thereby providing protection for the packaging of crushable or delicate products.

**[0007]** It is therefore a further object of the present disclosure to provide a package which is light in weight and which is typically reclosable.

**[0008]** These and other objects are attained by the present disclosure by providing a package, along with a method and apparatus for the production thereof, which includes a rigid or semi-rigid carton-type container and, attached thereto, a plastic, polymer, or similar flexible header, typically with a reclosable zipper configuration, but not limited thereto.

### BRIEF DESCRIPTION OF THE DRAWINGS

**[0009]** Further objects and advantages of the disclosure will become apparent from the following description and from the accompanying drawings, wherein:

**[0010]** FIG. 1 is a perspective view of an embodiment of a package of the present disclosure, shown in a filled configuration with a sealed bottom and an upwardly projecting header.

**[0011]** FIG. 2 is a perspective view of an embodiment of a package of the present disclosure, shown in a filled configuration with a sealed bottom and a flush header.

**[0012]** FIG. 3A is a plan front view of an embodiment of a package of the present disclosure, shown in a flat, unfilled configuration, with an upwardly projecting header and an unsealed bottom.

**[0013]** FIG. 3B is a cross-sectional view of typical material used for the rigid or semi-rigid container portion of embodiments of the present disclosure.

**[0014]** FIG. 3C is a perspective view showing the header attached to the interior of the container portion of the package.

**[0015]** FIG. 4A is a plan view of an embodiment of an inverted package of the present disclosure, showing the bottom partially folded, typically after bottom filling, with the bottom fin seal pointing upwardly.

**[0016]** FIG. 4B is a plan view from above of the embodiment of the inverted package of FIG. 4A.

**[0017]** FIG. 5A is a plan view of an embodiment of an inverted package of the present disclosure, showing the bottom partially folded, typically after bottom filling, with the bottom fin seal folded flush with the bottom of the package.

**[0018]** FIG. 5B is a plan view from above of the embodiment of the inverted package of FIG. 5A.

**[0019]** FIG. 6A is a plan view of an embodiment of an inverted package of the present disclosure, similar to FIG. 1, showing the ears of the bottom folded against the sides of the package and sealed thereto, typically after bottom filling.

**[0020]** FIG. 6B is a side plan view of the embodiment of the inverted package of FIG. 5A.

**[0021]** FIG. 6C is a bottom view of an embodiment of the package, shown with the ears folded and sealed to the bottom of the package.

[0022] FIG. 6D is a cross-sectional view of an embodiment of the package, shown with flaps on the front and rear panels for the interior attachment of the header portion.

[0023] FIG. 6E is a side view of a further embodiment of the package of the present disclosure.

[0024] FIG. 6F is a perspective view showing the embodiment of the package of FIG. 6E, with a folded header.

[0025] FIG. 6G is a side view of a still further embodiment of the package of the present disclosure.

[0026] FIG. 6H is a perspective view showing the embodiment of the package of FIG. 6G, with a folded header.

[0027] FIG. 7 is a perspective view of the top of the rigid or semi-rigid container portion of an embodiment of the package of the present disclosure, showing a radius or chamfer formed at the corners thereof.

[0028] FIG. 8A is a schematic view of a first embodiment of a method and apparatus for producing the package of the present disclosure prior to filling.

[0029] FIG. 8B is a schematic view of a second embodiment of a method and apparatus for producing the package of the present disclosure prior to filling, further including a portion in phantom for illustrating a still further variation.

[0030] FIG. 8C is a schematic view of a third embodiment of a method and apparatus for producing the package of the present disclosure prior to filling.

[0031] FIG. 8D is a schematic view of a fourth embodiment of a method and apparatus for producing the package of the present disclosure prior to filling.

[0032] FIG. 8E is a schematic view of a fifth embodiment of a method and apparatus for producing the package of the present disclosure prior to filling.

[0033] FIG. 8F is a schematic view of a sixth embodiment of a method and apparatus for producing the package of the present disclosure prior to filling.

[0034] FIG. 8G is a side view of the sixth embodiment (see FIG. 8F) of a method and apparatus for producing the package of the present disclosure prior to filling.

[0035] FIG. 9A is a schematic view of a seventh embodiment of a method and apparatus for producing the package of the present disclosure prior to filling.

[0036] FIG. 9B is a schematic view of an eighth embodiment of a method and apparatus for producing the package of the present disclosure prior to filling.

[0037] FIG. 9C is a schematic view of a ninth embodiment of a method and apparatus for producing the package of the present disclosure prior to filling.

[0038] FIG. 10 is a perspective view of an embodiment of the ultrasonic apparatus used to form the cross-seals in an aspect of an embodiment of the method and apparatus for producing the package.

[0039] FIG. 11 is a perspective view of an ultrasonic apparatus used to form three cross-seals simultaneously in an aspect of an embodiment of the method and apparatus for producing the package.

[0040] FIG. 12 is a schematic of an embodiment of method and apparatus of the present disclosure for bottom filling and sealing the packages.

[0041] FIG. 13 is a top view of a band sealer used for forming the bottom fin seal in an aspect of an embodiment of the method and apparatus of the present disclosure.

[0042] FIG. 14 is a side view of the band sealer of FIG. 13 forming a bottom fin seal for an inverted package in an aspect of an embodiment of the method and apparatus of the present disclosure.

[0043] FIG. 15A is a plan view of an embodiment of the package of the present disclosure, showing two alternative handle positions.

[0044] FIG. 15B is a perspective view of an embodiment of the package of the present disclosure, showing a handle built into the header.

[0045] FIG. 16 is a plan view of a header of an embodiment of the package of the present disclosure, wherein the header is opened by a perforated line or similar line of weakness.

[0046] FIG. 17A is a plan view of a header of an embodiment of the package of the present disclosure, wherein the header is opened by way of a pre-activated peel seal.

[0047] FIG. 17B is a plan view of discrete zipper segments on a length of web material.

[0048] FIG. 18 is a top plan view of a triangular rigid or semi-rigid portion of an embodiment of the package of the present disclosure, thereby allowing for improved pouring from the package in some instances.

[0049] FIG. 19A is a perspective view of a header of an embodiment of the package of the present disclosure, wherein the zipper extends only partially across the top of the header.

[0050] FIG. 19B is a perspective view of a header of an embodiment of the package of the present disclosure, wherein a shortened zipper is provided across a portion of the top of the header.

[0051] FIG. 20 is a plan view of a header of an embodiment of the package of the present disclosure, showing the zipper providing access to a pour spout.

[0052] FIG. 21A is a diagram of embodiment of the package of the present disclosure, wherein the package is filled between the container and the web of the header material.

[0053] FIG. 21B is a diagram of an embodiment of the package of the present disclosure, wherein the package is filled between the zipper and the header.

[0054] FIG. 21C is a diagram of an embodiment of the package of the present disclosure, wherein the package is filled between the zipper profiles.

[0055] FIG. 22 is a diagram of several variations of an embodiment of the package of the present disclosure, wherein a straw aperture is formed in the header, the header is provided with a tear-away compartment with printed material, and wherein the side of the carton includes a reinforcing member.

[0056] FIG. 23 is a plan view of a header with a slider zipper and a tear-away portion.

[0057] FIG. 24 illustrates an embodiment of the package of the present disclosure with a cap placed over the top of the package.

[0058] FIG. 25 illustrates an embodiment of the package of the present disclosure with a reinforcing band placed around the package.

[0059] FIG. 26 illustrates an embodiment of the package of the present disclosure, which is free of gussets and includes a diagonally oriented zipper spanning opposing corners of the container portion.

[0060] FIGS. 27A-27I illustrate various zipper and web material cross sections which may be used in embodiments of the present disclosure.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0061] Referring now to the drawings in detail wherein like numerals indicate like elements throughout the several views, one sees that FIG. 1 is a perspective view of an embodiment

of the package 10 of the present disclosure. Package 10 includes a rigid, semi-rigid or fibrous carton-type container 12, typically with a central layer 164 (FIG. 3B) made from a paper product such as fiberboard or chipboard and an interior surface 166 with an oxygen barrier and a moisture barrier and a poly-coated outer layer 162, but is not limited thereto (hereinafter, collectively referred to as a “semi-rigid container”). Semi-rigid container 12 is typically initially provided in a flat configuration as shown in FIG. 3A with an open top or mouth 14 and an open bottom 16. Package 10 further includes a plastic or polymeric header 18 (typically applied by heat, adhesive or glue) which includes first and second sidewalls 20, 22 and a reclosure (or closure) 24, illustrated as a zipper with first and second interlocking profiles 25, 27 (see FIG. 6B), but is not limited thereto. Other examples of reclosures include, but are not limited to, flanged zippers with opening lips, flanged tamper-resistant zippers, tamper-evident zippers, flanged zippers with sliders (see FIG. 23), flanged zippers without sliders, string (flangeless) zippers, double zippers (see FIG. 271), multiple track zippers, zippers with a tear line, a zipper with flanges connected above the locking elements, zippers with flanges connected below the locking elements, leak-resistant zippers, zippers with a peel seal, hinged zippers, zippers with spot seals, zippers with eyemarks, partly sealed zippers, zippers with shape-retaining characteristics, pinch grip pull zippers (i.e., lower product side opening strength than consumer side opening strength), zipper tape (especially for applications involving frozen foods), hook-and-eye (i.e., Velcro®), reclosable adhesives, perforated cap zipper tape, laminated zipper tape with a tear bead, zippers with a weakened line of resistance, zippers with a wedge, zippers with a stabilizing post, zippers with guide ribs, zippers with a compression post, and fitments. These terms are known to those skilled in the art, and the corresponding zippers are disclosed in patents incorporated by reference in their entirety hereinafter. Additionally, in some applications, a peel seal may be substituted for the reclosure. Similarly, examples of the web from which header 18 is manufactured includes, but are not limited to, film with eyemarks, printed film (see FIG. 22), film with cut-outs, film with diagonal seals and film with tear-lines. The header 18 is sealed or glued to the mouth 14 of semi-rigid container 12. First and second cross-seals 21, 23 or other methods of attachment are formed at the ends of header 18 between the sidewalls 20, 22, immediately outwardly adjacent from first and second folded edges (or first and second exterior folds) 30, 32. The first and second cross-seals 21, 23 further typically include respective first and second side incisions or notches 31, 33 in order to remove material to aid in the subsequent folding of the header 18 into the position shown in FIG. 2. Other shapes, such as single or multiple radius cut-outs are also envisioned. It is noted that it is envisioned that some applications may fold the header 18 onto the top of the package 10. However, it will be preferred in many applications that the reclosure or zipper 24 not be bent 180 degrees. The header 18 may be made with biodegradable plastic. Additionally, in such an embodiment, the sealant for semi-rigid container 12 would also be made biodegradable.

[0062] As shown in FIG. 3A, semi-rigid container 12 is typically initially provided in a flat state with front panel 13 and rear panel 15. Semi-rigid container 12 is typically partially or fully poly-coated on exterior surface 162 (FIG. 3B), particularly in the areas where heat sealing is required, such as the top of semi-rigid container 12 where header 18 is

attached, and the portions of semi-rigid container 12 where the bottom is sealed shut before or after filling. Alternately, adhesive is applied in the required areas and the attachment is done by these adhesives. Additionally, interior coating or lamination may include other materials required for the necessary barrier properties, including hermeticity and oxygen-moisture barriers. While illustrated in FIG. 3A (see FIG. 22), front and rear panels 13, 15 typically have printing including advertising and product information in text and graphics form on the exterior thereof, such as most products commonly found in a grocery store or other retail establishment. Front panel 13 and rear panel 15 are joined to each other by first and second folded edges 30, 32 which ultimately become the central folds of the first and second gusseted sides 34, 36 of semi-rigid container 12 in the expanded or filled configuration as shown in FIGS. 1 and 2. Front panel 13 of semi-rigid container 12 further includes first and second front interior vertical folds 38, 40 which are inwardly adjacent from and parallel to first and second folded edges 30, 32. In the expanded or filled configurations as shown in FIGS. 1 and 2, first and second front interior vertical folds 38, 40 form the transition from the front surface 42 to the gusseted sides 34, 36. Similar first and second rear interior vertical folds 38', 40' are formed on the rear of the semi-rigid container 12, see FIGS. 5A and 5B, forming the transition from the rear surface 43 to the gusseted sides 34, 36. As shown in FIG. 7, as well as FIG. 3A, the upper ends of vertical folds 38, 38', 40, 40' may terminate in chamfered sections 39, 39', 41, 41', respectively, in order to prevent cracking of the material of semi-rigid container 12 during folding and further to reduce the likelihood of the material of semi-rigid container 12 forming a point to puncture the material of header 18. Similarly, as shown in FIG. 7, in order to prevent leakage between header 18 (not shown in FIG. 7) and semi-rigid container 12, extra dots of glue (indicated as “G”) are provided at the top of first and second folded edges 30, 32 within first and second gusseted sides 34, 36. Additionally, as semi-rigid container 12 is typically formed from a single sheet of material with a seam 35 formed at the overlapping joinder of the edges (shown in FIG. 7 as occurring at second interior vertical fold 40) an extra dot of glue (indicated as “G”) is provided at the top of seam 35 in order to prevent leakage between the semi-rigid container 12 and the header 18 due to the transition in thickness caused by seam 35. Other embodiments may use an even number (four or greater) of panels.

[0063] Returning to FIG. 3A, one sees that first and second interior horizontal folds 46, 48 are formed on front panel 13 adjacent to the bottom 16. Similar first interior horizontal fold 46' is formed on the rear panel 15 of semi-rigid container 12, see FIGS. 5A, 5B. The first interior horizontal folds 46, 46' are used to form the transition to the bottom surface 50 while the second interior horizontal fold 48 is used to form the fin seal 52 as shown in FIGS. 4A, 4B, 5A and 5B. A second horizontal fold is not illustrated on the rear panel 15, as typically, only one of panels 13, 15 include a second horizontal fold in order to help force the fin seal 52 to fold in a specific direction. As shown in the area of detail of FIG. 3A, the lower portions of first and second front interior vertical folds 38, 40 form respective first and second inwardly inclined fold portions 139, 141. As shown in the area of detail of FIG. 3A, an angle of typically 1-4 degrees, or preferably 2-3 degrees in most applications, is formed between the projection of respective front interior vertical folds 38, 40 (with substantially identical construction on the rear of semi-rigid container 12) and

inwardly inclined fold portions **139**, **141**, so that the inwardly inclined fold portions **139**, **141** incline or veer toward the center of the semi-rigid container **12** as the inwardly inclined fold portions **139**, **141** approach the open bottom **16**. This aids in the subsequent folding of the semi-rigid container **12** into the package **10**.

**[0064]** As further shown in FIG. 3A, corresponding first and second oval-shaped partially scored portions **47**, **49** (typically cutting through a first layer of a multi-laminate or coated surface, however other similar methods, such as compressing, are considered to be within the definition of scoring) are formed with a vertical major axis on semi-rigid container **12** immediately below header **18**, outwardly adjacent from first and second front interior vertical folds **38**, **40** (thereby being located within the gusseted sides after the package **10** has been formed). During the formation of the package **10** from the semi-rigid container **12** and header **18**, corresponding first and second oval-shaped dots of glue **51**, **53** (with a horizontal major axis) are placed on one side of front of header **18**, typically above reclosure or zipper **24** and inwardly adjacent from respective first and second cross-seals **21**, **23**. Additionally, a dot of glue **55** may be placed just below the mid-point of the top edge of header **18**. Typically, hot melt glue is used, but other glues or adhesives may be applicable to various applications. During formation of the package **10** from the semi-rigid container **12** and header **18**, the header **18** is folded down against the sides of the formed semi-rigid container **12** so that first and second oval-shaped dots of glue **51**, **53** cover and are glued or otherwise secured to respective first and second oval-shaped partially scored portions **47**, **49**. Similarly, dot of glue **55** tacks the top edge of header **18** against the folded-down sidewall **20**. Thereafter, when the user lifts the header **18** so as to break the connection formed by first and second oval-shaped dots of glue **51**, **53**, typically only the relatively well-defined first and second oval-shaped partially scored portions **47**, **49** are torn from the semi-rigid container **12**, with little or no unsightly fiber tears. First and second oval-shaped partially scored portion **47**, **49** are typically provided only on the front of semi-rigid container **12**. Otherwise, the front and rear views of semi-rigid container **12** are substantially identical. Alternately, releasable configurations may be used to attach the folded header to the sides of the formed semi-rigid container, such as, but not limited to, releasable adhesives, hook-and-eye (Velcro®), multiple strips, etc.

**[0065]** First diagonal fold **54** extends from the intersection of first interior vertical fold **38** and first horizontal fold **46** to the intersection of first folded edge **30** and second horizontal fold **48**. Similarly, second diagonal fold **56** extends from the intersection of second interior vertical fold **40** and first horizontal fold **46** to the intersection of second folded edge **32** and second horizontal fold **48**. Additionally, as shown in FIG. 3A, the lower corners are removed by first and second lower cuts **57**, **59** which extend diagonally from the respective ends of second horizontal fold **48** to opposite ends of the bottom **16** of the semi-rigid container **12**. This results in diagonal ends on fin seal **52** as shown in FIG. 4A. As shown in FIGS. 4B, 5B and 6B, similar first and second diagonal folds **54'**, **56'** are formed on the rear panel **15** of semi-rigid container **12**. The first and second diagonal folds **54**, **54'**, **56**, **56'** are necessary for forming the diagonal edges of first and second lower triangular ears **58**, **60**, shown in the transitory extended position in FIGS. 4A, 4B, 5A, 5B and shown in the final sealed flush position in FIGS. 1, 2, 6A and 6B.

**[0066]** FIGS. 6E and 6F illustrate a further embodiment of package **10**, wherein first and second sidewalls **20**, **22** may be provided as two separate sheets or a single sheet, and wherein seal **119** either joins the two separate sheets or is formed in a central location on the single sheet. Sidewall **20** includes a line of weakness **72** (which may include perforations, laser scored lines, tear beads, tear notches, linear tear lines, a peel seal, or similar structures, and may be configured as multiple lines) with first and second flanges **25'**, **27'** of zipper **24** extending over line of weakness **72** and sealed to first sidewall **20** on opposite sides of line of weakness **72**. Zipper **24** further includes an opening zipper flange **123** extending therefrom. In this position, the zipper **24** is placed on the front of the header **18**, in an off-central rather than central position. A similar alternative embodiment would attach the zipper **24** on the interior of first side wall **20**.

**[0067]** FIGS. 6G and 6H illustrate a still further embodiment of package **10** wherein the sidewalls **20**, **22** are provided as separate sheets (or alternately, as a single sheet with an opening or tear line therethrough) and flanged zipper **24** with slider **70** is sealed to the exterior thereof (first flange **25'** sealed to sidewall **20** and a second flange **27'** sealed to sidewall **22**) thereby allowing the consumer to operate the slider **70** to open the zipper **24** and thereby gain access to the contents of the package **10**.

**[0068]** FIGS. 8A-14 illustrate methods and apparatus for producing the packages **10** of FIGS. 1-7. FIGS. 8A-G and 9A-C illustrate methods and apparatus for producing the unfilled flat packages of FIG. 3A. In FIG. 8A (with many similar elements shown in the subsequent figures), a stack **11** of pre-made or previously made folded semi-rigid containers **12** is provided to a sequential feeder **290** (other sequential feeding apparatus, such as an upstream conveyor or pick-and-place apparatus, may be substituted for the stack **11** and sequential feeder **290**), and the semi-rigid containers **12** are fed sequentially in a machine direction by a servo-driven conveyor **103**. Web material **102** is provided from a spool **100**, with periodic eyemarks **104** (in some applications, cut-outs in the web material could be substituted for eyemarks), the detection of which by eye-mark detector **111** is used to time the sequential feeding of semi-rigid containers **112** by sequential feeder **290** to conveyor **103** (the registration provided by the eyemarks **104** and the detection thereof is typically only required if the web material **102** has graphics or other printing with defined locations for the beginning and end of adjacent headers, see FIG. 22). Alternatively, the detection of the periodic eyemarks **104** can be used to vary the speed of the conveyor **103** so that the semi-rigid containers are delivered with the correct registration with respect to the web material **102**. Length of zipper material **202** is provided from spool **200** and is sealed to length of web material **102** at sealing and folding station **106** (length of zipper material **202** may be configured without sliders, with pre-mounted sliders, or with sliders mounted by optional slider mounting station **204** shortly after the zipper is provided from spool **200** or mounting station **204'** can be located after the zipper material is attached to the web material as shown in FIG. 8A). This sealing may be done by attaching a first flange of an interlocked zipper material **202** to unfolded web material **102** and then attaching the second flange after the web material **102** is folded around the zipper material **202**. Alternately, the separate, unlocked profiles of zipper material **202** may be attached to the web material **102** and the web material **102** thereafter folded so that the profiles of zipper material **202** are aligned

and interlocked (see the alternative embodiment illustrated in phantom in FIG. 8B). In another alternative, the interlocked zipper material 202 may be introduced between a folded web material 102 and then sealed or attached thereto. In yet another embodiment of the method, the zipper is attached to separate web materials. In such an embodiment, the zipper is either attached to one web in an unlocked condition, one section to each web, and thereafter, the zipper is aligned and interlocked or one side of an interlocked zipper material can be attached to one web material. Then the other web material can be attached to the other side of the zipper material. In these embodiments, the zipper can be separated at a later stage for filling the semi-rigid container through the zipper. Additionally, while the preferred method of attaching together the zipper, web, and semi-rigid containers requires several steps, this may be done in fewer steps or even simultaneously.

[0069] Typically, releasable dots of glue (other similar methods may be used) are applied to the length of web material at glue station 107 for the purpose of attaching the header 18 to the outside of formed semi-rigid container 12. At web sealing (or attaching) station 108, the length of web 102 (with the zipper 202 attached thereto) is folded (the lateral edges of which thereby form first and second sidewalls 20, 22 of header 18 of FIGS. 1-6) so as to contact semi-rigid containers 12. The lateral edges of web material 102 are glued, sealed or otherwise fastened to front and rear panels 13, 15 of semi-rigid container 12 by web sealing or attaching station 108. Sealing station 108 typically includes compression rollers and a heated bar on both sides of the web. The sealing station may include multiple heated seal bars, wherein the semi-rigid container 12, with the header 18 in position, passes through these heated bars with little to no contact pressure. After each set of seal bars, the container 12 and header 18 pass through compression rollers. The compression rollers set the film-to-film seal (i.e., cross-seals 21, 23) between the semi-rigid containers 12 and the film-to-container seal over the containers 12. These compression rollers can be free-spinning or driven. Additionally, it has been found that by pre-tensioning the film of header 18 during sealing, that the package 10 becomes more rigid. The semi-rigid containers 12 with the web material 102 attached (with the zipper material 202, in turn, attached to web material 102) move in the machine direction. A cross-sealer 110 with typically three cross-seal bars 112, 114, 116 (see FIG. 11) reciprocates so that it momentarily travels in the machine direction, tracking the movement of the semi-rigid containers 12 and the web material 102 (with zipper material 202 attached thereto), and engages the web material 102 so that a first cross-seal 21 and adjoining second cross-seal 23 of an adjacent package are simultaneously formed in three successive inter-package gaps, typically without the necessity of slowing or stopping the travel of web material 102. The use of multiple cross-seal bars (typically ultrasonic, but may include heat welding) along with the synchronized travel with the web material 102 allows for a prolonged dwell time, thereby improving sealing qualities, while maintaining high production rates. In some embodiments, a lesser or greater number of cross-seal bars may be implemented. The cross-sealer 110 then travels in the opposite direction from the machine direction to position itself for the cross-sealing operation with the successive or consecutive three inter-package gaps. The cross-seal bars 112, 114, 116 typically include a reverse knurled ultrasonic horn and a reverse knurled ultrasonic anvil as shown in FIG.

10. The reverse knurled surface creates a multitude of small pockets for the polymeric or similar material to flow during the sealing or welding of the cross-seals 21, 23. This produces high quality and aesthetically appealing cross-seals in half the time of heat and pressure sealing. It also typically removes the ambient heat that damages film during long machine stops. FIGS. 8A-G and 9A-C illustrate method and apparatus of attaching zipper web material to the outside of folded semi-rigid containers 12. However, such zipper material can be attached to the inside of the semi-rigid containers 12. In such an embodiment, the edges 30, 32 of gussets 34, 36 are slit a required distance, and the zipper web material is introduced between the separated upper portions of gussets 34, 36 and attached thereto and to panels 13, 15. Alternatively, as shown in FIG. 6D, panels 13, 15 (as well as gussets 34, 36) are provided with upwardly facing flaps 13', 15' between and to the inside of which zipper web material forming header 18 is attached as in FIG. 3C.

[0070] The web material 102 in the inter-package gaps is then severed by cutting station 120, resulting in the flat and unfilled packages 10 of FIG. 3A. Alternately, in lieu of cutting, perforations can be made in the cross-seals by station 120, thereby leaving the packages in a concatenated chain.

[0071] FIG. 8B shows a similar method and apparatus, wherein no eyemarks are provided on the web material 102 (typically because no graphics are provided on the web material 102 which would require critical registration) and wherein the conveyor 103 is a servo-driven chain with periodically spaced adjustable lugs 105 for engaging the trailing edges of semi-rigid containers 12 thereby assuring accurate spacing of the semi-rigid containers 12. Further illustrated in FIG. 8B, in phantom, is a second source of zipper material 200B, wherein source 200 would include a first interlockable profile and source 200B would include a second interlockable profile. The separate, unlocked profiles of zipper material 202 may be attached to the web material 102 and the web material 102 thereafter folded so that the profiles of zipper material 202 are aligned and interlocked.

[0072] As shown in FIG. 8C, another alternative is to provide two separate sheets of web 102A, 102B. Zipper profiles 202A, 202B are supplied from respective spools 200A, 200B and sealed to sheets of web 102A, 102B by sealing stations 106A, 106B. The zipper profiles 202A and 202B are then aligned and joined together and the top edges of the sheet web 102A, 102B sealed together at a joining and sealing station 109. However, if at a later stage, the then-formed container is to be filled through the zipper, the top edges 102A and 102B are left unsealed.

[0073] As shown in FIG. 8D, another alternative is to feed two sheets of web 102A, 102B and interlocked zipper 202 to sealing station 106 wherein a first profile of zipper 202 is sealed to web 102A and a second profile is sealed to web 102B simultaneously or at a later station. Again, however, if at a later stage, the then-formed container is to be filled through the zipper, the top edges 102A, 102B are left unsealed. The top edges of sheets of web 102A, 102B are then sealed together at sealing station 109. FIG. 27H is a representative cross section of what may be produced by this method and apparatus, showing, in particular, lines of weakness 72 or similar opening structure (which may include perforations, laser scored lines, tear beads, tear notches, linear tear lines, a peel seal, or similar structures, and may be configured as multiple lines) formed in sidewalls 20, 22 thereby providing access to zipper 24 after removal of removable header portion

29. Further illustrated in FIG. 27H is pocket 133 formed between seals 135, 137 that can hold printed advertising or similar material 138 therein. This structure is likewise illustrated in FIG. 22.

[0074] As shown in FIG. 8E, segments of zipper material, resulting in discrete zippers 24, may be fed to the length of web material 102 by zipper feeder 206 as shown in FIG. 17B resulting in a spaced-apart configuration. This may avoid having the zipper profile in cross-seals 21, 23, but requires accurate registration of the zippers 24 with respect to the web material 102. In this embodiment, the zipper segments may be applied to web material 102 in line with the web direction or at an angle to it.

[0075] As shown in FIGS. 8F and 8G, stack 11 is implemented as a magazine with containers 12 stacked vertically therein. Sequential feeder 290 is implemented as a conveyor belt. Conveyor belt 290 pulls a single container 12 through a feed gate which allows only the thickness of one box to pass through. Containers 12 are then engaged in a nip formed between upper and lower conveyor pull belts 292, 294. The upper and lower conveyor pull belts 292, 294 are typically set at a speed different than that of the conveyor belt 290 in order to control the gap between successive containers 12. The edge of containers 12 is sensed by electric eye 296 which controls the operation of glue dot applicator 502 (similar to that shown in FIG. 9C) which applies glue dots to the containers 12.

[0076] FIGS. 9A and 9B disclose methods and apparatus similar to those of FIGS. 8A and 8B, except that web material 102 is supplied with the length of zipper material 202 already sealed thereto. If the web material 102 is provided in a folded state, then folding within the illustrated apparatus is not required.

[0077] FIG. 9C discloses a method and apparatus wherein the length of web material 102 is supplied with the length of zipper 202 already attached thereto. The length of web material 102 is fed in open configuration at a right angle (i.e., perpendicularly) to the direction of travel of the semi-rigid containers 12. The length of web material 102 (with zipper 202 attached) is then brought into alignment with the direction of travel of semi-rigid containers by roller 500. Glue spots are applied by applicator 502 and guiding rollers 504, 506, 508 fold the web material 102 over the succession of semi-rigid containers 12.

[0078] Typically, the resulting header 18 comprises web reclosure material, wherein the distance between the edges of the header 18, when spread apart, is greater than the distance between the edges of the sides of the semi-rigid container 12 when the semi-rigid container 12 is unfolded and formed (i.e., the distance between first and second front interior vertical folds 38, 40).

[0079] FIGS. 27A-27I illustrate various embodiments or variations of the zipper 24, including profiles 25, 27, with respect to their attachment to front and rear sidewalls 20, 22 of web material 102, as well as different configurations of web material 102 as in FIGS. 27E and 27F. It should be noted that FIGS. 27A, 27E and 27F relate to constructions where the zipper is attached to the outside of the folded web material (also see FIGS. 6E and 6G). As stated previously, many different kinds of zippers can be used, such as hinged zippers, slider zippers, flangeless (string) zippers and any of the zippers disclosed in U.S. Pat. No. 6,360,513 entitled "Resealable Bag for Filling with Food Product(s) and Method", to Strand et al.; U.S. Pat. No. 7,137,736 entitled "Closure Device for a Reclosable Pouch" to Pawloski; U.S. Pat. No. 5,972,396

entitled "Flexible Package Having a Reclosable Zipper" to Jurgovan; U.S. Pat. No. 6,030,122 entitled "Pinch-Grip Zipper" to Ramsey; U.S. Pat. No. 6,347,885 entitled "Reclosable Package Having Zipper Closure, Slider Device and Tamper-Evident Structure" to Buchman; U.S. Pat. No. 6,427,421 entitled "Method of Manufacturing Recloseable Packages" to Belmont; U.S. Pat. No. 4,846,585 entitled "Easy Open Bag Structure" to Boeckmann; U.S. Pat. No. 4,874,257 entitled "Method of Forming a Closed Filled Bag, a Bag Construction and an Apparatus for Forming the Bag" to Inagaki; U.S. Pat. No. 6,299,353 entitled "Zipper for Reclosable Container with Apertures Passing Through Female Profile" to Piechocki; U.S. Pat. No. 6,955,465 entitled "Powder-Resistant Flexible Zipper For Reclosable Packaging" to Machacek; U.S. Pat. No. 7,241,046 entitled "Watertight Closure for a Reclosable Package" to Piechocki; U.S. Pat. No. 6,609,827 entitled "Bag Having Slider-Actuated Complementary Closure Strips and a Leakproofing Structure" to Bois et al.; U.S. Pat. No. 3,325,084 entitled "Pressure Closable Fastener" to Ausnit; U.S. Pat. No. Re. 34,554 entitled "Bags with Reclosable Plastic Fastener Having Automatic Sealing Gasket Means" to Ausnit; U.S. Pat. No. 5,520,463 entitled "Foamed Zipper" to Tilman; U.S. Pat. No. 4,787,880 entitled "Method of Making Extruded Zipper Strips and Bags Containing the Same" to Ausnit; U.S. Pat. No. 6,177,172 entitled "Zippered Film and Bag" to Yeager; U.S. Pat. No. 6,021,557 entitled "Process of Making a Zipper for a Reclosable Thermoplastic Bag" to Dais et al.; U.S. Pat. No. 7,478,950 entitled "Variable Alignment Slider Zipper for Reclosable Bags" to Flourde et al.; U.S. Pat. No. 4,925,316 entitled "Reclosable Bag Having an Outer Reclosable Zipper Type Closure and Inner Non-Reclosable Closure" to Van Erden et al.; U.S. Pat. No. 4,923,309 entitled "Tamper-Evident Package" to Van Erden; U.S. Pat. No. 5,509,734 entitled "Wedge Activated Zipper" to Ausnit; U.S. Pat. No. 4,736,451 entitled "Extruded Zipper Having Combination Stabilizing and Differential Opening Means" to Ausnit; U.S. Pat. No. 5,412,924 entitled "Method of Making Reclosable Plastic Bags on a Form, Fill and Seal Machine" to Ausnit; U.S. Pat. No. 3,959,856 entitled "Interlocking Separable Fastener" to Ausnit; U.S. Pat. No. 6,131,370 entitled "Zipper Applied Across a Film in Transverse Direction" to Ausnit; U.S. Pat. No. 6,863,754 entitled "Apparatus and Method for Manufacturing Reclosable Bags Utilizing Zipper Tape Material" to Wright et al.; U.S. Pat. No. 6,290,392 entitled "Reclosable Plastic Bag with Deformable, Stay-Open Inlay" to Sandor; U.S. Pat. No. 3,054,434 entitled "Bag Closure" to Ausnit; U.S. Pat. No. 4,665,552 entitled "Zipper Equipped Bags and Method of and Means for Manually Filling and Separating Them" to Lems et al.; U.S. Pat. No. 5,902,427 entitled "Fastener Arrangement with Dual Purpose Cover Sheet" to Zinke et al.; U.S. Pat. No. 5,174,658 entitled "Self-Expanding and Reclosable Flexible Pouch" to Cook et al.; U.S. Pat. No. 6,827,491 entitled "Wide Open Feature for Reclosable Bags" to Kohl et al.; U.S. Pat. No. 6,899,460 entitled "Storage Bag with Openly Biased Mouth" to Turvey et al.; and U.S. Pat. No. 6,167,597 entitled "High Compression Zipper" to Malin, the contents of all of which are hereby incorporated by reference in their entirety.

[0080] A typical bottom filling method and apparatus is shown in FIG. 12. It is important to note that the filling apparatus and machinery shown in FIG. 12 may be geographically or otherwise spatially separated from the package forming machinery of FIGS. 8A-G and 9A-C. The forming and filling operations may take place at separate times and

places, at the same time and place. The forming and filling apparatus and machinery may be on separate manufacturing lines or on an integrated manufacturing line. The package of FIG. 3A (resulting from the method and apparatus of one of FIGS. 8A-G and FIGS. 9A-C) is inverted. Former 300 opens up the package 10 so that first and second interior vertical folds 38, 38', 40, 40' become the corners of the semi-rigid container 12, and a product volume is created within the semi-rigid container 12. This typically includes applying opposing forces on the semi-rigid container 12 near cross seals 21, 23 as illustrated by the arrows labeled "F" on the far left of FIG. 12. At first sealer 302 (alternatively characterized as a releasable attacher), as explained with respect to FIG. 3A, first and second oval-shaped dots of glue 51, 53 are placed on one side of front of header 18 and the header 18 is folded so that first and second oval-shaped dots of glue 51, 53 cover and are glued or otherwise secured to respective first and second oval-shaped partially scored portions 47, 49. Mandrel 303, which may be reciprocating, may be used in combination with first sealer 302 to assure a square shape of the semi-rigid container 12 and further to assure reliable gluing by dots 51, 53. Alternately, other methods of attaching header 18 to the sides of the formed semi-rigid container 12 may be used as previously described. Thereafter, inverted package 10 is filled from filler 304. First folder 306 folds along first and second interior horizontal folds 46, 46', 48 and seals to form fin seal 52 and triangular ears 58, 60 as shown in FIGS. 4A and 4B. First folder 306 may be implemented as an inverted configuration of the band sealer 310 shown in FIGS. 13 and 14. Polytetrafluoroethylene belts 312, 313 grip the material of the fin seal 52 and heated seal bars 314, 315 perform the sealing operation between the front and rear panels 13, 15 thereby completing the fin seal 52. First folder 306 may also utilize adhesive for closing the bottom of the package 10. Second folder 308 folds the fin seal 52 flush to the package 10 and seals the fin seal 52 to the package 10. Third folder 309 seals triangular ears 58, 60 to the bottom of the package 10 (shown in solid) or to the first and second gusseted sides 34, 36 of semi-rigid container 12 (shown in phantom). It may be preferred that the triangular ears 58, 60 be sealed to the bottom of the package 10 for aesthetic purposes and to reduce the possibility of the consumer opening the bottom of the package 10. The semi-rigid container 12 may have different bottom folding sections and different ways of folding these sections. In alternative embodiments, the packages 10 are filled at a later stage, or are maintained in a continuous chain with perforated lines attaching the cross seals between adjacent packages 10 and stacked in a zig-zag configuration. In another alternative, the semi-rigid container 12 is not inverted. After the bottom of the container is formed, the semi-rigid container 12 is filled through the top as described hereinafter with respect to FIGS. 21A-C.

[0081] FIG. 15A illustrates, in phantom, two possible positions of an optional handle 62 or 62'. One handle 62 may be sealed or otherwise formed on the side of header 18. Alternatively, a handle 62' may be sealed or otherwise formed on front panel 13 of package 10.

[0082] FIG. 15B illustrates, in perspective, an extended header 18 with an aperture 63 therethrough, thereby forming a handle.

[0083] FIG. 16 illustrates an embodiment of header 18 wherein the fold between the first and second sidewalls 20, 22 of header 18 includes a line of weakness 72 (which may include perforations, laser scored lines, tear beads, tear

notches, linear tear films, or similar structures, and may be configured as multiple lines) in place of, or in conjunction with, closure 24. Similarly, element 72 may be implemented as a linear tear line. This provides for a header 18 which can be opened by the consumer, but not reclosed. Similarly, FIG. 17A illustrates an embodiment of header 18 wherein sidewalls 20, 22 are provided as separate pieces with a peel seal 64 (typically pre-activated) therebetween. Element 64 could likewise be implemented as a tear tape or a pinch-grip zipper. [0084] FIG. 18 illustrates a cross-section of an embodiment of semi-rigid container 12 wherein front and rear panels 13, 15 are joined at one end by first gusseted side 34 and directly joined to each other at the other end at point 36' thereby eliminating second gusseted side 36 and providing a triangular cross section which may be advantageous for pouring.

[0085] FIG. 19A illustrates an embodiment of a header 18 wherein first and second sidewalls 20, 22 are sealed or otherwise joined to each other along a portion 66 of the top edge, with a zipper 24, including first and second profiles 25, 27, providing a reclosure along the remainder of the top edge. Typically, portion 66 is formed by sealing together a section of the zipper or the cross-seal 23 is extended across the header 18, leaving only a small section open for pouring out the contents. Similarly, FIG. 19B illustrates an embodiment of header 18 wherein a shortened zipper segment 24', configured as a fitment, is inserted into the seal 66 between first and second sidewalls 20, 22 in a configuration adapted to locking after pouring of contents.

[0086] FIG. 20 illustrates an embodiment of header 18 including a funnel portion 67 created by forming diagonal seals and cut-outs to the double folded zipper film. Access to the funnel portion 67 is provided by zipper 24. The funnel portion 67 would be extended through header 18 for dispensing product therefrom.

[0087] FIG. 21A illustrates an embodiment with top-filling, wherein, first sidewall 20 of header 18 is sealed, glued or attached to the semi-rigid container 12. Prior to the sealing, gluing, or other attachment of second sidewall 22 of header 18 to semi-rigid container 12, filling apparatus 400 inserts the contents into the package. Thereafter, the second sidewall 22 is attached or sealed back to semi-rigid container 12 by sealer 402. Alternately, as shown in FIG. 21B, a zipper flange 27' can be left unattached from its corresponding sidewall 22 and the product is filled by filler between the flange 27' and the sidewall 22. Thereafter, the flange 27' and the sidewall 22 are attached together by sealer 402. In a further alternative embodiment shown in FIG. 21C, the top of the film of header 18 is slit, the zipper (or reclosure) 24 is opened, product is filled through zipper 24 by filler 400, the zipper 24 is reclosed and the slit edges of header 18 are resealed by sealer 402. However, if separate sheets of web material are used as in FIG. 8C, there is no need to slit the top of header 18.

[0088] FIG. 22 illustrates an embodiment of package 10 wherein a straw-aperture 68 in header 18, typically initially being sealed but providing an easy opening for the consumer. FIG. 22 additionally illustrates the structure of the removable header portion 29 illustrated in FIG. 27H. Further illustrated in FIG. 22 is the attachment of a rigid support member 153 to the side of second gusseted side 36, as well as the header structure illustrated and described with respect to FIG. 27H. Additionally illustrated on FIG. 22 is printing on the header and printing on the carton.

[0089] FIG. 23 illustrates an embodiment of header 18 wherein reclosure 24 is implemented as a flanged zipper with



a slider **70**. Additionally, the walls of header **18** include a tear line **72** (typically implemented as a line of weakness, such as perforations, laser scored lines, tear beads, tear notches, linear tear films, or similar structures, and may be configured as multiple lines) which is above the reclosure **24** in the first and second cross seals **21**, **23**, descending to the area between the top of reclosure **24** and the seal lines **74** joining the zipper flanges and the walls of header **18**. Slider **70** operates in the conventional way, opening the zipper when moved in a first direction and closing the zipper when moved in a second direction, opposite to the first direction.

**[0090]** FIG. **24** illustrates an embodiment wherein header **18** is held in place by a cap **80**. Cap **80** includes rectangular top **82** with side walls **84** extending downwardly therefrom. The rectangular shape of cap **80** aids not only in strengthening or reinforcing the package **10**, but also helps the package **18** retain a rectangular cross section. Similarly, FIG. **25** illustrates an embodiment of package **10** with band **86** holding down the header **18**. As previously described with respect to FIG. **22**, the gusseted sides **35** or **36** may be provided with rigid support member **153**. Top **82** and band **86** may be breakably attached to semi-rigid container **12**, thereby providing tamper evidence, if removed.

**[0091]** FIG. **26** illustrates an embodiment of package **10** with a rectangular semi-rigid container **12** which has four sides **90**, **91**, **92**, **93** thereby forming a square or rectangular shape which is free of gussets. The header **18** is glued, sealed or otherwise attached to flattened semi-rigid container **12** by methods previously described so that cross-seal **21** is aligned with the corner or fold formed between sides **90**, **93** and cross-seal **23** is aligned with the corner or fold formed between sides **91**, **92** (formed oppositely from the corner formed by sides **90**, **93**). This configuration allows the semi-rigid container **12**, with the header **18** attached, to lie flat prior to filling (that is, sidewalls **90** and **93** are pressed or folded flat against each other and sidewalls **91**, **92** are pressed or folded flat against each other), similar to the previously described embodiments, however without requiring gussets. In the open configuration, as shown in FIG. **26**, the zipper **24** extends diagonally across the open top of the semi-rigid container. Similar configurations could be achieved with packages with an even number of sides, greater than four.

**[0092]** Thus the several aforementioned objects and advantages are most effectively attained. Although preferred embodiments of the invention have been disclosed and described in detail herein, it should be understood that this invention is in no sense limited thereby and its scope is to be determined by that of the appended claims.

**1-28.** (canceled)

**29.** A container portion for a carton, comprising:

a front portion and a rear portion;

first and second edges formed by respective first and second exterior folds joining the front portion to the rear portion thereby forming an open top and an open bottom;

the front portion including a first front interior vertical fold inwardly adjacent from the first edge and a second front interior vertical fold inwardly adjacent from and parallel to the second edge;

the rear portion including a first rear interior vertical fold inwardly adjacent from the first edge and a second rear interior vertical fold inwardly adjacent from and parallel to the second edge;

the front and rear portions including respective front and rear horizontal folds upwardly adjacent from the open bottom; and

a first glue dot adjacent to a top of the first edge and a second glue dot adjacent to a top of the second edge.

**30.** The container portion of claim **29** wherein the front portion and rear portion are made from a single sheet of material, wherein edges of the sheet of material are joined at a seam and further including a third glue dot at a top of the seam.

**31.** The container portion of claim **29** further including a header attached to and covering the top, the header including a closure.

**32.** The container portion of claim **31** wherein the header is formed of polymeric material.

**33.** The container portion of claim **32** wherein the closure is a zipper.

**34.** The container portion of claim **33** wherein the zipper is tamper-evident.

**35.** A container portion for a carton, comprising:

a front portion and a rear portion;

first and second edges formed by respective first and second exterior folds joining the front portion to the rear portion thereby forming a top and a bottom;

the front portion including a first front interior vertical fold inwardly adjacent from the first edge and a second front interior vertical fold inwardly adjacent from and parallel to the second edge;

the rear portion including a first rear interior vertical fold inwardly adjacent from the first edge and a second rear interior vertical fold inwardly adjacent from and parallel to the second edge;

the front and rear portions including respective first front and rear horizontal folds upwardly adjacent from the bottom;

one of the front portion and the rear portion including a second horizontal fold between the first front or rear horizontal fold and the bottom; and

wherein the container portion is subsequently folded so that first and second front and rear interior vertical folds become corners of a package, first and second edges become central folds of first and second gusseted sides, portions of the container portion between the second horizontal fold and the bottom becomes a fin seal of a package, and portions of the container portion below the first front and rear horizontal folds become a closed bottom of a package.

**36.** The container portion of claim **34** further including a header attached to and covering the top, the header including a closure.

**37.** The container portion of claim **36** wherein the header is formed of polymeric material.

**38.** The container portion of claim **37** wherein the closure is a zipper.

**39.** The container portion of claim **38** wherein the zipper is tamper-evident.

**40.** The container portion of claim **29** further including a first front inclined fold portion extending from the first front interior vertical fold to the bottom; and a second front inclined fold portion extending from the second front interior vertical fold to the bottom.

**41.** The container portion of claim **40** wherein an angle between a projection of the first and second front interior



vertical folds and the respective first and second front inclined fold portions is in the range of 1-4 degrees.

**42.** The container portion of claim **40** wherein an angle between a projection of the first and second front interior vertical folds and the respective first and second front inclined fold portions is in the range of 2-3 degrees.

**43.** The container portion of claim **40**, further including:  
a first rear inclined fold portion extending from the first rear interior vertical fold to the bottom; and  
a second rear inclined fold portion extending from the second rear interior vertical fold to the bottom.

**44.** The container portion of claim **43** wherein an angle between a projection of the first and second rear interior vertical folds and the respective first and second rear inclined fold portions is in the range of 1-4 degrees.

**45.** The container portion of claim **43** wherein an angle between a projection of the first and second rear interior vertical folds and the respective first and second rear inclined fold portions is in the range of 2-3 degrees.

**46.** The container portion of claim **35** further including a first front inclined fold portion extending from the first front interior vertical fold to the bottom; and a second front inclined fold portion extending from the second front interior vertical fold to the bottom.

**47.** The container portion of claim **46** wherein an angle between a projection of the first and second front interior vertical folds and the respective first and second front inclined fold portions is in the range of 1-4 degrees.

**48.** The container portion of claim **46** wherein an angle between a projection of the first and second front interior vertical folds and the respective first and second front inclined fold portions is in the range of 2-3 degrees.

**49.** The container portion of claim **46**, further including:  
a first rear inclined fold portion extending from the first rear interior vertical fold to the bottom; and

a second rear inclined fold portion extending from the second rear interior vertical fold to the bottom.

**50.** The container portion of claim **49** wherein an angle between a projection of the first and second rear interior vertical folds and the respective first and second rear inclined fold portions is in the range of 1-4 degrees.

**51.** The container portion of claim **49** wherein an angle between a projection of the first and second rear interior vertical folds and the respective first and second rear inclined fold portions is in the range of 2-3 degrees.

\* \* \* \* \*