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[Continued on next page]

(54) Title: CARTON WITH PLASTIC RECLOSABLE HEADER

(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.

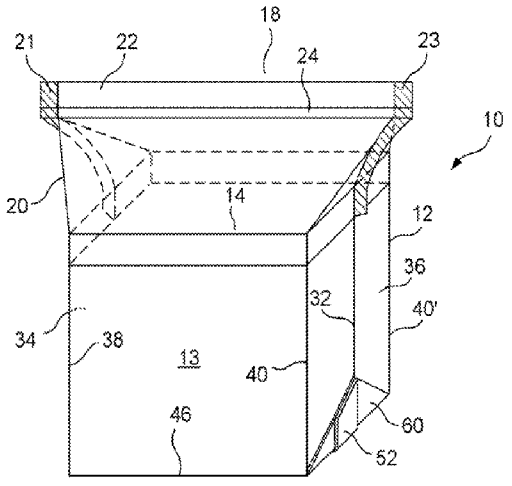


FIG. 1

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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 serial number 61/249,852, filed on October 8, 2009 and provisional patent application serial number 61/298,429, filed January 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. Patent No. 7,524,111 entitled "Rigid-Bottomed Resealable Bag with Handles", issued on April 28, 2009 to Williams; U.S. Patent No. 7,207,716 entitled "Flexible Container Having Flat Walls", issued on April 24, 2007 to Buchanan; U.S. Patent No. 7,160,029 entitled "Enclosure for Resealing a Package and Method Therefor", issued on January 9, 2007 to Bein; U.S. Patent No. 6,908,422 entitled "Reclosable Packaging Bag and Method for Manufacturing Same", issued on June 21, 2005 to Ichikawa et al.; U.S. Patent No. 6,110,512 entitled "Package and Merchandiser", issued on August 29, 2000 to Teasdale; U.S. Patent 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. Patent No. 4,691,373 entitled "Zipper Closure with Unitary Adhesive Cover Sheet", issued on September 1, 1987 to Ausnit; and U.S. Published Patent Application No. 2005/0194386, entitled "Zipper Box Covers" published on September 8, 2005 for Shai; and Japanese Patent No. 2002104511 entitled "Bag-in-Carton", published on April 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:

[00010] Figure 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.

[00011] Figure 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.

[00012] Figure 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.

[00013] Figure 3B is a cross-sectional view of typical material used for the rigid or semi-rigid container portion of embodiments of the present disclosure.

[00014] Figure 3C is a perspective view showing the header attached to the interior of the container portion of the package.

[00015] Figure 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.

[00016] Figure 4B is a plan view from above of the embodiment of the inverted package of Figure 4A.

[00017] Figure 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.

[00018] Figure 5B is a plan view from above of the embodiment of the inverted package of Figure 5A.

[00019] Figure 6A is a plan view of an embodiment of an inverted package of the present disclosure, similar to Figure 1, showing the ears of the bottom folded against the sides of the package and sealed thereto, typically after bottom filling.

[00020] Figure 6B is a side plan view of the embodiment of the inverted package of Figure 5A.

[00021] Figure 6C is a bottom view of an embodiment of the package, shown with the ears folded and sealed to the bottom of the package.

[00022] Figure 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.

[00023] Figure 6E is a side view of a further embodiment of the package of the present disclosure.

[00024] Figure 6F is a perspective view showing the embodiment of the package of Figure 6E, with a folded header.

[00025] Figure 6G is a side view of a still further embodiment of the package of the present disclosure.

[00026] Figure 6H is a perspective view showing the embodiment of the package of Figure 6G, with a folded header.

[00027] Figure 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.

[00028] Figure 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.

[00029] Figure 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.

[00030] Figure 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.

[00031] Figure 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.

[00032] Figure 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.

[00033] Figure 8F is a schematic of view of a sixth embodiment of a method and apparatus for producing the package of the present disclosure prior to filling.

[00034] Figure 8G is a side view of the sixth embodiment (see Figure 8F) of a method and apparatus for producing the package of the present disclosure prior to filling.

[00035] Figure 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.

[00036] Figure 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.

[00037] Figure 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.

[00038] Figure 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.

[00039] Figure 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.

[00040] Figure 12 is a schematic of an embodiment of method and apparatus of the present disclosure for bottom filling and sealing the packages.

[00041] Figure 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.

[00042] Figure 14 is a side view of the band sealer of Figure 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.

[00043] Figure 15A is a plan view of an embodiment of the package of the present disclosure, showing two alternative handle positions.

[00044] Figure 15B is a perspective view of an embodiment of the package of the present disclosure, showing a handle built into the header.

[00045] Figure 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.

[00046] Figure 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.

[00047] Figure 17B is a plan view of discrete zipper segments on a length of web material.

[00048] Figure 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.

[00049] Figure 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.

[00050] Figure 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.

[00051] Figure 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.

[00052] Figure 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.

[00053] Figure 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.

[00054] Figure 21C is a diagram of an embodiment of the package of the present disclosure, wherein the package is filled between the zipper profiles.

[00055] Figure 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.

[00056] Figure 23 is a plan view of a header with a slider zipper and a tear-away portion.

[00057] Figure 24 illustrates an embodiment of the package of the present disclosure with a cap placed over the top of the package.

[00058] Figure 25 illustrates an embodiment of the package of the present disclosure with a reinforcing band placed around the package.

[00059] Figure 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.

[00060] Figures 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

[00061] Referring now to the drawings in detail wherein like numerals indicate like elements throughout the several views, one sees that Figure 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 (Figure 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 Figure 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 Figure 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 Figure 23), flanged zippers without sliders, string (flangeless) zippers, double zippers (see Figure 27I), 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 Figure 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 Figure 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 bio-degradable plastic. Additionally, in such an embodiment, the sealant for semi-rigid container 12 would also be made bio-degradable.

[00062] As shown in Figure 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 (Figure 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 Figure 3A (see Figure 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 Figures 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 Figures 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 Figures 5A and 5B, forming the transition from the rear surface 43 to the gusseted sides 34, 36. As shown in Figure 7, as well as Figure 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 Figure 7, in order to prevent leakage between header 18 (not shown in Figure 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 Figure 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.

[00063] Returning to Figure 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 Figures 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 Figures 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 Figure 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 Figure 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.

[00064] As further shown in Figure 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.

[00065] 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 Figure 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 Figure 4A. As shown in Figures 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 Figures 4A, 4B, 5A, 5B and shown in the final sealed flush position in Figures 1, 2, 6A and 6B.

[00066] Figures 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.

[00067] Figures 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.

[00068] Figures 8A-14 illustrate methods and apparatus for producing the packages 10 of Figures 1-7. Figures 8A-G and 9A-C illustrate methods and apparatus for producing the unfilled flat packages of Figure 3A. In Figure 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 Figure 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 Figure 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 Figure 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.

[00069] 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 Figures 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 Figure 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 Figure 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. Figures 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 Figure 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 Figure 3C.

[00070] 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 Figure 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.

[00071] Figure 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 Figure 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

[00072] As shown in Figure 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.

[00073] As shown in Figure 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. Figure 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 Figure 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 Figure 22.

[00074] As shown in Figure 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 Figure 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.

[00075] As shown in Figures 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 Figure 9C) which applies glue dots to the containers 12.

[00076] Figures 9A and 9B disclose methods and apparatus similar to those of Figures 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.

[00077] Figure 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.

[00078] 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).

[00079] Figures 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 Figures 27E and 27F. It should be noted that Figures 27A, 27E and 27F relate to constructions where the zipper is attached to the outside of the folded web material (also see Figures 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. Patent No. 6,360,513 entitled "Resealable Bag for Filling with Food Product(s) and Method", to Strand et al.; U.S. Patent No. 7,137,736 entitled "Closure Device for a Reclosable Pouch" to Pawloski; U.S. Patent No. 5,972,396 entitled "Flexible Package Having a Reclosable Zipper" to Jurgovan; U.S. Patent No. 6,030,122 entitled "Pinch-Grip Zipper" to Ramsey; U.S. Patent

No. 6,347,885 entitled "Reclosable Package Having Zipper Closure, Slider Device and Tamper-Evident Structure" to Buchman; U.S. Patent No. 6,427,421 entitled "Method of Manufacturing Recloseable Packages" to Belmont; U.S. Patent No. 4,846,585 entitled "Easy Open Bag Structure" to Boeckmann; U.S. Patent 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. Patent No. 6,299,353 entitled "Zipper for Reclosable Container with Apertures Passing Through Female Profile" to Piechocki; U.S. Patent No. 6,955,465 entitled "Powder-Resistant Flexible Zipper For Reclosable Packaging" to Machacek; U.S. Patent No. 7,241,046 entitled "Watertight Closure for a Reclosable Package" to Piechocki; U.S. Patent No. 6,609,827 entitled "Bag Having Slider-Actuated Complementary Closure Strips and a Leakproofing Structure" to Bois et al.; U.S. Patent No. 3,325,084 entitled "Pressure Closable Fastener" to Ausnit; U.S. Patent No. Re. 34,554 entitled "Bags with Reclosable Plastic Fastener Having Automatic Sealing Gasket Means" to Ausnit; U.S. Patent No. 5,520,463 entitled "Foamed Zipper" to Tilman; U.S. Patent No. 4,787,880 entitled "Method of Making Extruded Zipper Strips and Bags Containing the Same" to Ausnit; U.S. Patent No. 6,177,172 entitled "Zippered Film and Bag" to Yeager; U.S. Patent No. 6,021,557 entitled "Process of Making a Zipper for a Reclosable Thermoplastic Bag" to Dais et al.; U.S. Patent No. 7,478,950 entitled "Variable Alignment Slider Zipper for Reclosable Bags" to Plourde et al.; U.S. Patent 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. Patent No. 4,923,309 entitled "Tamper-Evident Package" to Van Erden; U.S. Patent No. 5,509,734 entitled "Wedge Activated Zipper" to Ausnit; U.S. Patent No. 4,736,451 entitled "Extruded Zipper Having Combination Stabilizing and Differential Opening Means" to Ausnit; U.S. Patent No. 5,412,924 entitled "Method of Making Reclosable Plastic Bags on a Form, Fill and Seal Machine" to Ausnit; U.S. Patent No. 3,959,856 entitled "Interlocking Separable Fastener" to Ausnit; U.S. Patent No. 6,131,370 entitled "Zipper Applied Across a Film in Transverse Direction" to Ausnit; U.S. Patent No. 6,863,754 entitled "Apparatus and Method for Manufacturing Reclosable Bags Utilizing Zipper Tape Material" to Wright et al.; U.S. Patent No. 6,290,392 entitled "Reclosable Plastic Bag with Deformable, Stay-Open Inlay" to Sandor; U.S. Patent No. 3,054,434 entitled "Bag Closure" to Ausnit; U.S. Patent 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. Patent No. 5,902,427 entitled "Fastener Arrangement with Dual Purpose Cover Sheet" to Zinke et al.; U.S. Patent No. 5,174,658

entitled "Self-Expanding and Reclosable Flexible Pouch" to Cook et al.; U.S. Patent No. 6,827,491 entitled "Wide Open Feature for Reclosable Bags" to Kohl et al.; U.S. Patent No. 6,899,460 entitled "Storage Bag with Openly Biased Mouth" to Turvey et al.; and U.S. Patent No. 6,167,597 entitled "High Compression Zipper" to Malin, the contents of all of which are hereby incorporated by reference in their entirety.

[00080] A typical bottom filling method and apparatus is shown in Figure 12. It is important to note that the filling apparatus and machinery shown in Figure 12 may be geographically or otherwise spatially separated from the package forming machinery of Figures 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 Figure 3A (resulting from the method and apparatus of one of Figures 8A-G and Figures 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 Figure 12. At first sealer 302 (alternatively characterized as a releasable attacher), as explained with respect to Figure 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 previous 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 Figure 4A and 4B. First folder 306 may be implemented as an inverted configuration of the band sealer 310 shown in Figures 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 Figures 21A-C.

[00081] Figure 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.

[00082] Figure 15B illustrates, in perspective, an extended header 18 with an aperture 63 therethrough, thereby forming a handle.

[00083] Figure 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, Figure 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.

[00084] Figure 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.

[00085] Figure 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, Figure 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.

[00086] Figure 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.

[00087] Figure 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 Figure 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 Figure 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 Figure 8C, there is no need to slit the top of header 18.

[00088] Figure 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. Figure 22 additionally illustrates the structure of the removable header portion 29 illustrated in Figure 27H. Further illustrated in Figure 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 Figure 27H. Additionally illustrated on Figure 22 is printing on the header and printing on the carton.

[00089] Figure 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.

[00090] Figure 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, Figure 25 illustrates an embodiment of package 10 with band 86 holding down the header 18. As previously described with respect to Figure 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.

[00091] Figure 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 Figure 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.

[00092] 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.

CLAIMS

What is Claimed is:

1. An apparatus for filling a package including a rigid or semi-rigid container portion and a polymeric header, including;

a former for opening the rigid or semi-rigid container portion in an inverted configuration thereby creating a volume for contents therein;

a filler for inserting contents through an open bottom of the inverted rigid or semi-rigid container portion;

a first folder for closing the bottom of the inverted rigid or semi-rigid container portion thereby forming a seal.

2. The apparatus of Claim 1 further including an attacher for releasably attaching ends of the header to sides of the rigid or semi-rigid container portion.

3. The apparatus of Claim 2 wherein the seal is a fin seal, and further including:

a second folder for folding the fin seal against the bottom of the inverted rigid or semi-rigid container portion; and

a third folder for folding and sealing portions of the bottom of the inverted rigid or semi-rigid container portion.

4. The apparatus of Claim 1 wherein the first sealer includes a mandrel for supporting the inverted package in an open configuration while the sealer releasably attaches ends of the header to sides of the rigid or semi-rigid container portion.

5. The apparatus of Claim 3 wherein the first folder further creates ears extending from the bottom of the inverted rigid or semi-rigid container portion.

6. The apparatus of Claim 5 wherein the third folder seals the ears against sides of the rigid or semi-rigid container portion.

7. The apparatus of Claim 5 wherein the third folder seals the ears against the bottom of the rigid or semi-rigid container portion.

8. The apparatus of Claim 5 wherein the first folder is a band sealer.

9. An apparatus for filling a package including a rigid or semi-rigid container portion and a polymeric header, including;

a former for opening the rigid or semi-rigid container portion thereby creating a volume for contents therein;

a first folder for closing the bottom of the rigid or semi-rigid container portion thereby forming a seal;

a filler for inserting contents through an opening between the rigid or semi-rigid container portion and the polymeric header; and

a sealer for sealing the opening between the rigid or semi-rigid container portion.

10. The apparatus of Claim 9 wherein the seal is a fin seal, and further including:

a second folder for folding the fin seal against the bottom of the rigid or semi-rigid container portion;

a third folder for folding and sealing portions of the bottom of the rigid or semi-rigid container portion.

11. The apparatus of Claim 10 wherein the first folder further creates ears extending from the bottom of the rigid or semi-rigid container portion.

12. The apparatus of Claim 11 wherein the third folder seals the ears against sides of the rigid or semi-rigid container portion.

13. The apparatus of Claim 11 wherein the third folder seals the ears against the bottom of the rigid or semi-rigid container portion.

14. An apparatus for filling a package including a rigid or semi-rigid container portion and a polymeric header, including;

a former for opening the rigid or semi-rigid container portion thereby creating a volume for contents therein;

a first folder for closing the bottom of the rigid or semi-rigid container portion thereby forming a seal;

a filler for inserting contents through an opening in the polymeric header; and

a sealer for sealing the opening in the polymeric header.

15. The apparatus of Claim 14 wherein the seal is a fin seal, and further including:

a second folder for folding the fin seal against the bottom of the rigid or semi-rigid container portion;

a third folder for folding and sealing portions of the bottom of the rigid or semi-rigid container portion.

16. The apparatus of Claim 15 wherein the first folder further creates ears extending from the bottom of the rigid or semi-rigid container portion.

17. The apparatus of Claim 16 wherein the third folder seals the ears against sides of the rigid or semi-rigid container portion.

18. The apparatus of Claim 16 wherein the third folder seals the ears against the bottom of the rigid or semi-rigid container portion.

19. A method for filling a package including a rigid or semi-rigid container portion and a polymeric header, including the steps of:

opening the rigid or semi-rigid container portion in an inverted configuration thereby creating a volume for contents therein;

inserting contents through an open bottom of the inverted rigid or semi-rigid container portion;

closing the bottom of the inverted rigid or semi-rigid container portion thereby forming a seal.

20. The method of Claim 19 further including the step of releasably attaching ends of the header to sides of the rigid or semi-rigid container portion.

21. The method of Claim 20 wherein the seal is a fin seal, and further including the steps of:

folding the fin seal against the bottom of the inverted rigid or semi-rigid container portion; and

sealing portions of the bottom of the inverted rigid or semi-rigid container portion.

22. The method of Claim 21 wherein the step of closing the bottom further creates ears extending from the bottom of the inverted rigid or semi-rigid container portion.

23. The method of Claim 22 further including the step of sealing the ears against sides of the rigid or semi-rigid container portion.

24. The method of Claim 22 further including the step of sealing the ears against the bottom of the rigid or semi-rigid container portion.

25. The method of Claim 21 wherein the step of closing the bottom is performed by a band sealer.

26. A method for filling a package including a rigid or semi-rigid container portion and a polymeric header, including the steps of;

opening the rigid or semi-rigid container portion thereby creating a volume for contents therein;

closing the bottom of the rigid or semi-rigid container portion thereby forming a seal;

inserting contents through an opening between the rigid or semi-rigid container portion and the polymeric header; and

sealing the opening between the rigid or semi-rigid container portion.

27. The method of Claim 26 wherein the seal is a fin seal, and further including the steps of:

folding the fin seal against the bottom of the rigid or semi-rigid container portion;

sealing portions of the bottom of the rigid or semi-rigid container portion.

28. The method of Claim 27 wherein the step of closing the bottom further creates ears extending from the bottom of the rigid or semi-rigid container portion.

29. The method of Claim 28 further including the step of sealing the ears against sides of the rigid or semi-rigid container portion.

30. The method of Claim 28 further including the step of sealing the ears against the bottom of the rigid or semi-rigid container portion.

31. A method for filling a package including a rigid or semi-rigid container portion and a polymeric header, including the steps of;

opening the rigid or semi-rigid container portion thereby creating a volume for contents therein;

closing the bottom of the rigid or semi-rigid container portion thereby forming a seal;

inserting contents through an opening in the polymeric header; and

sealing the opening in the polymeric header.

32. The method of Claim 31 wherein the seal is a fin seal, and further including the steps of:

folding the fin seal against the bottom of the rigid or semi-rigid container portion;

sealing portions of the bottom of the rigid or semi-rigid container portion.

33. The method of Claim 32 wherein the step of closing the bottom further creates ears extending from the bottom of the rigid or semi-rigid container portion.

34. The method of Claim 33 further including the step of sealing the ears against sides of the rigid or semi-rigid container portion.

35. The method of Claim 33 further including the step of sealing the ears against the bottom of the rigid or semi-rigid container portion.

36. An apparatus for forming and filling a package, including an apparatus for forming and an apparatus for filling, wherein:

the apparatus for forming including:

a source of flat, folded rigid or semi-rigid container portions;

a source of web material;

a source of reclosure material;

a device for attaching the web material, with the reclosure material attached thereto, to the top of the rigid or semi-rigid container portions thereby forming a header; and

a device for forming seals in the web material between adjacent container portions; and

the apparatus for filling including:

a former for opening the rigid or semi-rigid container portion in an inverted configuration thereby creating a volume for contents therein;

a filler for inserting contents through an open bottom of the inverted rigid or semi-rigid container portion;

a first folder for closing the bottom of the inverted rigid or semi-rigid container portion thereby forming a seal.

37. The apparatus of Claim 36 wherein the apparatus for filling further includes an attacher for releasably attaching ends of the header to sides of the rigid or semi-rigid container portion.

38. The apparatus of Claim 37 wherein the reclosure material is zipper material with first and second interlockable profiles.

39. The apparatus of Claim 38 wherein the zipper material is chosen from the group consisting of a flanged zipper free of sliders, a flanged zipper with a slider, a flanged zipper with opening lips, a flanged tamper-resistant zipper, a tamper-evident zipper, a string zipper, a double zipper, a multiple track zipper, a zipper with a tear line, a zipper with flanges connected above the locking elements, a zipper with flanges connected below the locking elements, a leak-resistant zipper, a zipper with a peel seal, a hinged zipper, a zipper with spot seals, a zipper with eyemarks, a partly sealed zipper, a zipper with shape-retaining characteristics, a pinch grip pull zipper, zipper tape, a perforated cap zipper tape, a zipper

with a weakened line of resistance, a zipper with a wedge, a zipper with a stabilizing post, a zipper with guide ribs, a zipper with a compression post, and a laminated zipper tape with a tear bead.

40. The apparatus of Claim 37 wherein the seal is a fin seal, and further including:

a second folder for folding the fin seal against the bottom of the inverted rigid or semi-rigid container portion; and

a third folder for folding and sealing portions of the bottom of the inverted rigid or semi-rigid container portion.

41. The apparatus of Claim 40 wherein the first sealer includes a mandrel for supporting the inverted package in an open configuration while the sealer releasably attaches ends of the header to sides of the rigid or semi-rigid container portion.

42. The apparatus of Claim 40 wherein the first folder further creates ears extending from the bottom of the inverted rigid or semi-rigid container portion.

43. The apparatus of Claim 42 wherein the third folder seals the ears against sides of the rigid or semi-rigid container portion.

44. The apparatus of Claim 42 wherein the third folder seals the ears against the bottom of the rigid or semi-rigid container portion.

45. The apparatus of Claim 36 wherein the apparatus for forming further includes a cutter for cutting the web material between successive rigid or semi-rigid container portions.

46. The apparatus of Claim 36 wherein the apparatus for filling and the apparatus for forming are joined to each other.

47. The apparatus of Claim 36 wherein the apparatus for filling and the apparatus for forming are not joined to each other.

48. The apparatus of Claim 36 wherein the apparatus for filling and the apparatus for forming are located in the same geographic location.

49. The apparatus of Claim 36 wherein the apparatus for filling and the apparatus for forming are located in different geographic locations.

50. The apparatus of Claim 36 wherein the apparatus for filling and the apparatus for forming operate simultaneously.

51. The apparatus of Claim 36 wherein the apparatus for filling and the apparatus for forming are able to operate independently.

52. A method for forming and filling a package, including steps for forming and steps for filling, wherein:

the steps for forming including:

providing a source of flat, folded rigid or semi-rigid container portions;

providing a source of web material;

providing a source of reclosure material; and

attaching the web material, with the reclosure material attached thereto, to the top of the rigid or semi-rigid container portions thereby forming a header;

forming seals in the web material between adjacent container portions; and

the steps for filling including:

opening the rigid or semi-rigid container portion in an inverted configuration thereby creating a volume for contents therein;

inserting contents through an open bottom of the inverted rigid or semi-rigid container portion;

closing the bottom of the inverted rigid or semi-rigid container portion thereby forming a seal.

53. The method of Claim 52 wherein the steps for filling further include the step of releasably attaching ends of the header to sides of the rigid or semi-rigid container portion.

54. The method of Claim 52 wherein the steps for forming further includes cutting the web material between successive rigid or semi-rigid container portions.

55. The method of Claim 52 wherein the steps for filling and the steps for forming are performed by an integral piece of apparatus.

56. The method of Claim 52 wherein the steps for filling and the steps for forming are performed by separate apparatus.

57. The method of Claim 52 wherein the steps for filling and the steps for forming are performed in the same geographic location.

58. The method of Claim 52 wherein the steps for filling and the steps for forming are performed in different geographic locations.

59. The method of Claim 52 wherein the steps for filling and the steps for forming are performed simultaneously.

60. The method of Claim 52 wherein the steps for filling and the steps for forming are able to be performed independently.

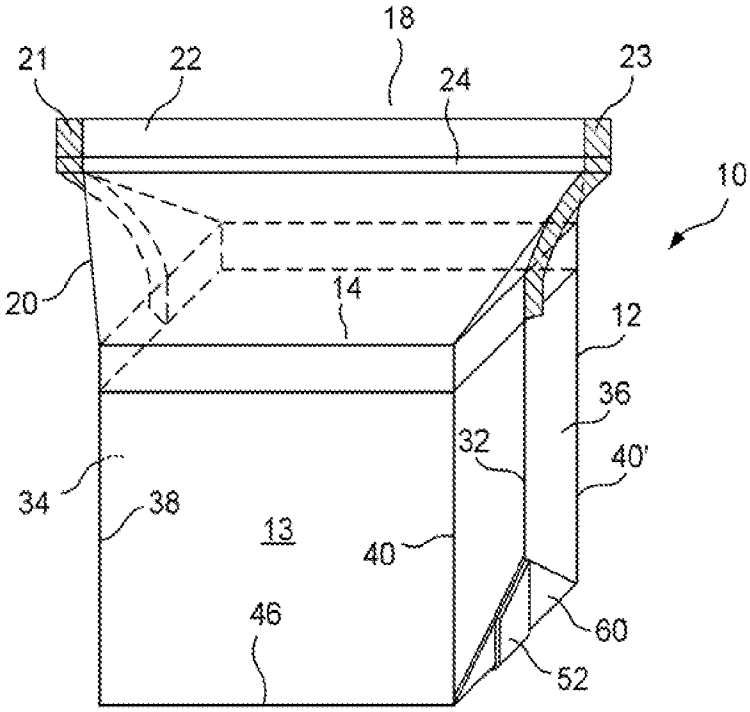

18
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14
12
36
32
40'
34
38
13
40
46
60
52

FIG. 1

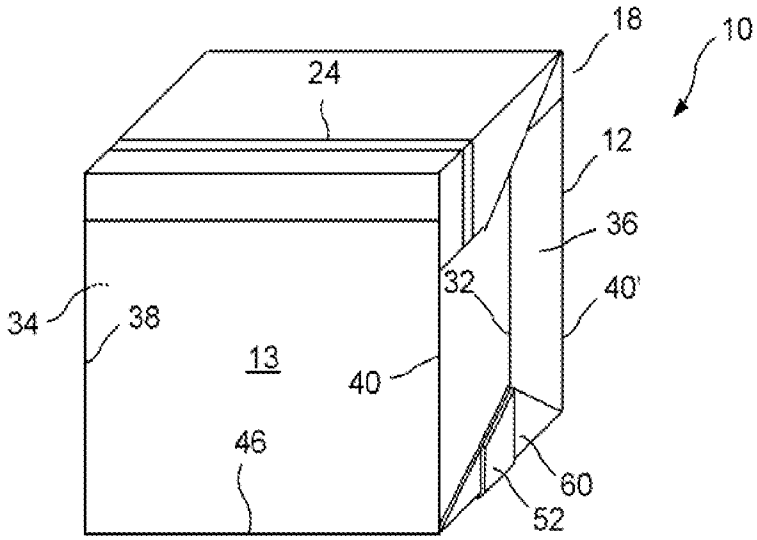

18
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40'
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FIG. 2

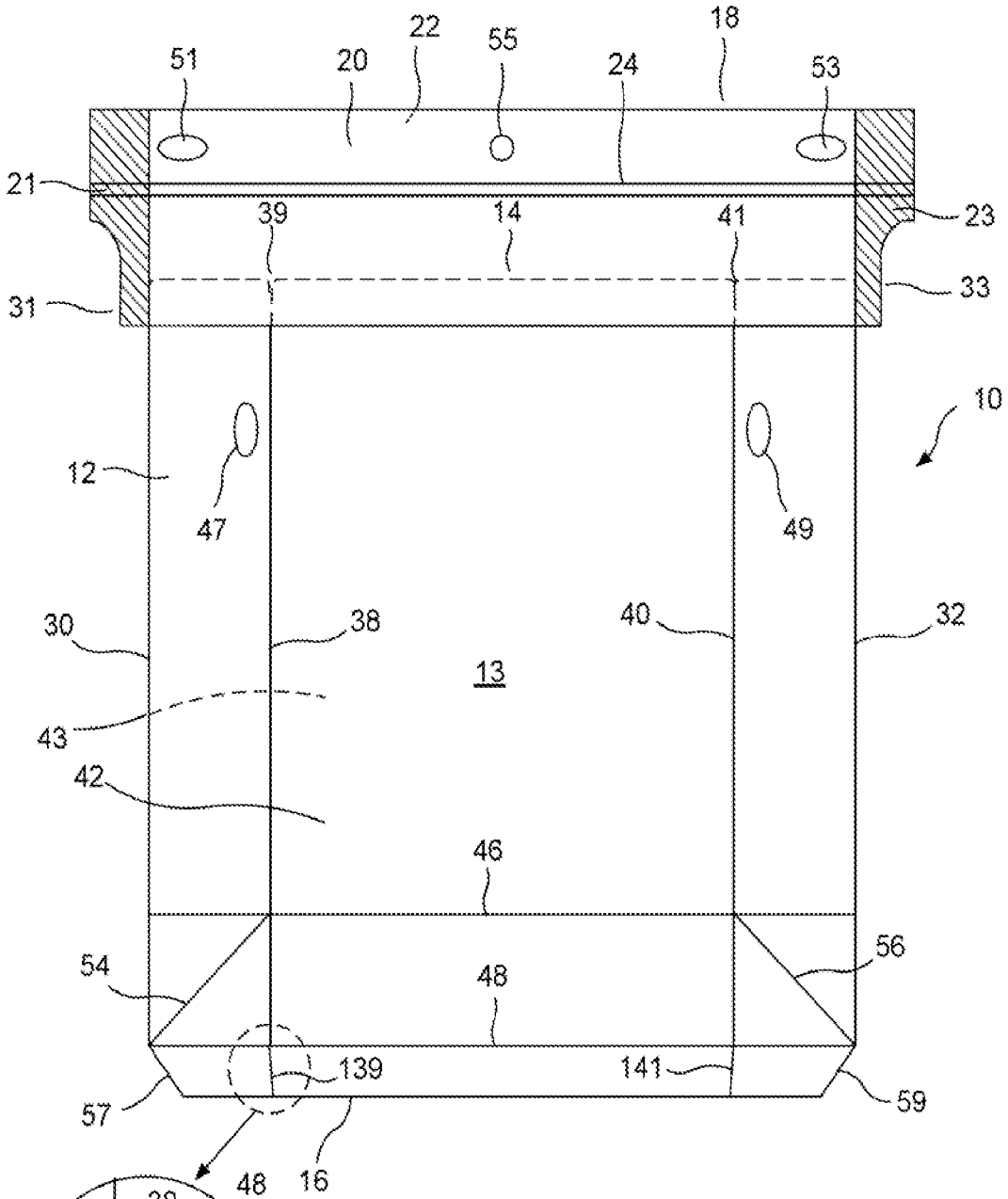
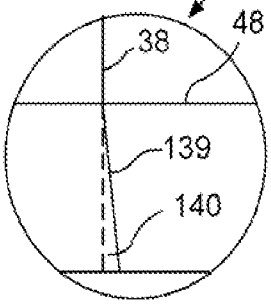


FIG. 3A



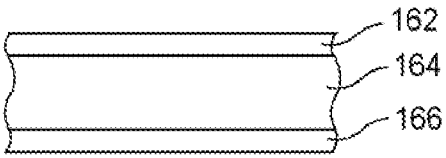


FIG. 3B

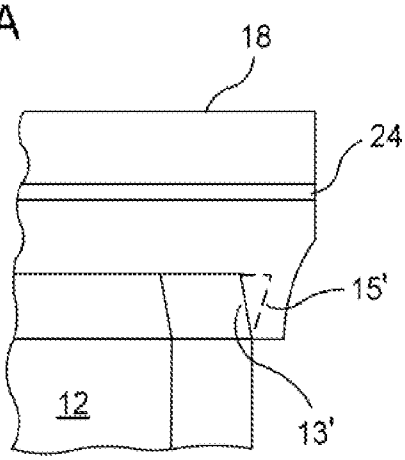


FIG. 3C

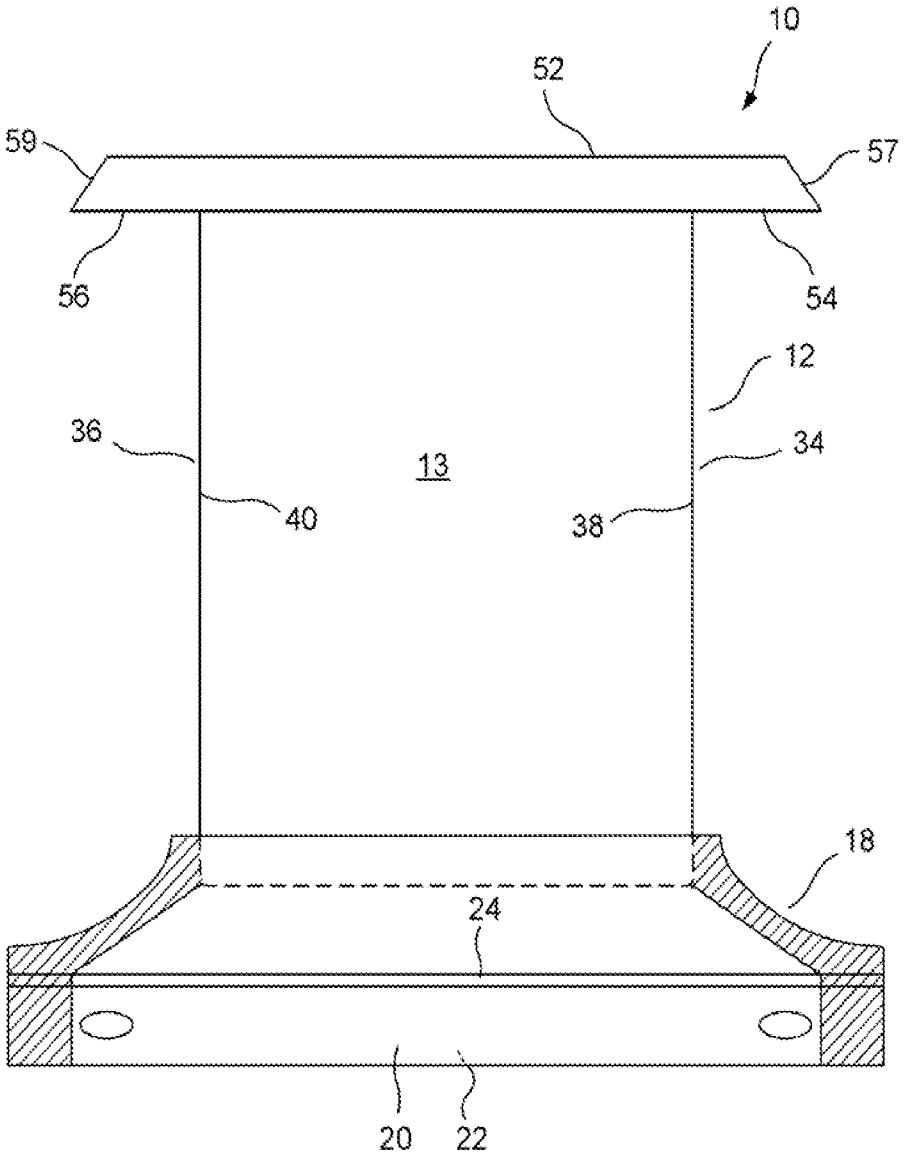

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FIG. 4A

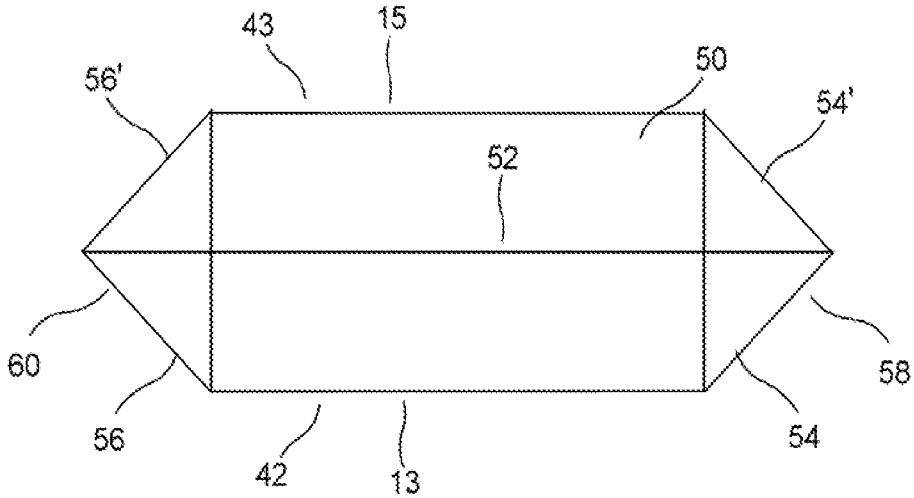

43
15
56'
50
54'
52
60
58
56
54
42
13

FIG. 4B

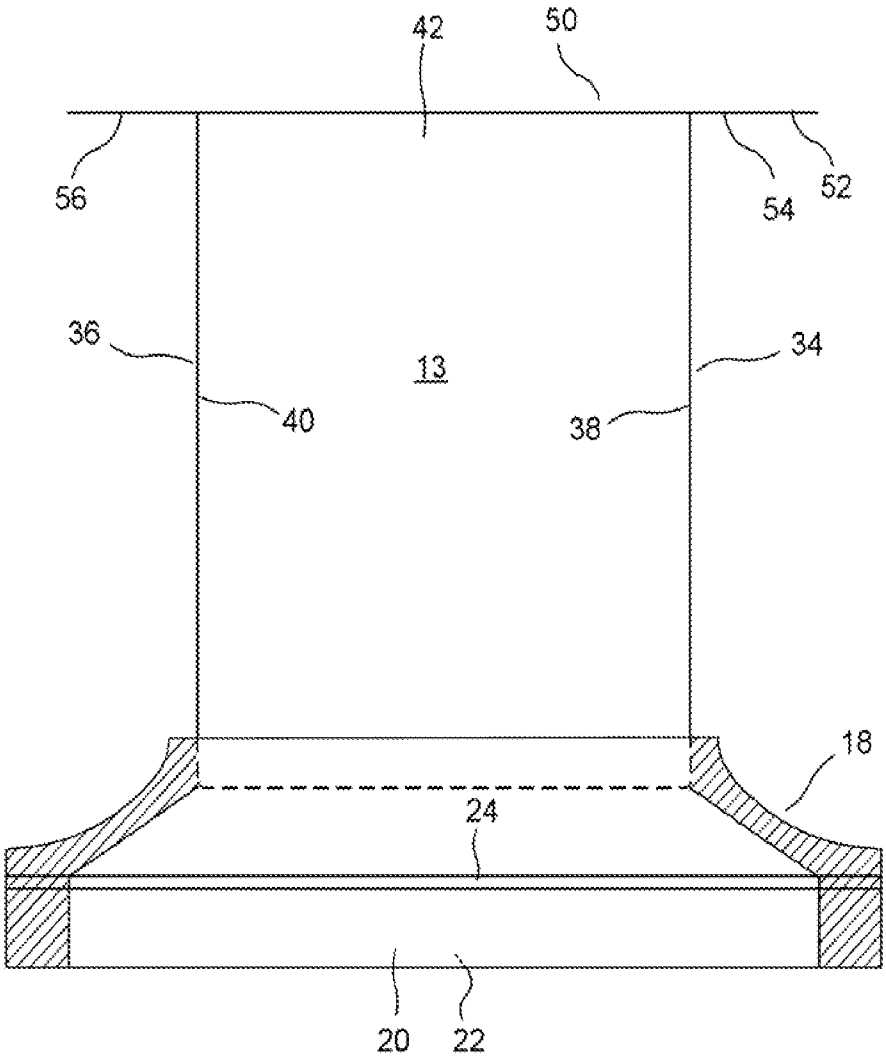

42
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22

FIG. 5A

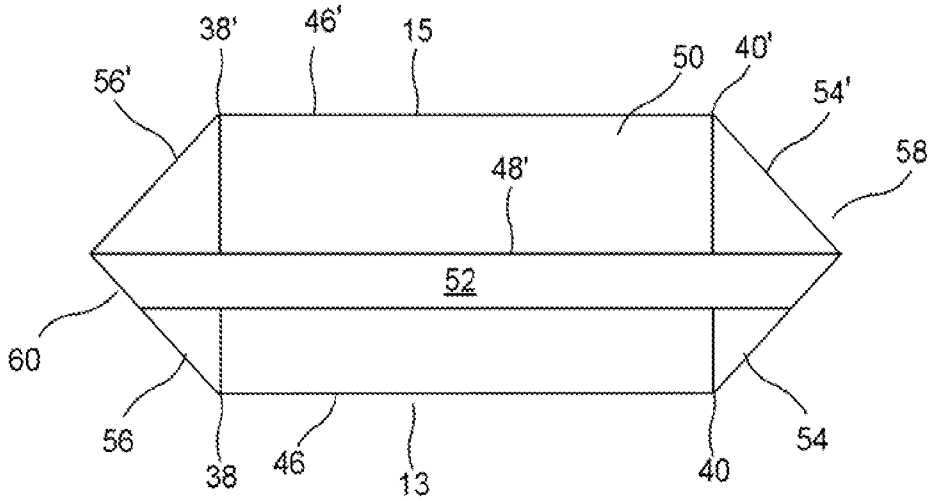

38'
46'
15
50
40'
56'
54'
58
48'
52
60
56
38
46
13
40
54

FIG. 5B

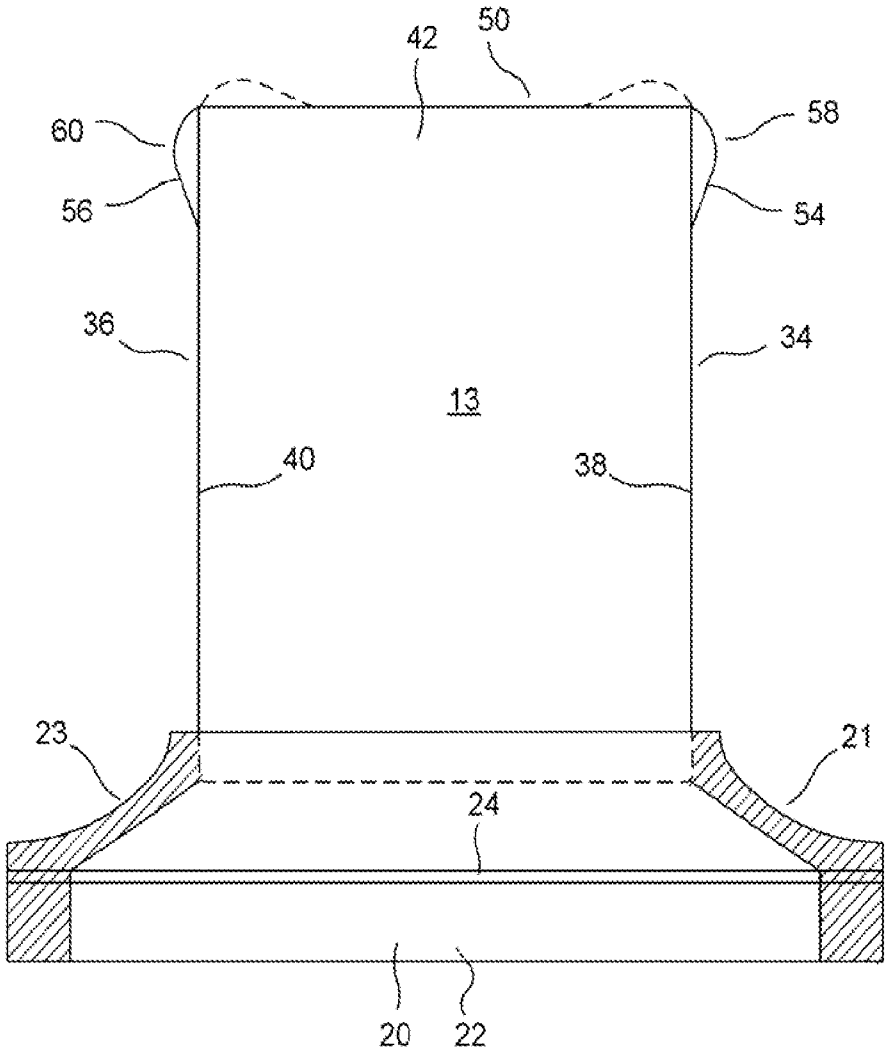

42
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60
58
56
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36
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24
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22

FIG. 6A

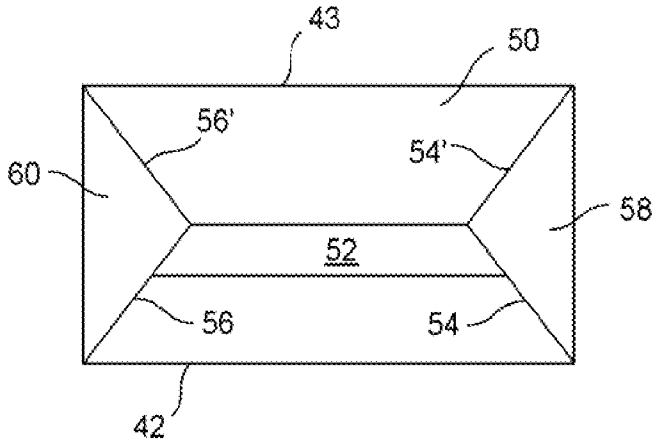

43
50
56'
54'
60
58
52
56
54
42

FIG. 6C

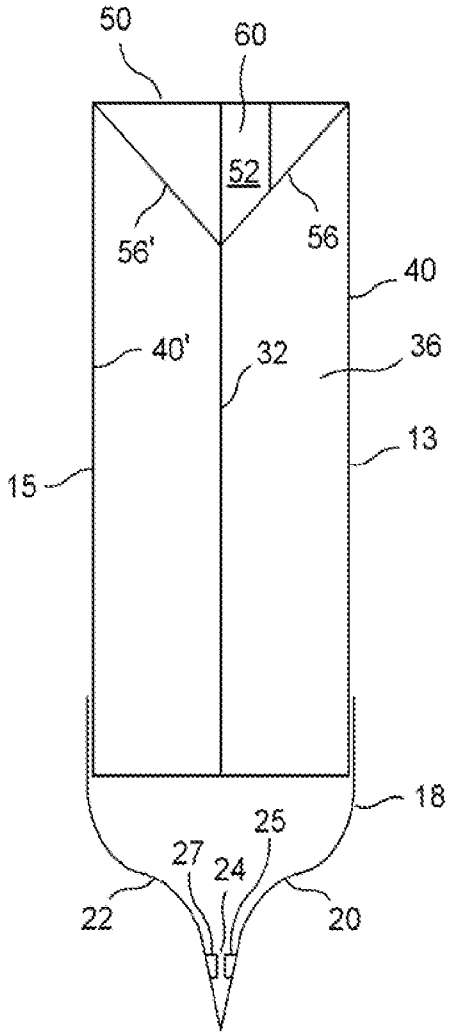

50
60
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56'
56
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40'
32
36
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27
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22
20

FIG. 6B

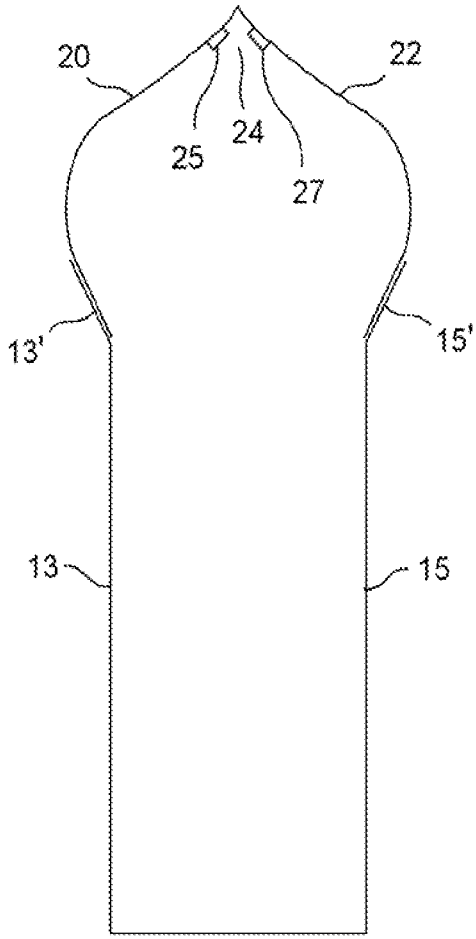

20
22
25
24
27
13'
15'
13
15

FIG. 6D

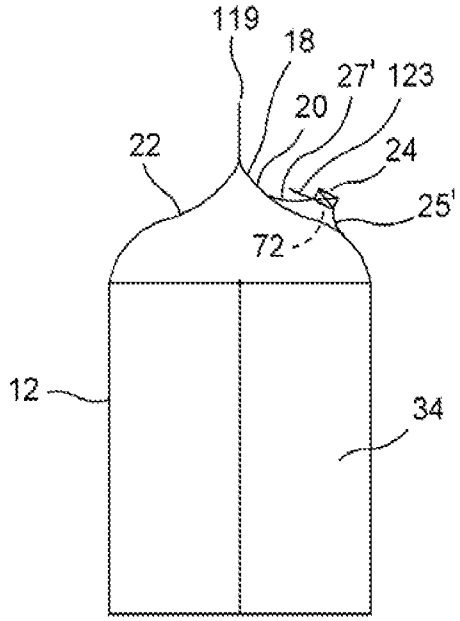


FIG. 6E

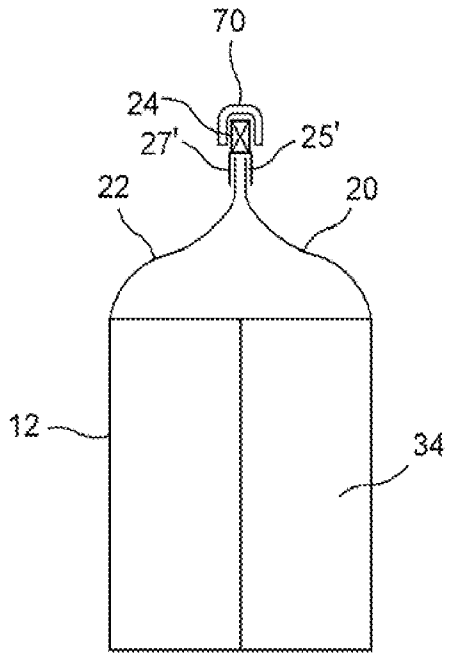


FIG. 6G

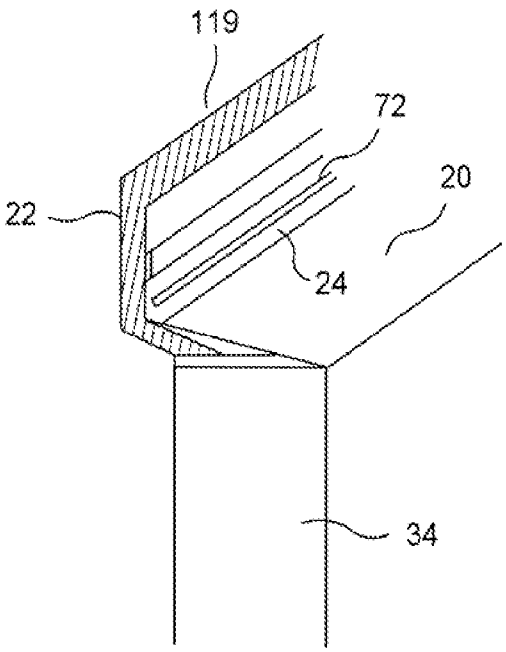


FIG. 6F

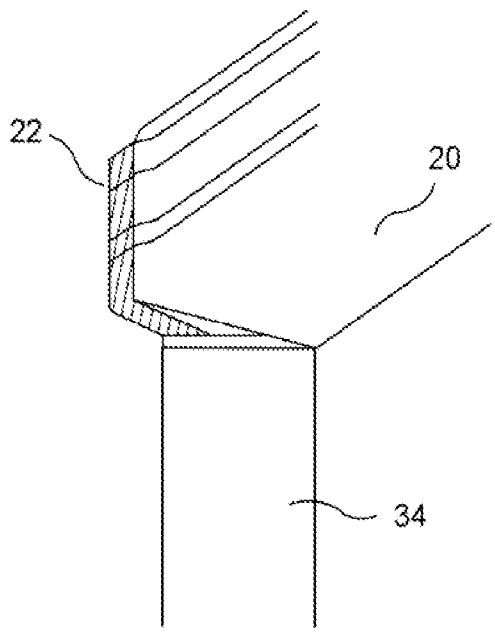


FIG. 6H

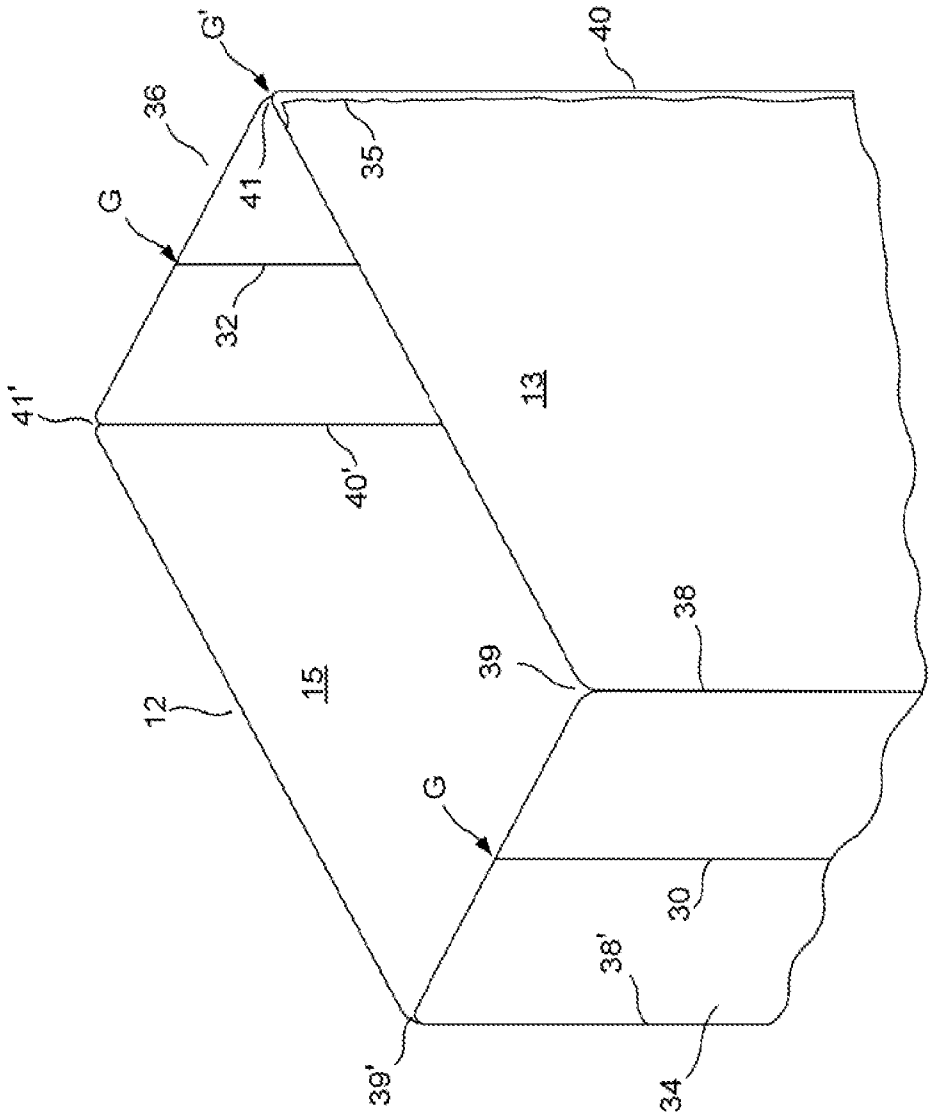


FIG. 7

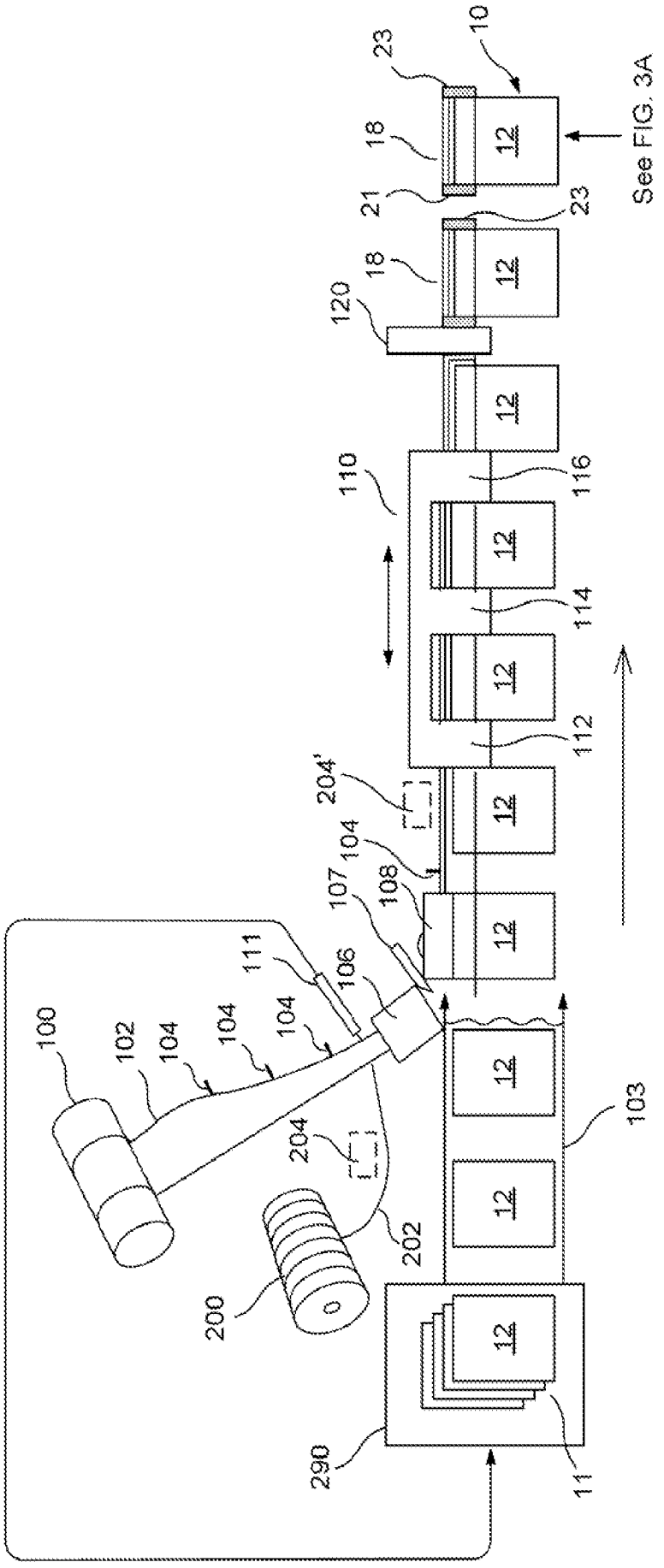

See FIG. 3A
10
23
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21
120
110
116
114
112
204'
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107
108
106
111
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204
202
200
103
290
11
12

FIG. 8A

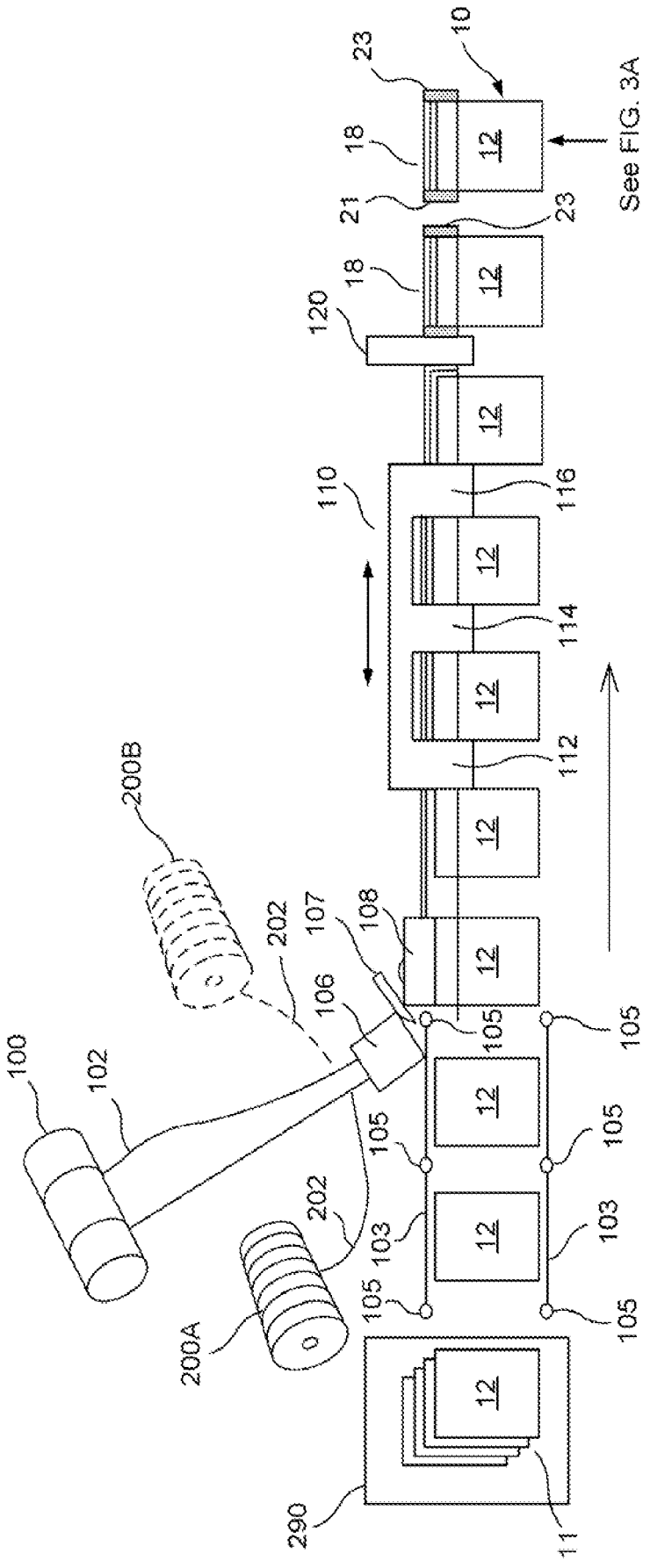

See FIG. 3A
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200B
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103
200A
290
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FIG. 8B

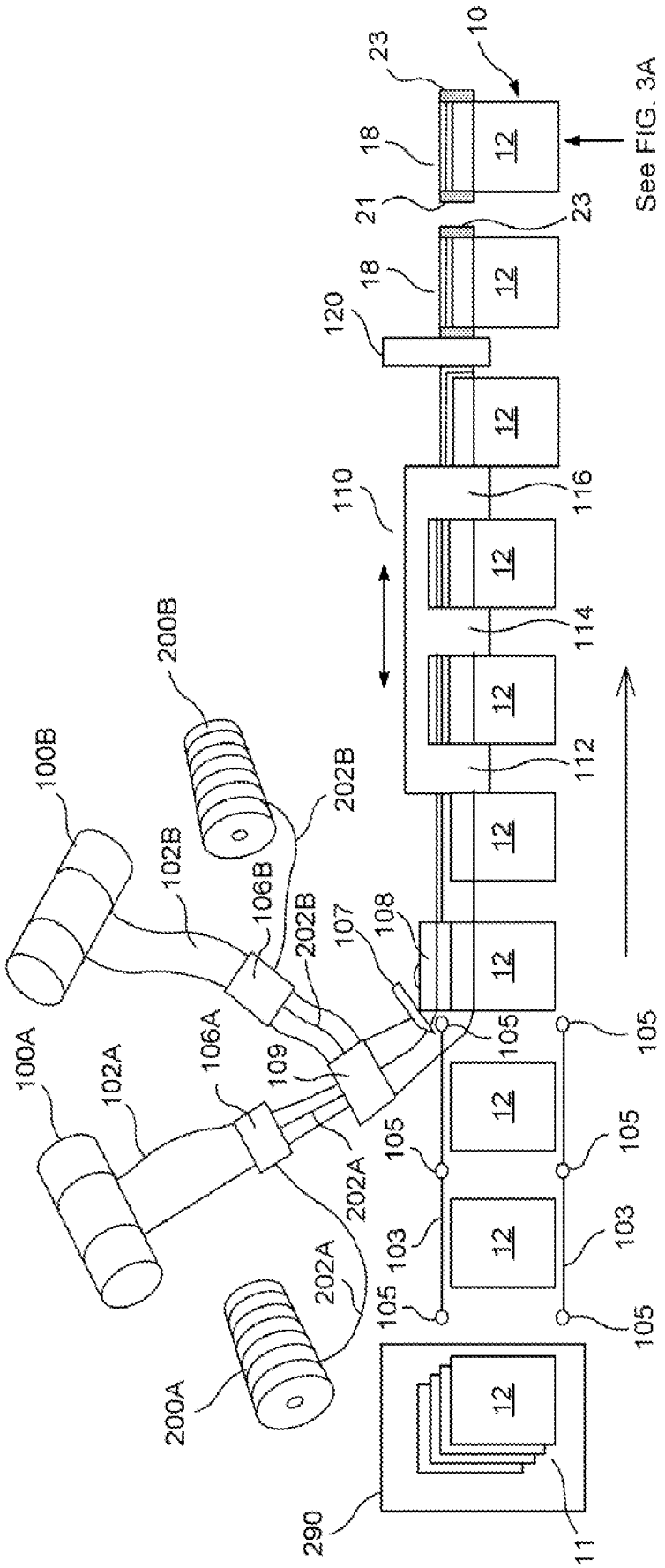

See FIG. 3A
10
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107
108
105
103
100A
102A
106A
109
202A
200A
100B
102B
106B
202B
200B
290
11
12

FIG. 8C

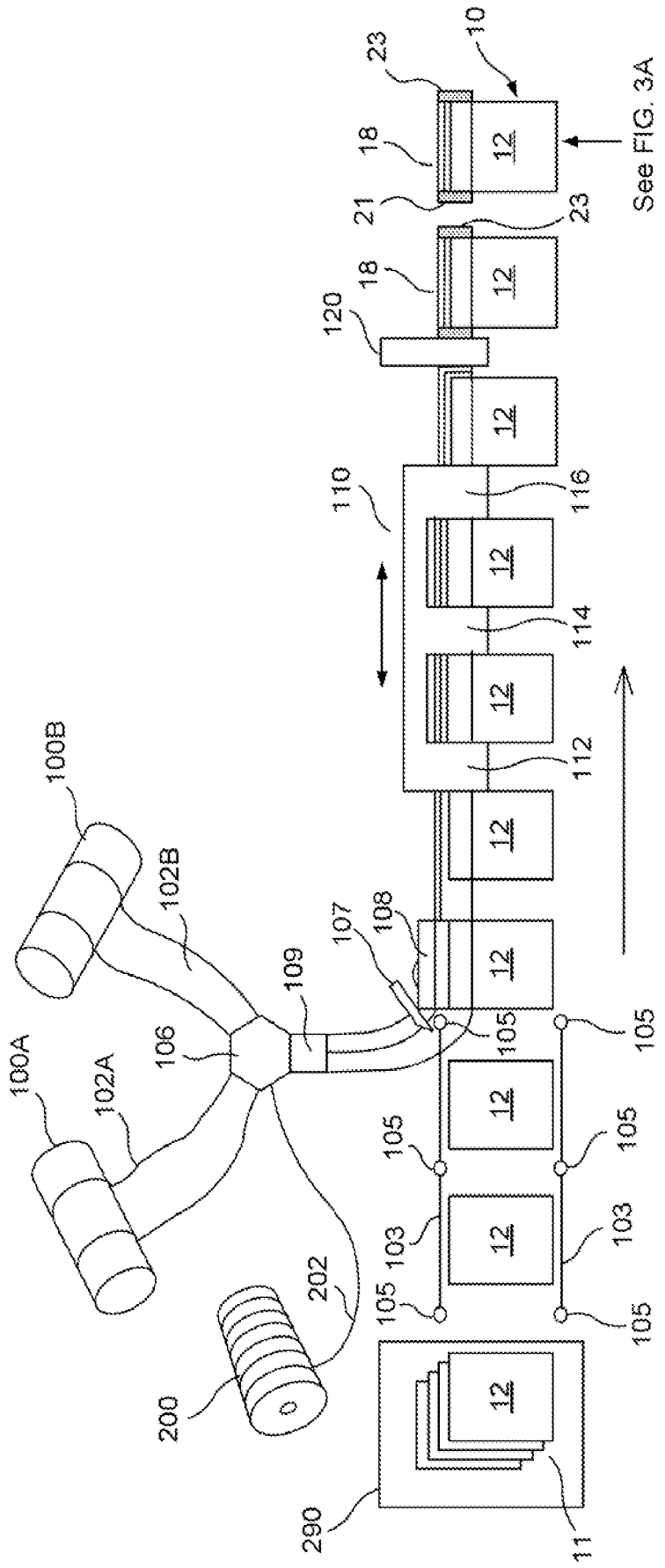

See FIG. 3A
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120
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116
114
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100B
102B
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109
106
105
100A
102A
103
202
200
290
11
12

FIG. 8D

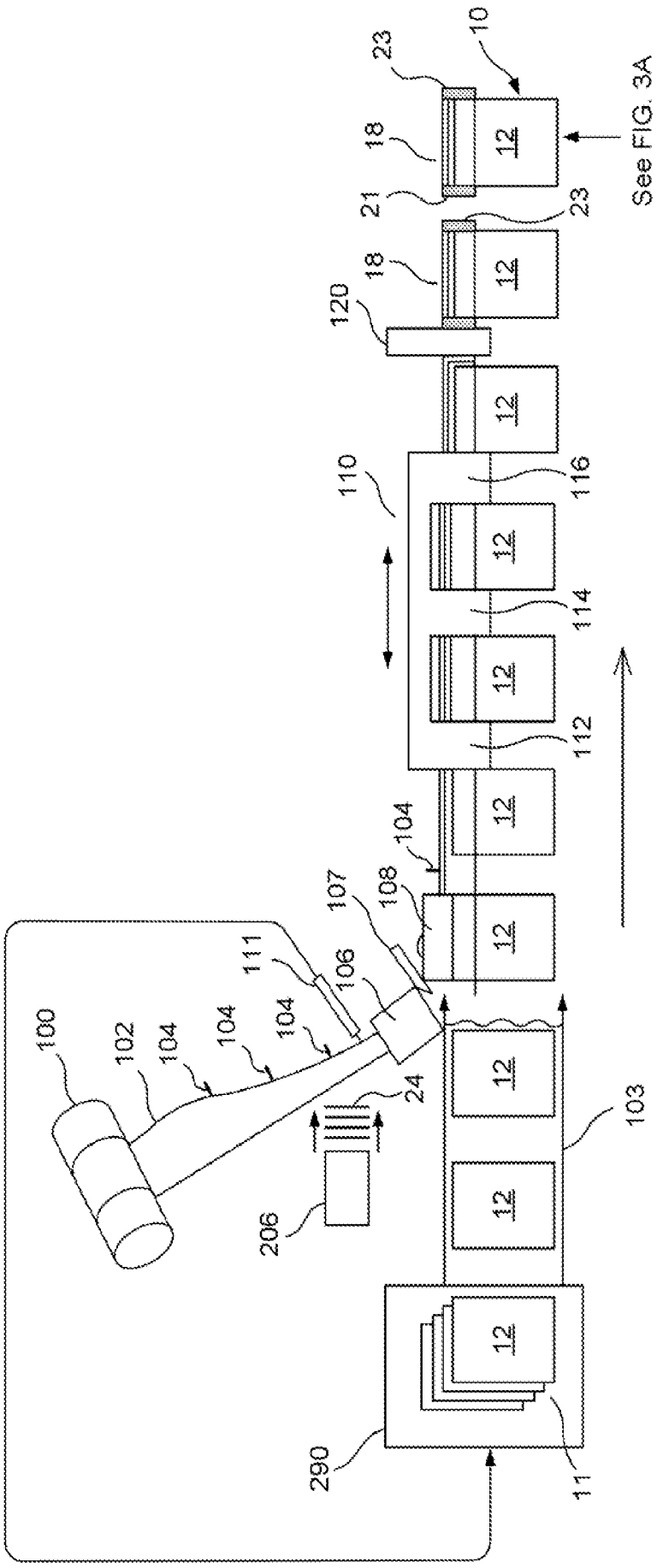

See FIG. 3A
10
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106
104
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102
100
24
206
103
290
11
12

FIG. 8E

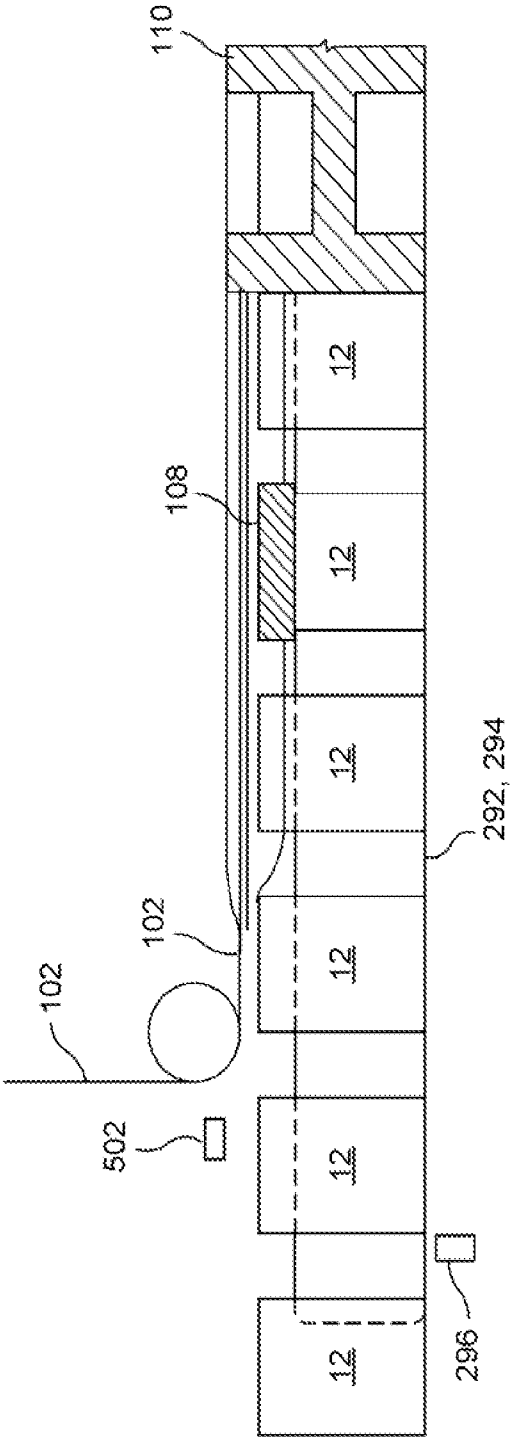


FIG. 8F

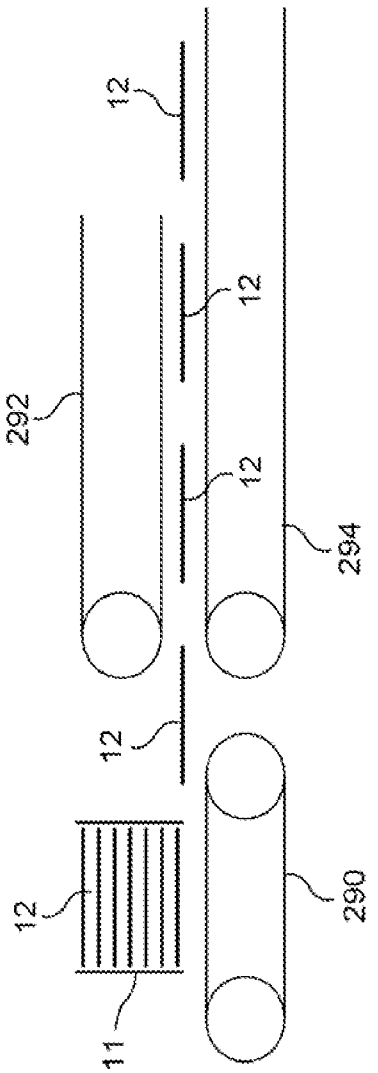


FIG. 8G

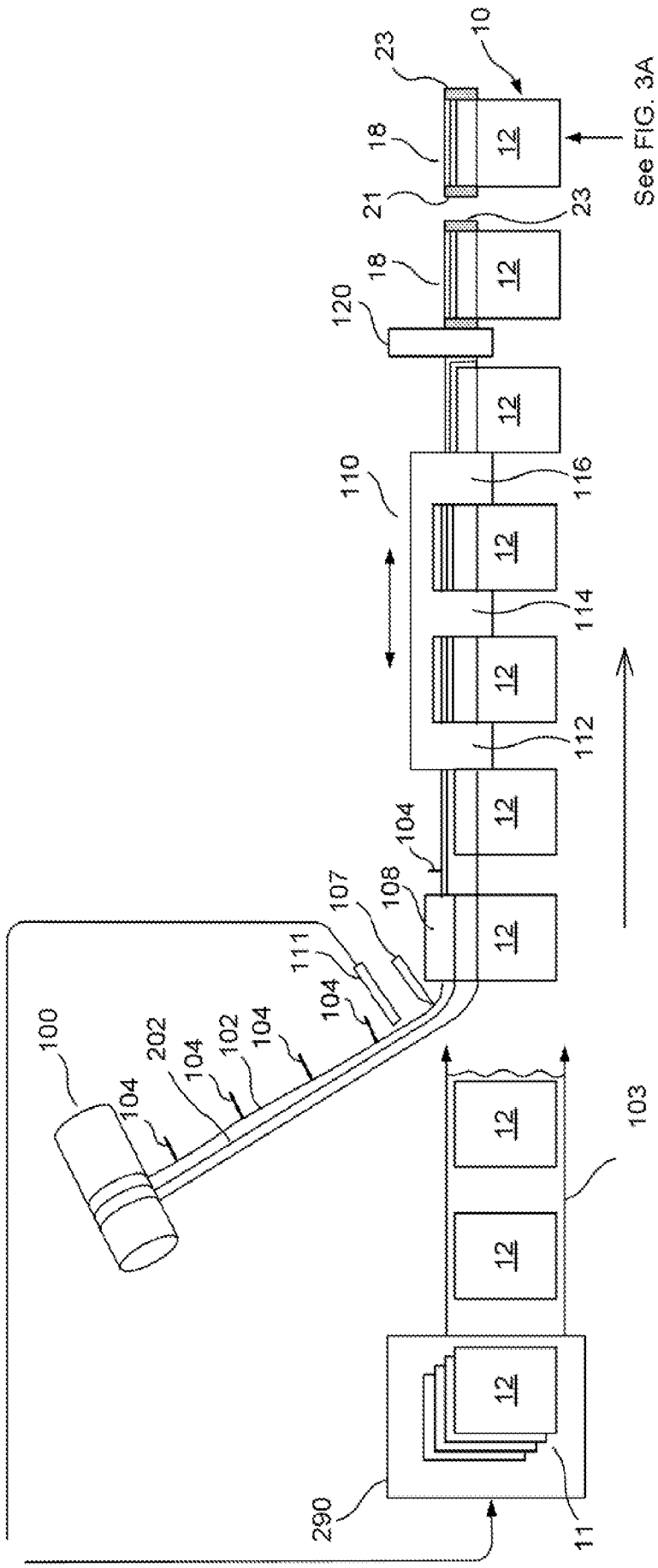

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See FIG. 3A
120
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116
114
112
104
107
108
111
100
202
102
103
290
11

FIG. 9A

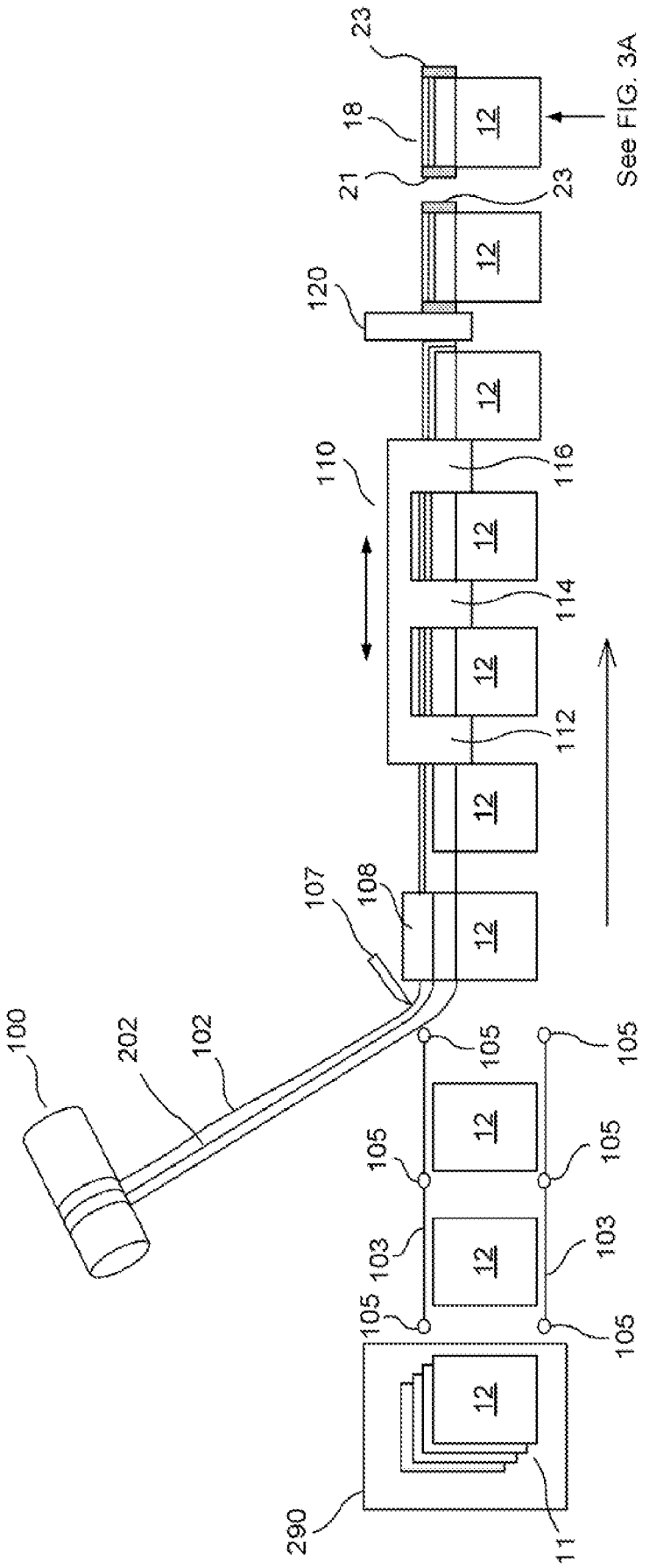

See FIG. 3A
23
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120
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105
105
105
103
103
290
11
12

FIG. 9B

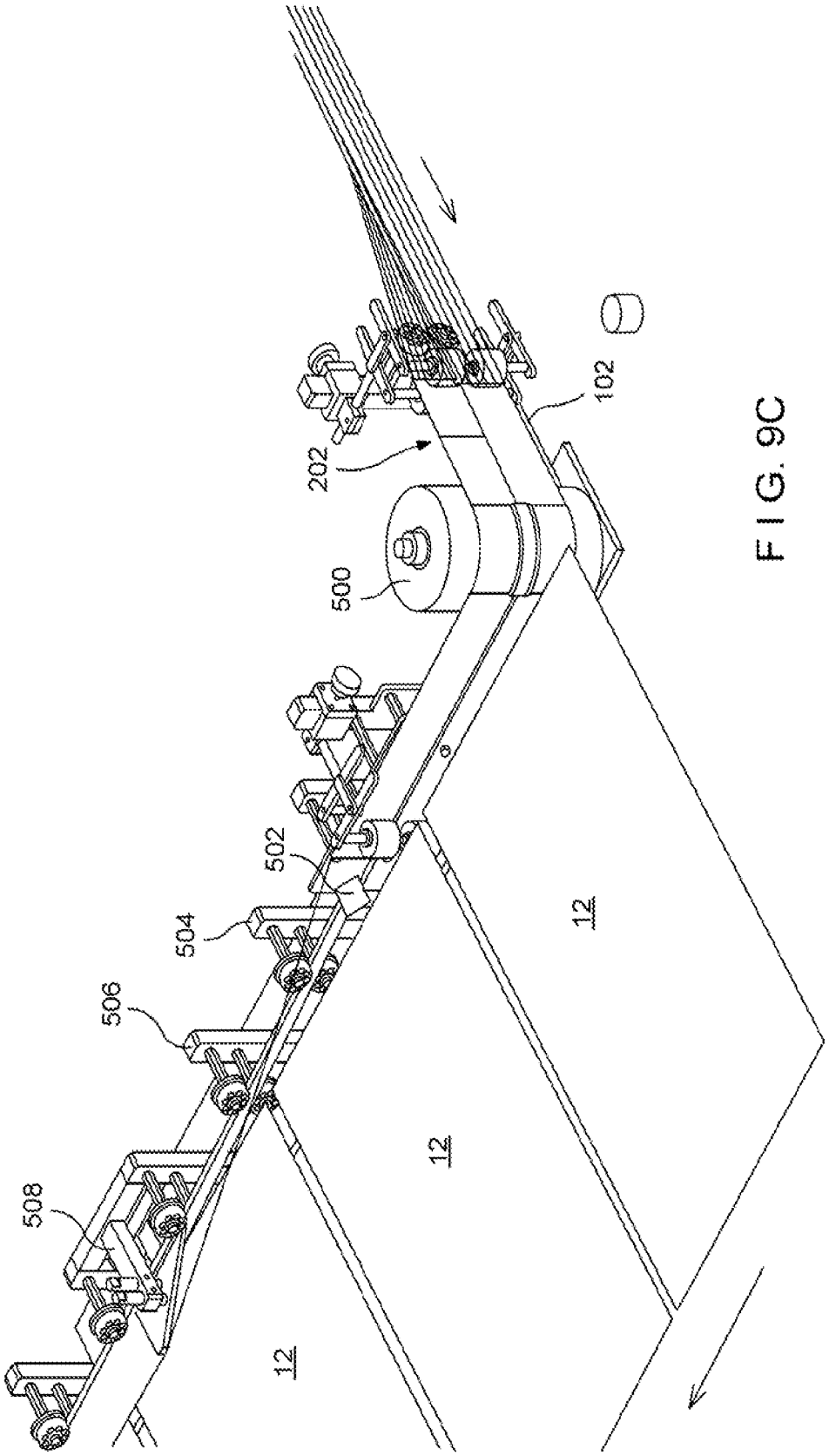


FIG. 9C

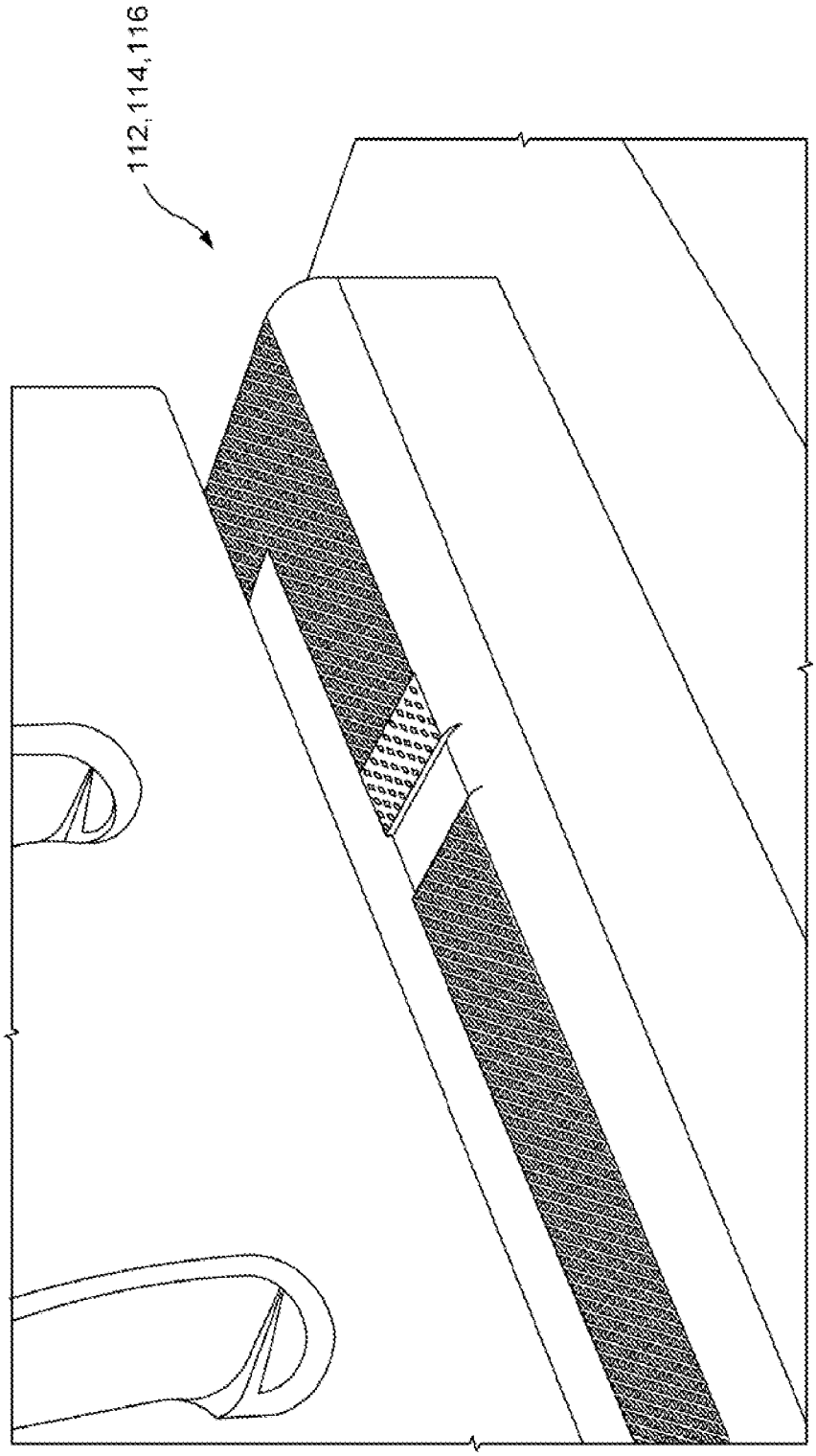


FIG. 10

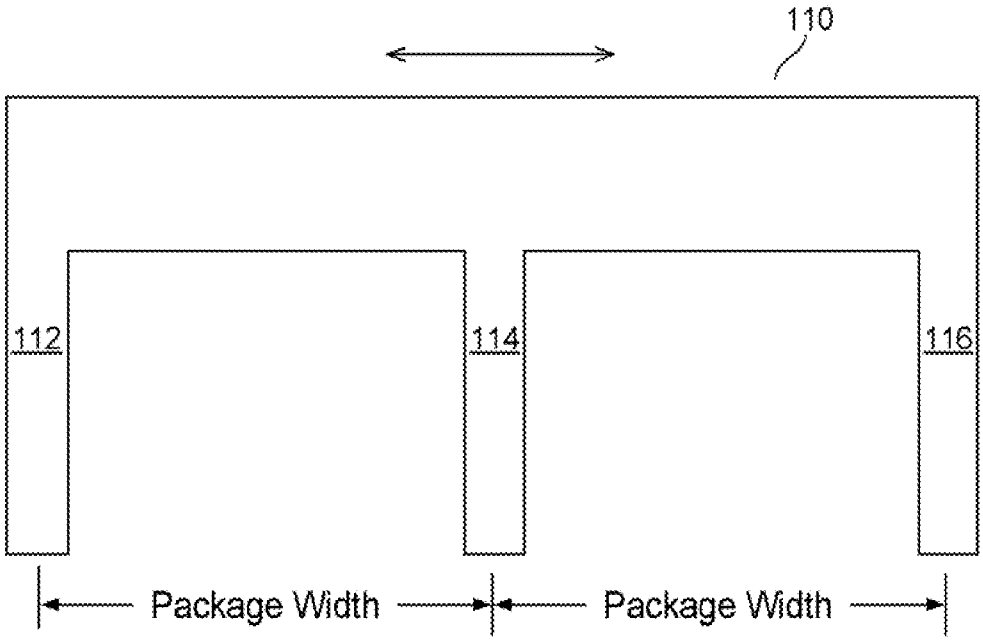


FIG. 11

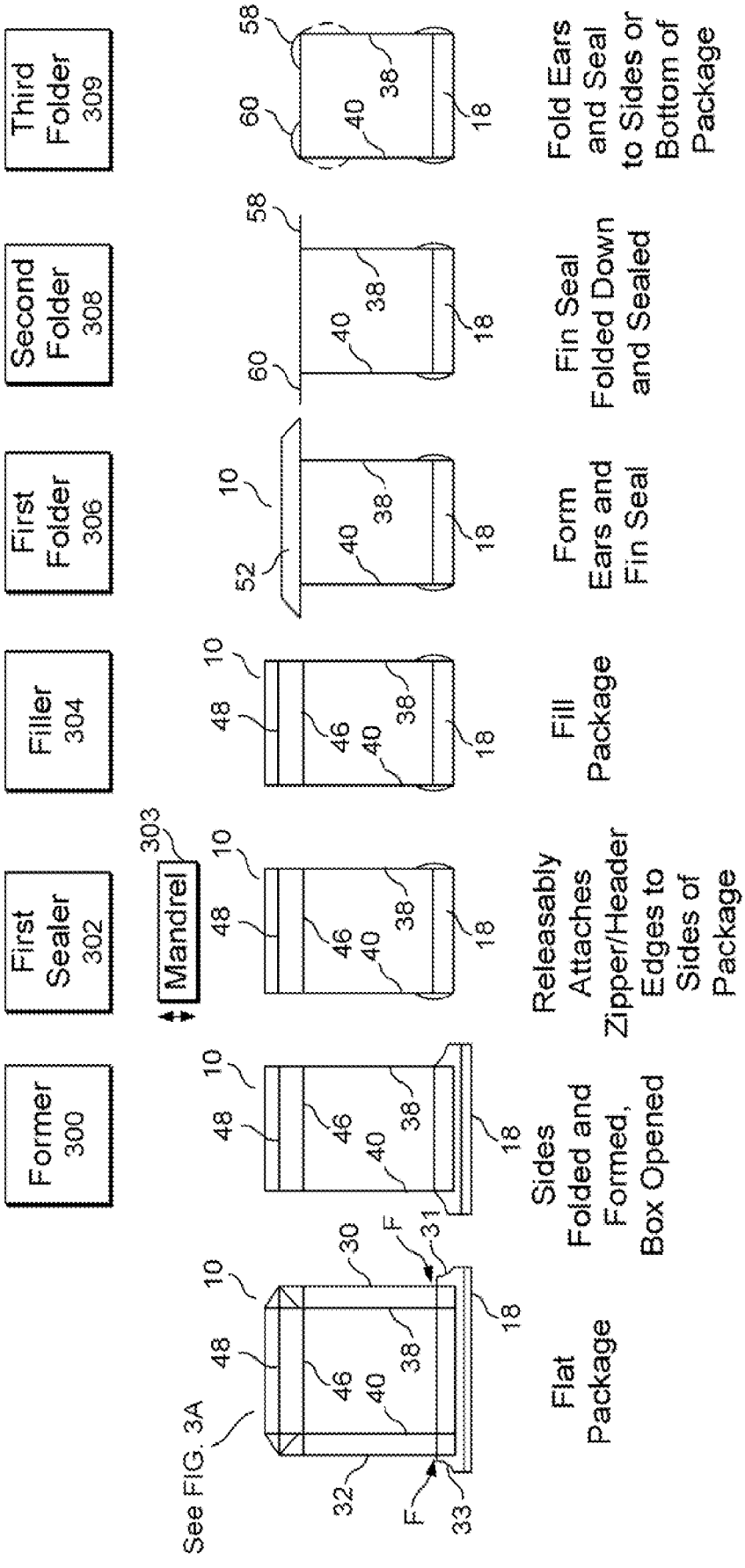

Former 300
First Sealer 302
Filler 304
First Folder 306
Second Folder 308
Third Folder 309
Mandrel
303
See FIG. 3A
Flat Package
Releasably Attaches Zipper/Header Edges to Sides of Package
Sides Folded and Formed, Box Opened
Fill Package
Form Ears and Fin Seal
Fin Seal Folded Down and Sealed
Fold Ears and Seal to Sides or Bottom of Package

FIG. 12

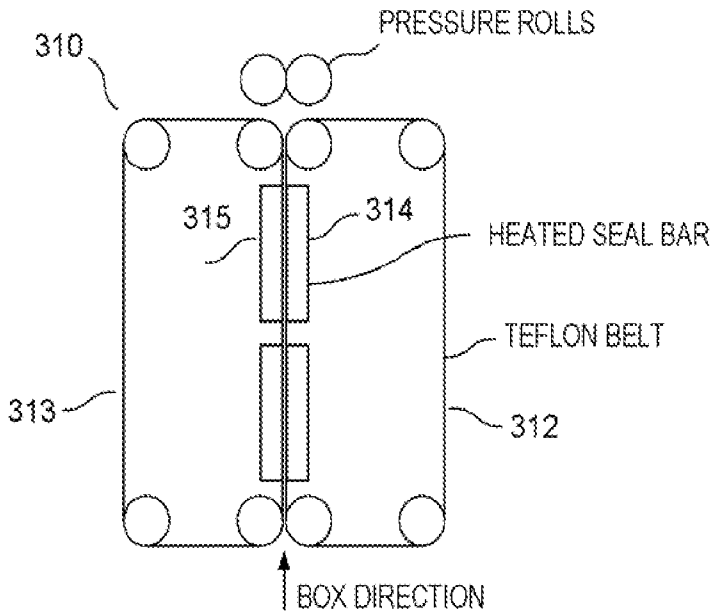

PRESSURE ROLLS
310
315
314
HEATED SEAL BAR
TEFLON BELT
313
312
BOX DIRECTION

FIG. 13

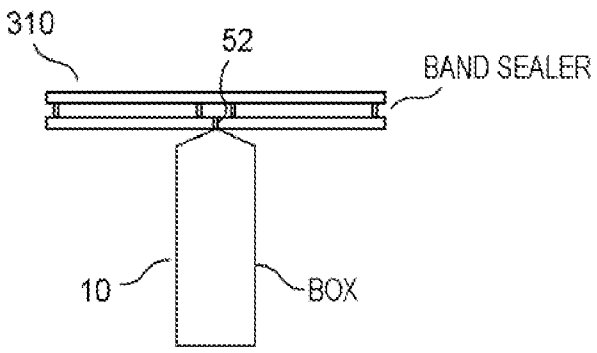

310
52
BAND SEALER
10
BOX

FIG. 14

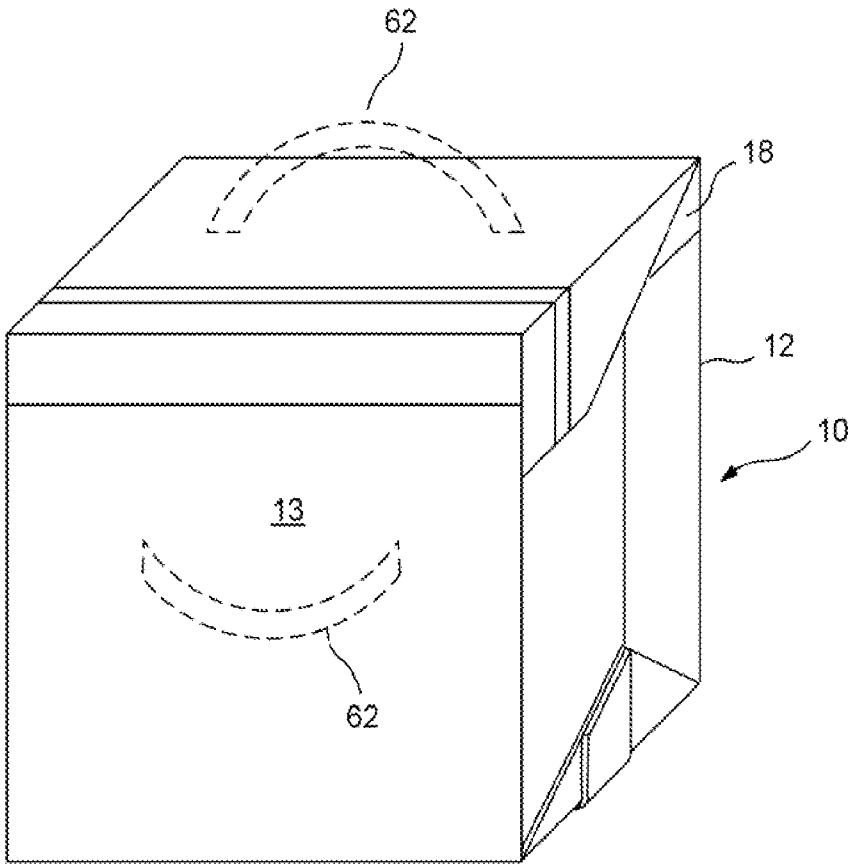


FIG. 15A

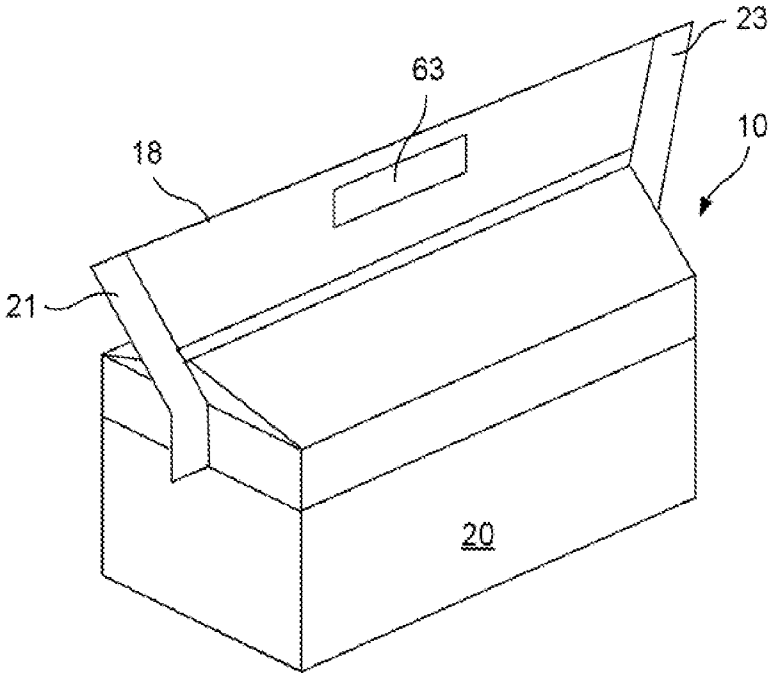


FIG. 15B

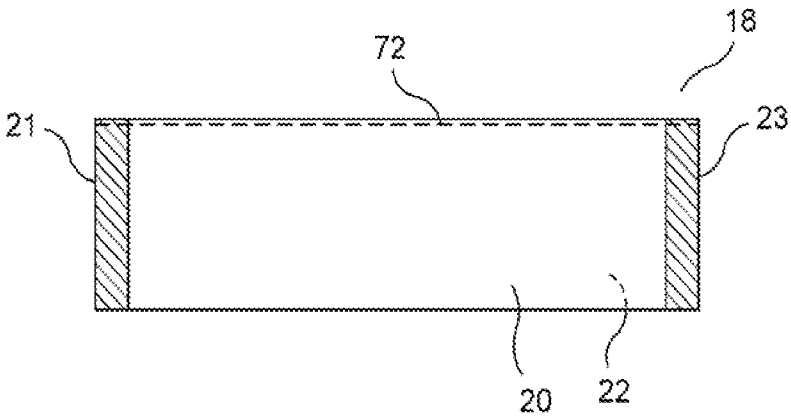


FIG. 16

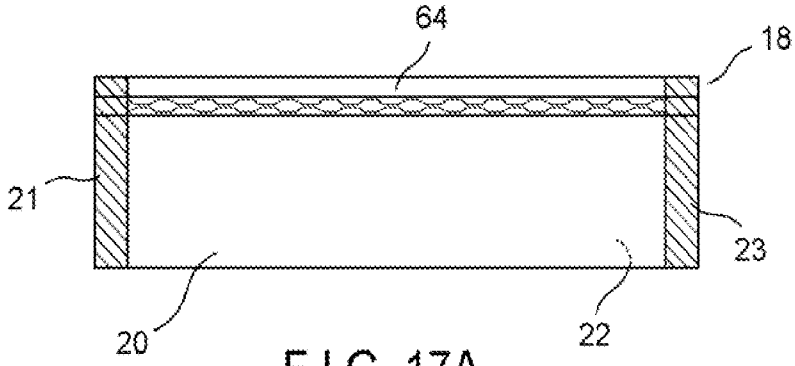


FIG. 17A

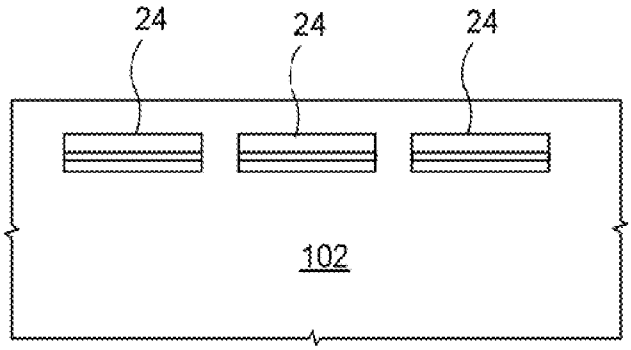


FIG. 17B

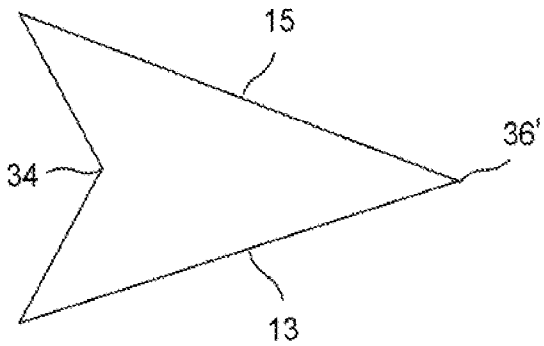


FIG. 18

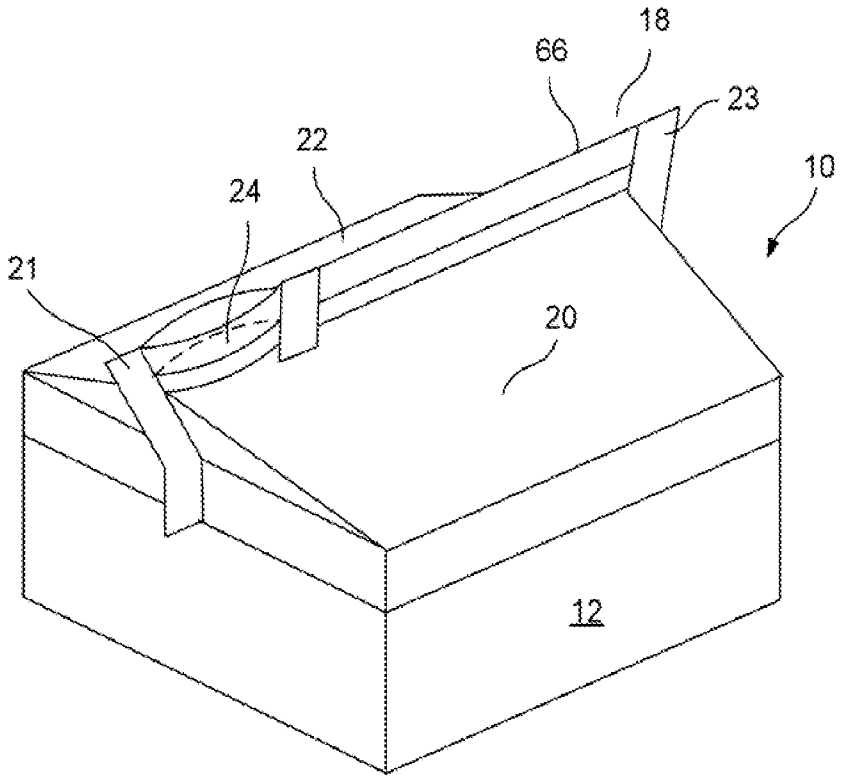


FIG. 19A

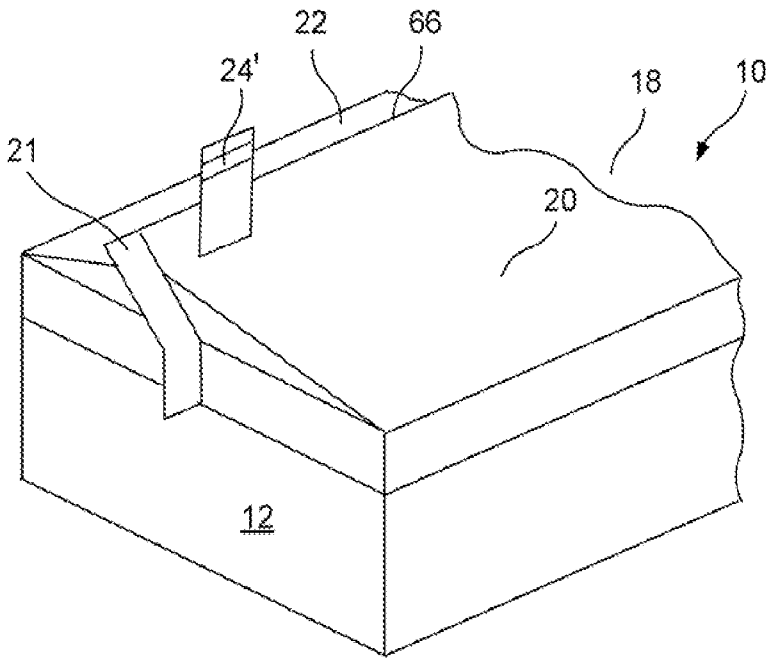


FIG. 19B

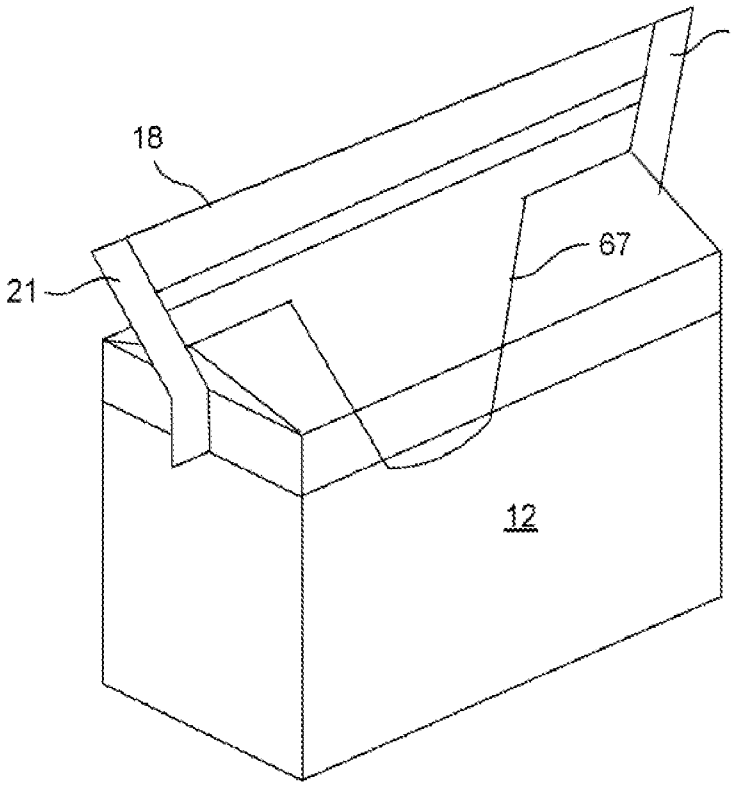


FIG. 20

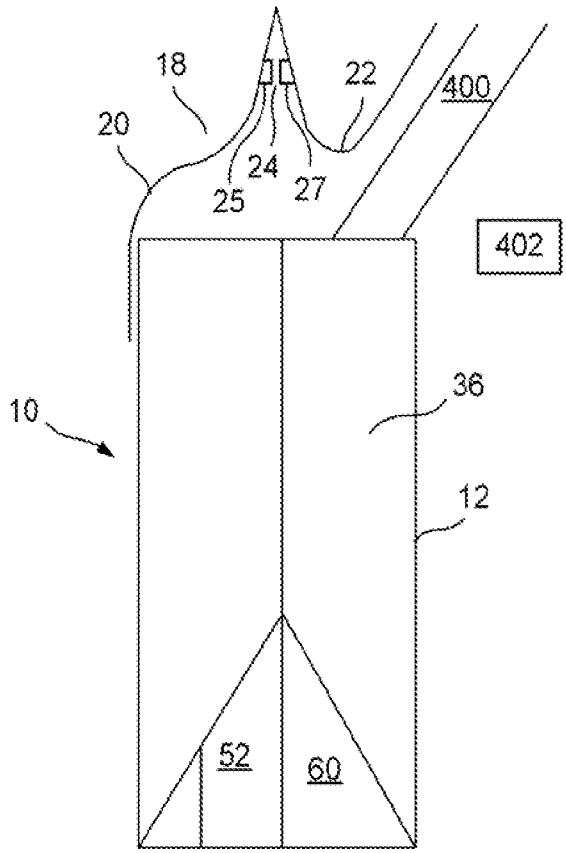


FIG. 21A

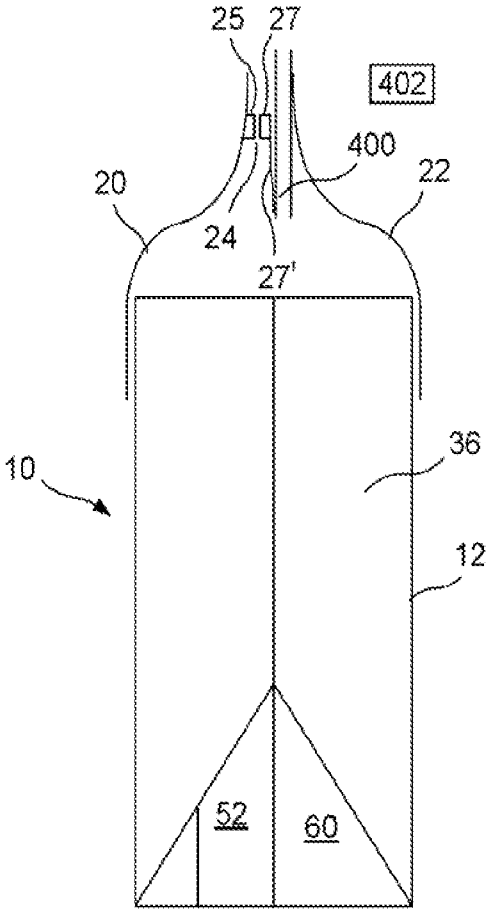


FIG. 21B

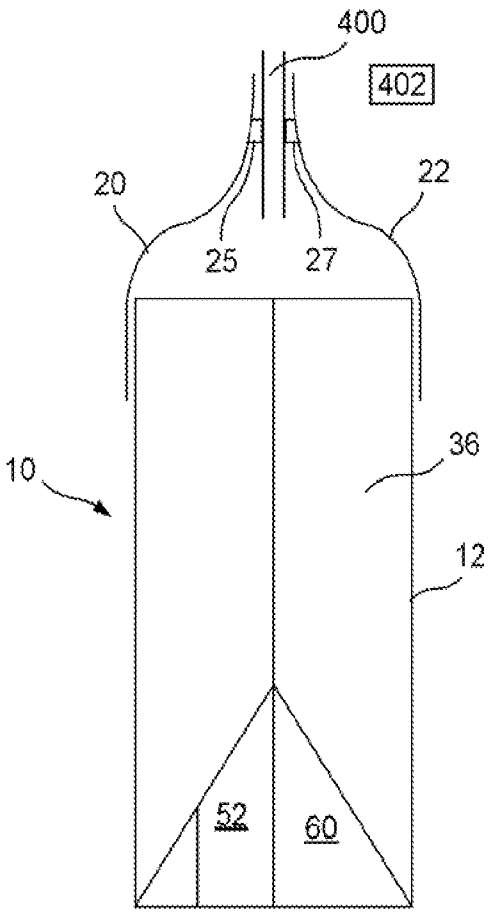


FIG. 21C

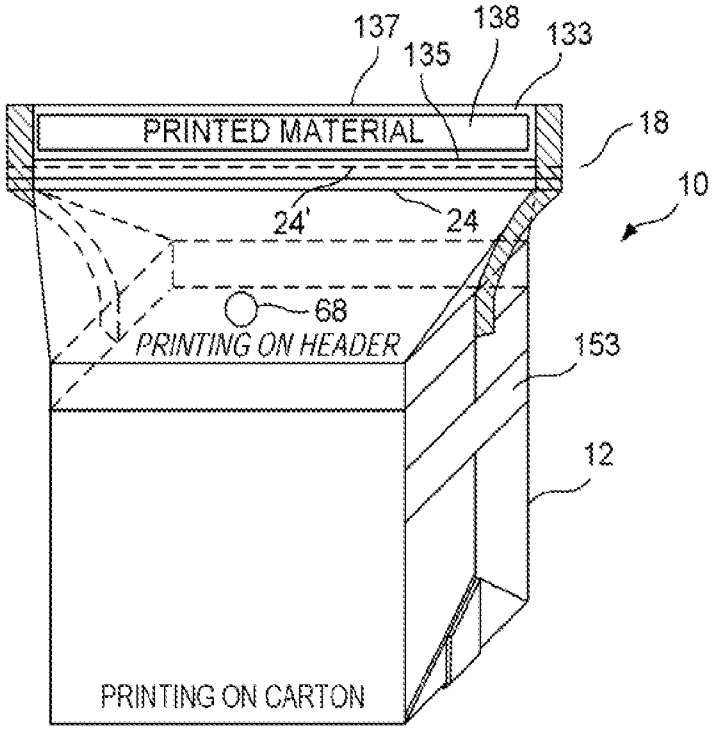

137
135
138
133
PRINTED MATERIAL
18
10
24'
24
68
PRINTING ON HEADER
153
12
PRINTING ON CARTON

FIG. 22

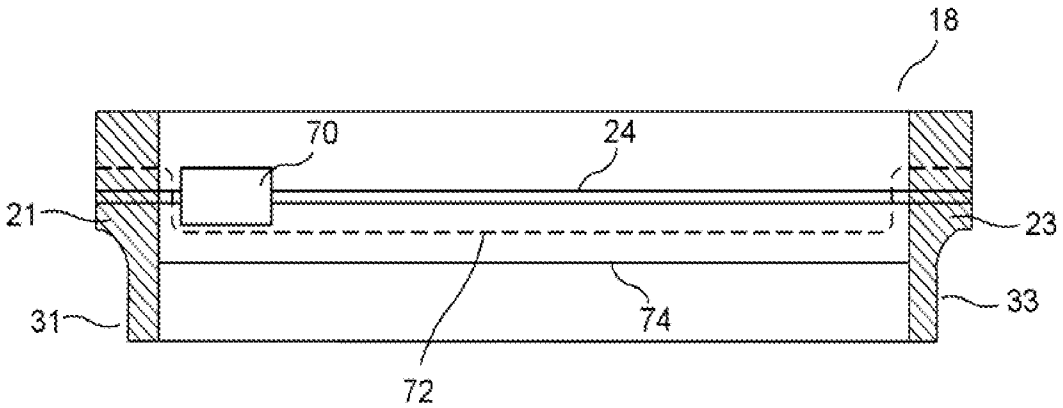

18
70
24
21
23
31
74
33
72

FIG. 23

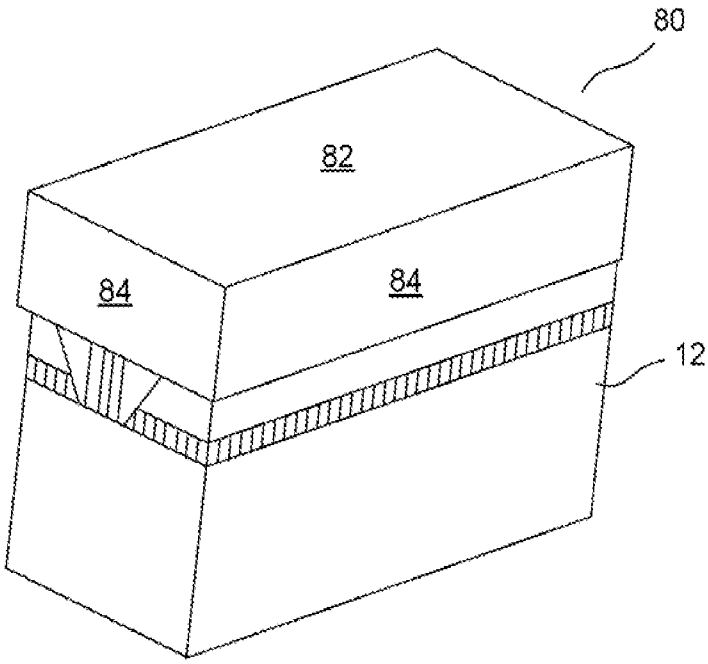


FIG. 24

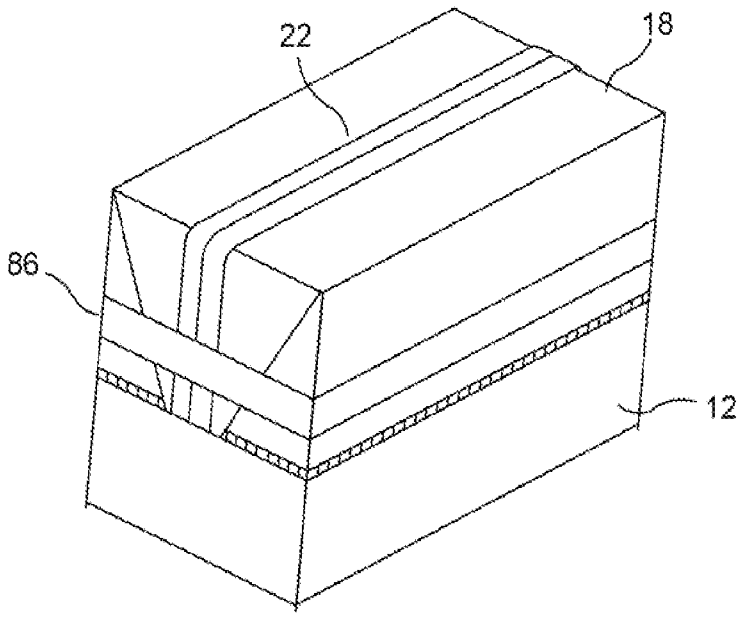


FIG. 25

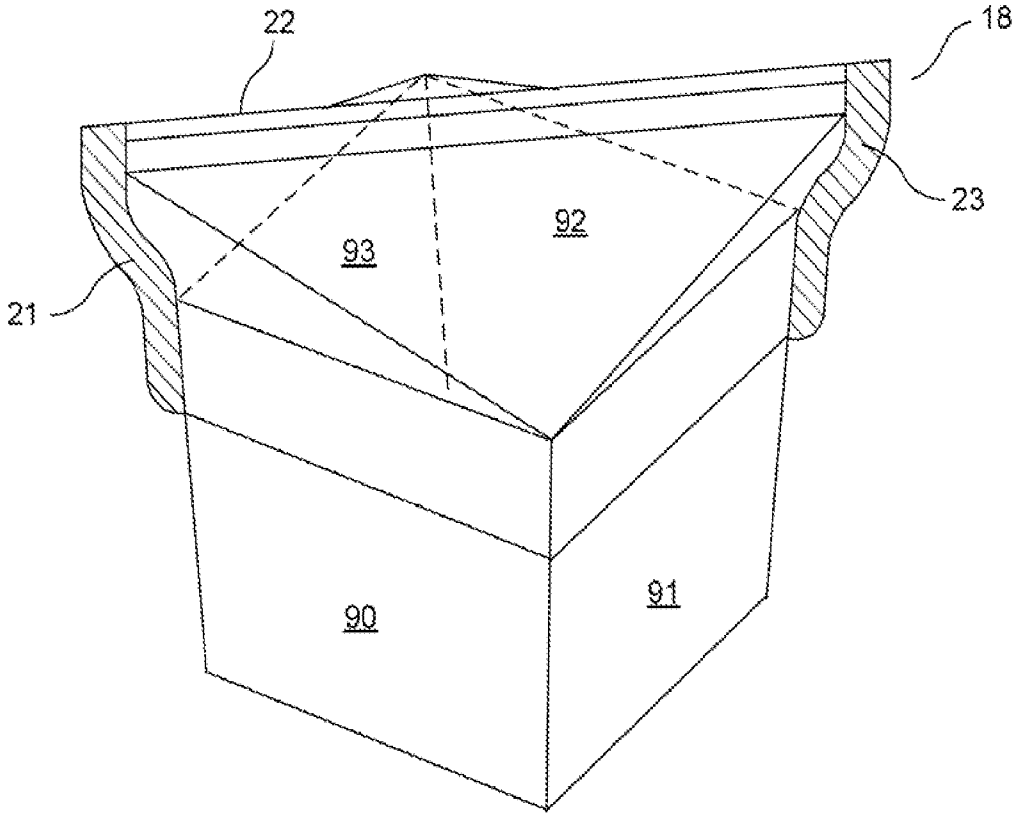


FIG. 26

FIG. 27A

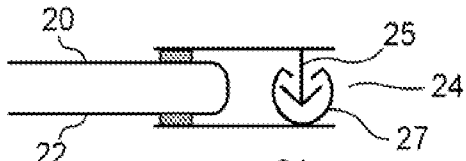


FIG. 27B

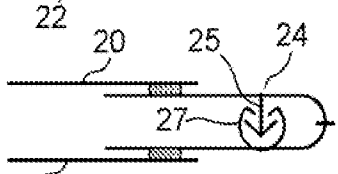


FIG. 27C

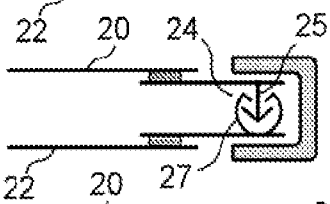


FIG. 27D

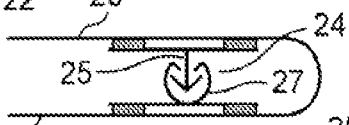


FIG. 27E

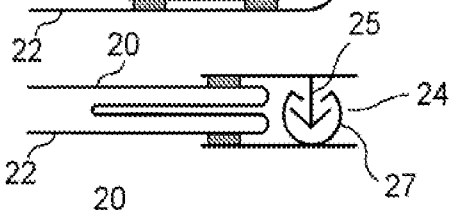


FIG. 27F

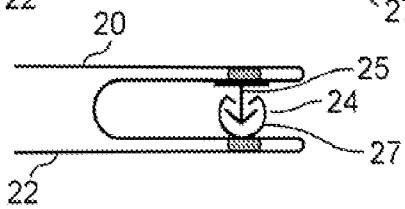


FIG. 27G

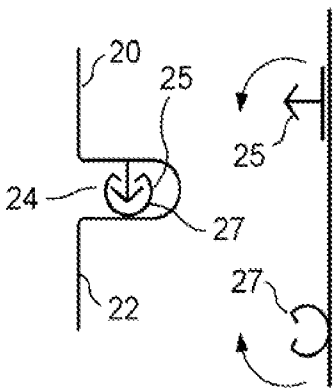


FIG. 27H

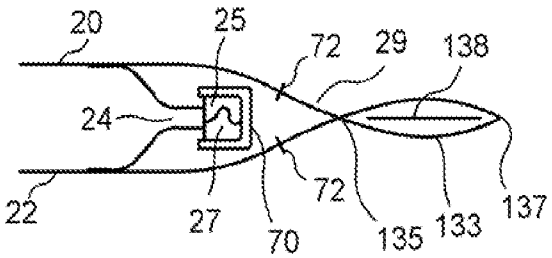
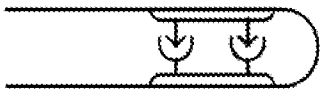


FIG. 27I



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 10/48619

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - B65D 6/00; B65D 8/14 (2010.01)
USPC - 220/7
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC(8): B65D 6/00; B65D 8/14 (2010.01)
USPC: 220/7

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC: 220/6, 4.01; 383/61.2, 61.1, 42, 63, 64; 229/123.2; 220/$; 383/$; 229/$

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
USPTO PubWEST (PatFT, AppFT); Google Scholar, Web. Terms: fill$, package, container, box, zipper, ziplock, zipbox, ziploc, rigid$, stiff$, slider, header, carton, cardboard, bottom, plastic, polymeric, paperboard, side, wall, former, filler, folder, reclos$, reseal$, body

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 7,004,378 B1 (THARPE, JR.) 28 February 2006 (28.02.2006), col 2, ln 35-51; col 2, ln 55-62; col 3, ln 37-39; col 4, ln 19-28; col 4, ln 56 to col 5, ln 13; Figs. 2, 5	1-60
Y	US 7,160,029 B2 (BEIN, et al.) 09 January 2007 (09.01.2007), col 3, ln 10-60; col 5, ln 18-32; Figs. 3, 9b	1-60
Y	US 6,006,984 A (CHUNG, et al.) 28 December 1999 (28.12.1999), col 12, ln 4-15; col 13, ln 50-64; col 16, ln 25-34; col 17, ln 9-35; col 21, ln 31-42; col 21, ln 66 to col 22, ln 24; col 23, ln 34-36; col 24, ln 10-25; Figs. 4B-5, 8A-11, 13A-16	3-18, 21-60

☐ Further documents are listed in the continuation of Box C. ☐

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
02 December 2010 (02.12.2010)	13 DEC 2010
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774