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(54) Title: A METHOD OF CREATING A BLANK THAT CAN BE FOLDED FROM A PLANAR FORM INTO A THREE-DIMENSIONAL RECEPTACLE FOR PACKAGING AND A CORRESPONDING BLANK

(57) Abstract: A planar blank that can be folded into a three-dimensional receptacle for packaging. The blank is formed of a laminate of a sheet of flexible material adhered to a sheet of film. A plurality of faces (16, 18, 22, 31) meet at a first corner (146). Other faces (12, 21) meet at a second corner (147) that is separate from the first corner (146) in the blank, but which coincides with the first corner in the receptacle. A web of unsupported film (19) is provided at the first corner which is crumpled when the corners (146, 147) are brought towards one another to form the receptacle to form a non-hermetically sealed gas barrier in the coinciding corners. A method is disclosed of severing the blank without leaving any unconnected flexible material or film and leaving unsupported film material in the web regions. Between adjacent flange portions, a U-shaped cut-out (63) is formed. A cut line (58) is formed in the flexible material but not the film extending from the base of the cut-out to the corner. The film which covers the cut line is configured to stretch when the flanges are out-turned.

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A Method of Creating a Blank that can be Folded from a Planar Form into a Three-dimensional Receptacle for Packaging and a Corresponding Blank

The present invention relates to a method of creating a blank that can be folded from a planar form into a three-dimensional receptacle for packing and to a corresponding blank.

The method has particular applications to food packaging and the like and has been explicitly designed as a sandwich pack. It will be appreciated, however, that the idea being described is applicable to any form of packaging which is folded from a planar blank and in which there is a need to have a pack which minimises gas passages into the pack, but which is not hermetically sealed.

The applicant currently produces a number of sandwich packs. One of these is known as the Freshpack. This is a non-hermetically sealed pack which is designed to keep the contents of the pack fresh for up to three days after packing depending upon the ingredients used. Such sandwich packs are produced from blanks and are semi-assembled before being folded in half along a centre line and supplied to food producers as a stack of packs. The packs are then opened up and filled in a die which has a shape corresponding to the shape of the pack. The same die then presses a hinged lid over the top of the pack and attaches it to an out turned flange at the opening to the pack.

Such a pack is very successful as it is cheap to produce and easy for an end user to fill and close.

Another product sold by the applicant is a modified atmosphere pack. This is the subject of an earlier application WO 2008/025982.

This pack is similarly formed by being folded from a blank of a laminate of a flexible material such as card and film. Such a pack is hermetically sealed because there is a continuous layer of the gas barrier film which surrounds the content of the pack. Where there are junctions between sides of the pack, the film is fused in these regions to preserve the hermetic seal. Inevitably in a pack folded from a blank, there are corners at the edge of the blank where pin holes can be created. In these regions, our modified atmosphere pack is provided with bridging film for example between adjacent flanges. Such film is stretched across a gap between adjacent flanges and is fused to the lid thereby eliminating any pin

holes and preserving the continuous layer of the gas barrier film. At the main join between the two free edges of the blank which are brought together, there is a fused surface to surface contact between two film surfaces of the laminate. This guarantees the hermetic seal between the free edges but results in a rib at the apex of the container and along one side. This makes production more expensive and needs a special de-nester to open packs ready to be filled to accommodate the rib. Such containers are able to keep a sandwich fresh for up to 28 days.

The two types of pack have very different customer bases in that a retailer such as a supermarket with a high turnover of sandwiches who makes their sandwiches in a central depot will require the first product while a retailer such as a petrol station with a lower turnover of sandwiches supplied from a central depot will want the much longer life.

There is a third category of such packs which are the non-airtight packs which are favoured by small sandwich makers that make their sandwiches on the premises which only need to last for one day, but these are not relevant to the present invention.

The above described modified atmosphere pack are much more expensive to produce and require more complex handling machinery for the end user as more care is required in their construction and assembly in order to ensure the hermetic seal.

The present invention is aimed at providing an improvement to the non-hermetically sealed packs which will extend their shelf life without adding to the cost and which can be filled and closed by a user using simple equipment and, ideally, on existing equipment.

Whilst the high turnover retailers referred to above are generally happy with the current three to four days of shelf life, there are enormous incentives if this can be extended only by a single day. Looking at the food wastage patterns for such sandwiches, it is estimated that a 20% saving in wasted packs could be achieved with an increased shelf life of one day. A longer shelf life also gives producers the ability to produce more of one type of sandwich in a single run which streamlines the production and reduces overall costs as fewer changes are needed as the product is changed.

Recognising that a hermetic seal provides more than is technically necessary with associated additional costs to such customers, the present invention takes the approach of

improving on the existing non-hermetically sealed design by attempting to make existing gas paths through the pack as small as possible.

According to a first aspect of the present invention, there is provided a blank according to claim 1.

The present invention recognises that, in any three-dimensional receptacle which is formed from a folded blank, there is inevitably at least one region in which a number of free edges must come together in one corner. This creates a pin hole which is a significant gas path into the container in our Freshpack container. Rather than trying to create a hermetic seal in this region using face to face film contact of two laminated portions to replicate our modified atmosphere pack, we have, instead, created a web of unsupported film in the vicinity of this corner. This web is designed to be crumpled when the receptacle is formed and attaches to at least one of the faces from the other part of the blank which is at this corner.

Such unsupported film which crumples in this way is generally avoided as it is not possible to control the manner in which it crumples and its effect is therefore unpredictable. However, by having this film, the pin hole which is otherwise present at this corner is at least covered by a film. The crumpled film in the immediate vicinity of this corner which is attached to the fourth and/or fifth face provides, at worst, a tortuous path around the film in this region. Thus, we have replaced what was previously a simple pin hole with an arrangement which provides an imperfect cover for this hole, but which means that any gas path in this region is not only much smaller than the previous pin hole, but is long and tortuous such that gas flow in this region is greatly inhibited. This provides a significant contribution to increasing the shelf life of the pack without the expense of hermetically sealing it.

According to a second aspect of the invention there is provided a receptacle formed from a planar blank according to claim 1. According to a third aspect of the present invention there is provided a method of forming the receptacle comprising forming a receptacle according to claim 1 and folding it to create the receptacle.

The present invention also extends to the method according to claim 4.

Such an approach is similar to the approach adopted in WO 2008/025982 in which a first series of cuts are formed prior to lamination and then a second cut is formed to sever the blank and to form unsupported web portions in corners which are between adjacent out-turned flanges on the face which receives the lid. However, in WO 2008/025982, all areas of film, without board, have the board cut and fully removed during the first cutting process, to make "windows". Although the small windows, that are on the flange of the pack, require further cutting, to produce the final flat packs, this is carried out after the pack has been folded in half, and the cut is a complete cut through the film and the board of the other half of the pack, and the board acts only to support the film during cutting, for a clean cut. No board within the final window area is removed during this second cutting process, which is made to release the final packs from the web, rather than complete the window.

In the present invention, the outline cut is also made through the film first, and into the flexible material. But in this case the flexible material has not been removed from the web regions in the through cut. In the outline cut the cutter uses a shallower blade in this area, so that the film is cut but the blade, at most, only enters into the surface of the flexible material below, leaving the flexible material within the web region still attached to the flexible material in the waste area around the blank. This flexible material will therefore form part of the waste matrix such that it pulls away with the waste matrix, to leave a clean window on the edge of the pack. Whilst it makes no difference to the fully cut blank whether the flexible material in the web region is removed in the through cut, or with the waste in the outline cut, as in this case, the effect of the former would be to create numerous very small pieces of detached flexible material in the vicinity of the die. When the die is moving at high speed, the creation of numerous such small loose bits of material causes a contamination problem, as they are extremely difficult to remove from the vicinity of the rotary cutter after cutting so that they cannot, in practice, be tolerated. The sequence of cuts described above avoids any such loose material. It does, however, leave the unsupported web of material with a well-defined outer edge. As such, this technique is suitable for forming the web of unsupported material according to the first aspect of the present invention. It also can be used to create unsupported film regions in an out-turned flange at the entrance to the receptacle which can seal with the lid.

A further aspect of the invention is defined in claim 5.

In the Freshpack container, there is no U-shaped cut-out between adjacent flange portions. Instead, there is simply a straight cut between the flange portions. These simply separate when the flanges are out-turned creating a pin hole between the lid and the flanges at the interface. Our modified atmosphere pack does have a similar U-shaped cut-out, but this extends for less than half the depth of the flange portions. The cut line is therefore significantly longer as a consequence of which, when the flanges are out-turned, the film has to stretch far more than it does in the present invention in which the cut line is much shorter. This longer cut line is essential in the modified atmosphere pack as there must be enough depth of film in this region to form a hermetic seal with the lid. However, this configuration cannot be adopted with our Freshpack design which uses a film which could not be stretched to the required degree. Because the shorter cut line requires the film to stretch to a much smaller extent than in the modified atmosphere design, this is able to provide a small amount of film which will cover the pin hole which would otherwise be present but does not require a stretchier film. The aim of the invention is to cover the pin hole rather than provide a hermetic seal such that the smaller depth of film which is stretched between the flanges in this corner is adequate for the purpose. Preferably, the length of the cut out is less than 5mm and more preferably less than 4mm.

An example of a method, blank and pack according to the present invention will now be described with reference to the accompanying drawings, in which:

Fig. 1 is a plan view of a blank from which the pack is formed;
Fig. 2 is a plan view of the pack in a “fold flat” configuration;
Fig. 3 is a side view of the pack in its erected configuration with the lid open;
Fig. 4a is a schematic diagram showing the various stages in the method of production of the blank;
Fig. 4b is a schematic diagram showing the various stages in the method of converting the blank to flat packs
Fig. 5 is a diagram showing the first set of cuts;
Fig. 6 is a similar diagram showing a second set of cuts;
Fig. 7 is a similar diagram showing the combined set of cuts;
Fig. 8 shows a detailed portion of a web region; and
Figs. 9A-9D show cross-sections through line IX-IX in Fig. 8 in various stages of the manufacturing process.

The pack comprises a first face 1 which is in the shape of a right angled isosceles triangle with two shorter edges 3, 4 which are formed with score lines and a long edge 5 formed with a score line. The first face 1 also has a fold-flat score line bisecting the triangular face.

A lid 8 is formed on the opposite side of the longer edge 5. The lid 8 has a window 9 which is optional and can be of any shape. The window 9 is formed by a film which is laminated onto the card. As shown in Fig. 1, the card is the uppermost layer and the film is laminated to the side of the card facing away from the plane of the paper. The outer peripheral region 10 of the lid 8 will connect the flanges to close the pack as described below.

The fold flat line 6 extends across the centre of the lid 8 as shown in Fig. 1.

A second face 12 which is generally rectangular is provided on the opposite side of the short edge 3 and has a flange 13 separated from the edge 14 of the face 12 closest to the lid 8 by a score line. This structure is replicated with a third face 16 extending from the second short edge 4 and having flange 17. At the lower edge of this third face 16 is a tab 18 which folds onto the second face 12 to close the bottom corner of the pack. This is assisted by a web 19 of film which projects beyond the card as described in greater detail below.

The pack has a fourth face 20 as shown in Fig. 3. This is formed of two parts, namely a first panel 21 extending from the second face 12 and a second panel 22 extending from the third panel 16. As can be seen in Fig. 3, there is a fold flat line 23 extending across the second panel 22 such that, in the finished pack, it is in alignment with the fold flat line 6 through the first face 1 and lid 8.

The second panel 22 extends beyond the fold flat line 23. On the other hand, as seen in Fig. 3, the first panel 21 stops short of the fold flat line 23 as can be seen in Fig. 3 where its outer edge 24 is short of the fold flat line 23.

In order to partially assemble the pack from the blank, the tab 18 is folded up and the second and third faces 12, 16 are brought together at the apex 30. Adhesive is applied to the tab 18 to adhere it to the film on the first face 12. At the same time, the fourth face is formed by a similar bonding process in which an overlapping portion 31 of the second panel 22 is adhered to the first panel 21.

In this form, the partially assembled pack is then folded flat along fold flat lines 6 and 23 into the configuration shown in Fig. 2. A stack of containers in this configuration take up very little space, and can be packed into suitable outers for supply to an end user.

An end user will then either transfer stacks of packs into an automated denester to open and load the packs into the sealing machine or unfold a pack, and place it by hand into the feed conveyor for a sealing machine, which has suitably shaped hoppers that match the dimensions of the open top of the pack and provide support for the prismatic shape of the pack body. The pack is then filled with a sandwich before the lid is folded over and sealed either by hand or by use of automated equipment.

At the top edge of the fourth face 20 is a sealing flange made of a short flange portion 40 which extends across a top edge 42 of the first panel 21 and a long flange portion 42 which extends across the top edge 43 of the second panel 22 beyond the fold flat line 23. A web 44 of film is retained in a corner of the blank between the overlapping region 31 and the long flange portion 41. This web 44 forms a seal between the flange portions 40, 41 and the lid 10 in the finished container. As can be seen in Fig. 3, there is a gap 45 between the flange portion 40, 41 in which part of the web 44 is visible.

Because this gap is offset from the fold flat line 23, when the short 40 and long 41 flange portions are folded downwardly and outwardly from the upright position shown in Fig. 3 to allow the lid to be brought into place, it can be seen that any pressure applied into the plane of the page in Fig. 3 which would tend to cause the pack to buckle inwardly along fold flat line 23 will be resisted as the long flange portion 41 is, at this stage, angled with respect to the fourth face 20 such that it will resist any such inward buckling. This allows the flange portions 40, 41 to hold the shape of the open container while the lid 8 is folded over and the film on the outer periphery 10 of the lid is bonded to the film on the flanges 13, 17 and flange portions 40, 41.

Reference is now made to Figure 4a of the drawings which shows the production of the blanks from which the packs are to be formed. A reel of a web of material from which the packs are to be formed is indicated at 130. The material may be a relatively heavy grade paper or a soft card. For example a paper weight in the range 20 to 25 gsm may be used although 80 to 200 gsm is preferred. Food grade papers can be used including both

coated (single or double-sided), uncoated papers and natural papers are suitable as are recycled papers. The reel is mounted on a roller 131 to enable the web to be unrolled and fed to a plurality of stations where different treatments are carried out on the web.

In the first operation the web 132 passes between several (e.g. seven) pairs of upper and lower rollers 133 which apply print colours and varnishes. The upper rollers are print or varnish applying rollers and the lower rollers support the web from below in the region where it is engaged by the upper rollers. Initial upper rollers print text and graphical information on the upper surface of the web and subsequent rollers apply a coating or coatings of varnish to protect the print. The web then passes between upper and lower cutter rollers 134, 135 on which there are cutting blades designed to form continuous lines of cut, intermittent lines of cut (perforation lines) or lines of partial cut (cutting only part way through the substrate). Partial cuts or perforation cut lines are made through the web where the subsequent blank is to be folded between adjacent walls of the blank or between adjacent tabs and walls of the blank. This is described in greater detail below with reference to Fig. 5. The cutters on the roller 135 also form the window 9 in the lid 8 by forming a continuous cut in the required window shape and then removing the cut out portion of web to form a window. The window cut out portions are usually relatively large, by design, as they are easy to handle as they are removed.

A web of thin plastics transparent film 136 is fed from a roll 137. Adhesive is applied to either the back of the web 132 or the face of the film 136 and film brought into contact with the reverse surface of the web 132 to overlie the web. The film is pressed against the web between upper and lower rolls 138 and 139 to laminate the film to the paper web. The rolls are followed by a dryer 140. The transparent film may be any clear film or multi-film laminate, such as, but not exclusive to, polylactic acid (cellulose), PP (polypropylene - BOPP), PET (Polyethyleneterephthalate – Polyester), or PE (polyethylene - OPP). It will be understood that forming the various lines of cut including those for the window before the laminating of the transparent film to the web avoids the risk of inadvertently slitting the film when cutting the web, by attempting to cut the board or paper after lamination, without cutting the film.

At this point the web can be passed to the end of the machine and rewound to produce a reel. A reel of the thus formed laminated web can be transported to a further apparatus for completing the blanks.

However, in the process for producing cut blanks the web 132 then passes to a further pair of cutter rollers 141, 142 having shaped cutters to cut a folded blank 143 (as discussed below with reference to Fig. 6) from the web to separate the blank which can be erected into a pack form as shown in Figures 1 to 3.

The remainder of the web, left behind when the blanks are cut out, needs to be removed from the machine and so is taken up and either fed directly into a waste system or reeled into a waste reel 144. The carton blanks are collated at the end of the machine 145 ready for stacking and transferring to the next process.

The first cut performed by the rollers 134, 135 is shown in Fig. 5. For the purposes of illustration, the reference numerals of Fig. 1 have been introduced at the appropriate place in Fig. 5 to designate the various faces of the blank even though these are not yet fully formed in this Figure. These simply represent the regions of the blank where the various features will be formed following the final cut described below.

As shown in Fig. 5, a number of fold lines are formed by partially cutting the web. These include the fold flat line 6, the score lines at the shorter edges 3, 4, the score lines on the opposite side of the second 12 and third 16 faces, the score line along the edge 5 between the first face 1 and the lid 8, score line 50 to form a fold line at the bottom edge of the third face 16, and a score line to form the fold flat line 23 on the second panel 22. The cuts may be partially through the web and/or may be discontinuous to form a line of weakness to create a fold. They do not fully cut all of the material in any of these lines.

A number of full cuts are made, namely cuts which are not intermediate and extend through the full depth of the web. These are a cut 51 to form the window 9, a cut 52 as the first cut in a web portion 53 in the vicinity of the web 19 as described in greater detail below and a cut 54 to form a web portion 55 in the vicinity of the web 44 as described below.

A number of additional through cuts 58 are also made at this stage. These are short cuts which penetrate fully through the web. In the finished blank, these ensure that the web material of adjacent flanges can easily be separated when the flanges are folded out. This is described in greater detail below.

The final cut performed by the cutting rollers 141, 142 is shown in Fig. 6. This is the cut which releases the blank from the web and therefore extends fully around the perimeter of the blank and all the way through the web of flexible material and the film except in the regions of the web portions 53 and 55 as described below. Additional cuts are made at this stage including a cut 62 to form a tab 18. Two U-shaped cuts 63 are made at junctions between adjacent flanges as described below.

As a result of the cutting and laminating processes, the finished blank before it is removed from the web is as shown in Fig. 7.

The cutting process in the first web portion 53 will now be described with reference to Figs. 8 and 9. The process is the same for the second web portion 55, albeit with a different shape and this will not be described separately.

In the rollers 134, 135, the first cut 52, 53 is made through the web 132. This cut forms the edge of the web in a corner of the finished blank. This process is shown in Fig. 9A. In Fig. 9B, the laminate has been formed by the addition of the film 136. This has been printed with adhesive as described above in every region except for region 70 which is devoid of adhesive. This non-adhesive region 70 corresponds to the footprint of the web portion outlined by 52, 53 and 64, and is shown shaded in Fig. 8. In the second cutting step, as mentioned above, most of the perimeter of the blank is formed by a cut line 60 through the full depth of the laminate. However, in the vicinity of the web portions 52, 53 and 54, two partial second cut 64 and 65 respectively are formed as shown in Fig. 9C. This extends fully through the film layer 136 and also extends partially into the web 132. It is not necessary for this cut to extend into the web, but as a matter of practicality, it is useful that it does as this creates a more reliable cut of the film 136. The important thing is that the cut 52 does not extend fully through the web 132. As shown in Fig. 9D, this allows the portion 72 of the web 132 which is beneath the film web 136 to be removed together with the waste matrix 73 shown on the right hand side of Fig. 9D. As shown in Fig. 7, the cuts 52 and 54 extend slightly beyond the outline cut 60, this is to ensure that there is no gap between the cuts 52, 54 and the outline cut 60 to ensure that the blank is fully severed. In the case of the cut 52, as can be seen in Fig. 7, this extends partly into the waste matrix 73 and slightly into the tab 18 whereas the cuts 52, 53, 54 extend into the waste matrix 73 such that neither cut unduly affects the finished product.

Once the blank has been removed and is in the form shown in Fig. 1, it is folded to make the partially assembled pack. This is shown schematically in Fig. 4b. Blanks 145 are taken from the stack and passed through a succession of stations including a folding station 150 in which the tab 18 is folded inwardly and the overlapping portion 31 is folded inwardly along the fold flat line 23. The blank then moves to a gluing station 151 where glue guns apply adhesive to the tab 18 and the overlapping region 31. The blank then moves to a folding station 152 where the blank is folded in half such that the second face 12 adheres to the tab 18 and the first panel 21 is adhered to the overlapping portion 31 to form the finished blank as described with reference to Fig. 2.

At a first corner 146 of the blank which is at the junction between the third face 16, second panel 22 and tab 18, these three components are folded downwardly in relation to Fig. 1 (in which the film 132 is on the lower face). This has the effect of bringing these three parts 16, 22 and 18 into a mutually orthogonal position in which the corner 146 is now occupied by the film web 19 which by now has crumpled as its sides are effectively brought closer together by the folding operation. The exact form of this crumpled material is impossible to control in practice and its form will vary between each pack. However, it does mean that there is no direct pin hole at corner 146 as previously. The tab 18 is then adhered to the second face 12 as this is folded in and a second corner 147 between the second face 12 and first panel 21 and folded into a position such that it coincides with the first corner 146. In this position, the overlapping portion 31 is adhered to the first panel 21. This is not sufficient to guarantee a hermetic seal in the coinciding first and second corners 146 and 147 but it does at least serve to create a tortuous passageway around the web 19 which is far more effective at reducing the gas flow into the pack than the previous pin hole.

The film web 44 adjacent to the flange portion is formed in the same manner as described above. This is able to seal the gap 45 between the flange portions 40, 41 when the lid is closed. Since this flap of film runs along the heat seal area of the flange, it is sealed, along with the lid, and forms a near hermetic seal at this point in the pack, where there would normally be a small hole in packs without this flap of film.

The U-shaped cuts 63 between the flanges 13, 14 and 17, 41 together with the through cuts 58 form a region in the blank where, in the vicinity of the junction between adjacent flanges, there is a short through cut 58 which remains covered with the film as this cut was part of the first cut formed before lamination. When the flanges are folded outwardly, this

film is stretched, but only to a small degree as the length of the cut 58 and the finished blank is very short. This ensures a small stretched piece of film in the vicinity of the corner which will cover a pin hole which is otherwise formed in this location where the lid is attached to the flanges.

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The cuts 58 can be on the final cutter rather than the first cutter. This does not close the corner as effectively as when the cuts are on the first cutter, but the hole at this point will be small.

CLAIMS:

1. A planar blank that can be folded from a planar form into a three-dimensional receptacle for packaging,

the blank being formed of a laminate of a sheet of flexible material to which a sheet of film is adhered to form the laminate, the blank comprising:

a plurality of faces including a first face with a first free edge, a second face with a second free edge that meets the first free edge at a first corner, a third face between the first and second faces that is separated from the first and second faces by respective fold lines, the third face also extending to the first corner;

a fourth face with a free edge and a fifth face with a free edge, the free edges of the fourth and fifth faces meeting at a second corner that is separate from the first corner in the blank, but which coincides with the first corner in the receptacle;

wherein a web of unsupported film extends between the first and second faces in the vicinity of the first corner, the film being positioned such that it is crumpled when the first and second free edges are brought towards one another to form the receptacle and being attachable to at least one of the fourth or fifth faces in the receptacle, such that the crumpled film formed a non-hermetically sealed gas barrier in the coinciding first and second corners.

2. A three-dimensional receptacle for packaging formed from a planar blank according to claim 1.

3. A method of forming a receptacle for packaging comprising forming a blank according to claim 1 and folding it to create the receptacle.

4. A method of creating a blank that can be folded from a planar form into a three dimensional receptacle for packaging, the method comprising:

feeding a sheet of flexible material to a first die and performing a cutting step on the die to form a first set of cuts for each blank in the web, the first set of cuts including at least one through cut in the material which will define, in the finished blank, part of an edge of the flexible material, and wherein the area on the opposite side of the cut line to the finished blank is defined as a web region;

feeding the sheet of flexible material with the first set of cuts to a laminating station;

selectively applying adhesive to a sheet of flexible film and adhering it to the sheet of flexible material and the laminating station to form a laminate such that there is at least one region of flexible film in the web region in which the film is not adhered to the flexible material;

and feeding the laminate to a second die to perform an outline cut from the film side, the outline cut passing through the full depth of the laminate other than at the web regions, the outline cut meeting the through cut in the material at each respective web region, the outline cut passing through the film but not fully through the card on the side of each respective web region which is opposite to the through cut in the material, thereby severing the blank from the laminate without leaving any unconnected flexible material or film and, in the web regions, leaving a film material unsupported by the flexible material.

5. A method of claim 4 for providing a blank according to claim 1.

6. A planar blank that can be folded from a planar form into a three-dimensional receptacle for packaging;

the blank being formed of a laminate of a sheet of flexible material to which a sheet of film is adhered to form the laminate;

the blank comprising a plurality of faces to make up the body of the receptacle, the faces being foldable together to form an opening through which the receptacle can filled;

a plurality of the faces each being provided with a respective flange portion connected to the respective face by a fold line, such that, when the receptacle is assembled, the flange portions are out-turned to at least partially surround the opening such that the film is presented at the outwardly facing face of the flange to provide a surface to which a lid can be attached;

at least two of the flange portions being adjacent to one another in the blank at a corner between adjacent faces, a U-shaped cut-out being formed from the outer edge of the blank, across the interface between the two flange portions and extending for at least half of the depth of shallower of the two flanges; and

a cut line in the flexible material but not the film extending from the base of the U-shaped cut-out to the corner, the film which covers the cut line being configured to stretch when the flanges are out-turned.

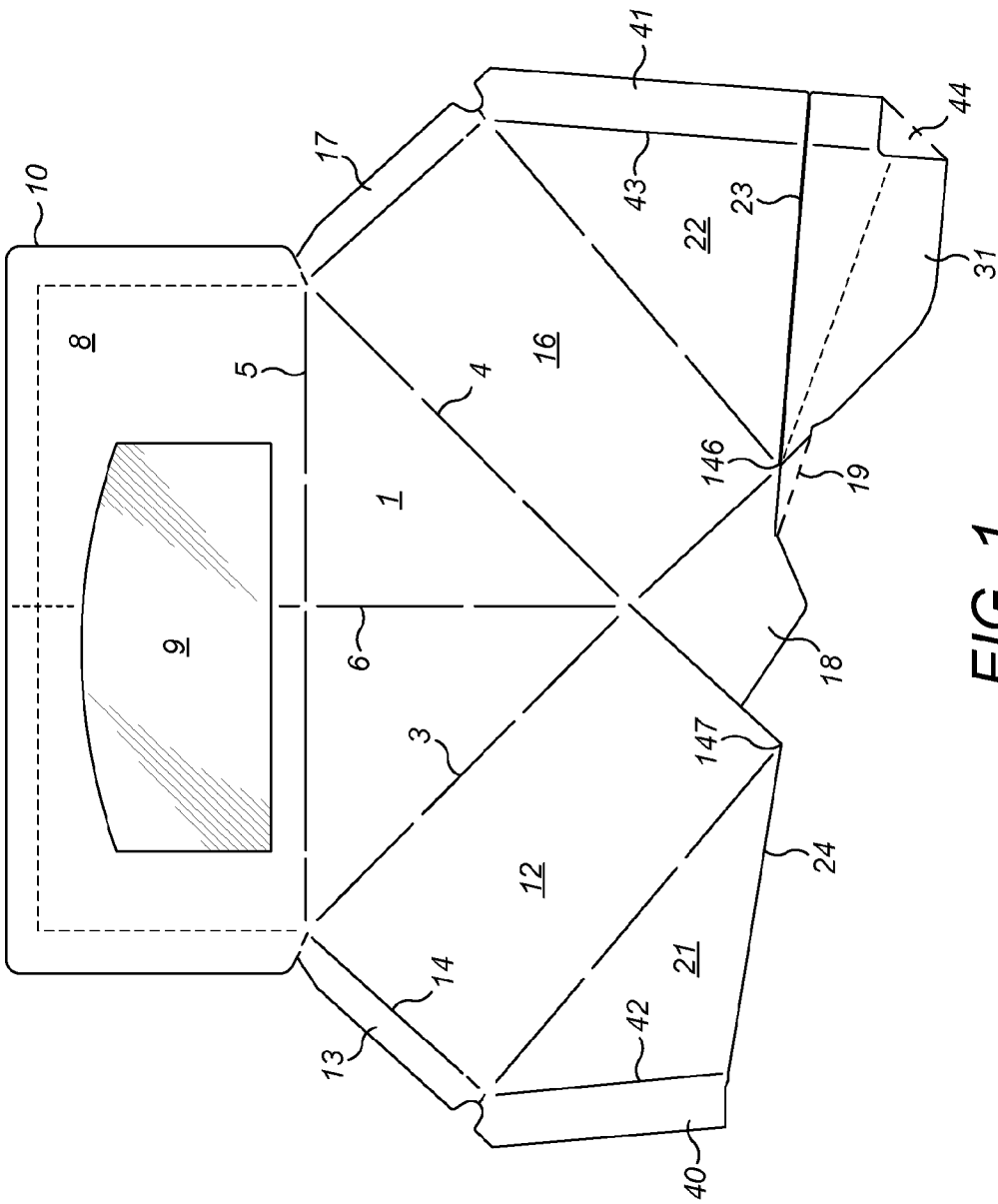

FIG. 1

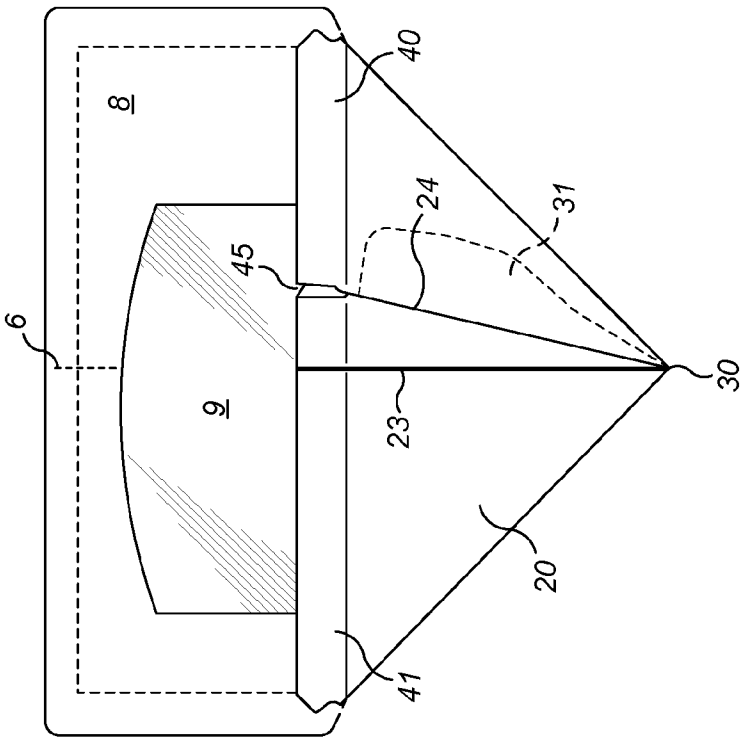

FIG. 3

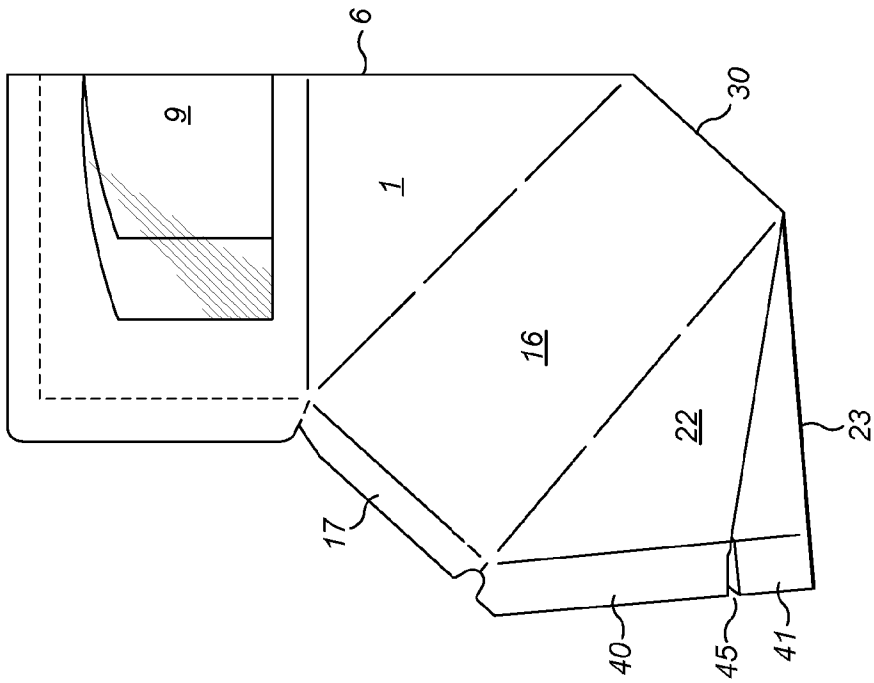

FIG. 2

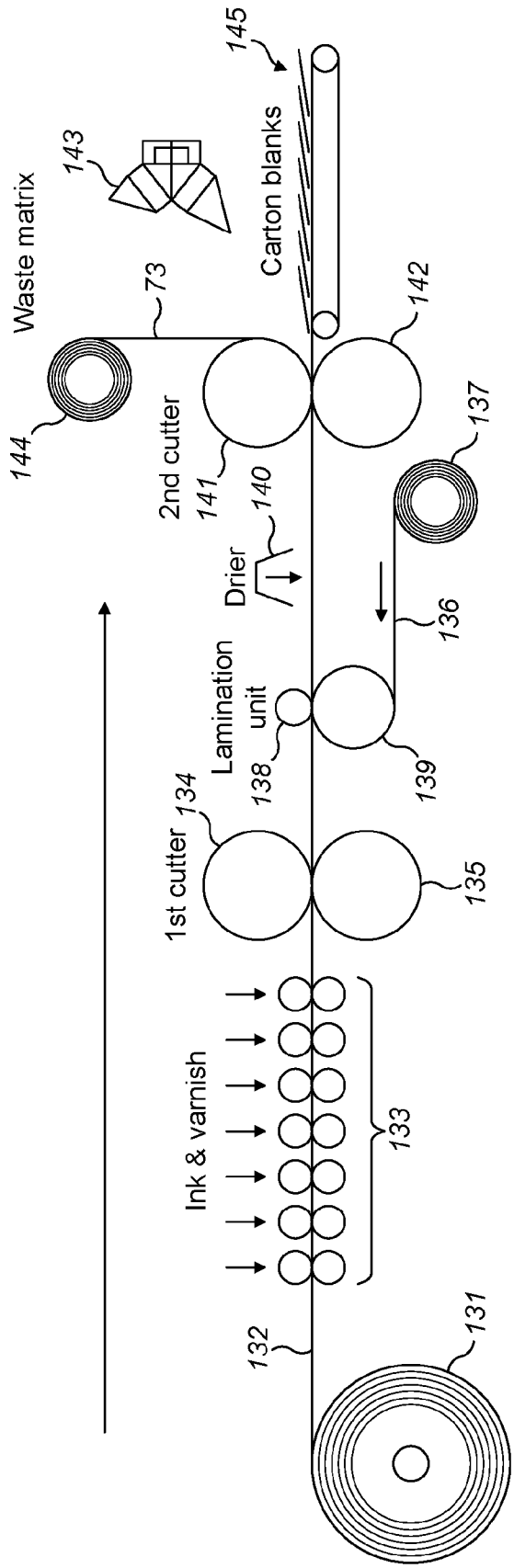
145
143
Waste matrix
Carton blanks
73
142
144
2nd cutter
141
140
137
Drier
136
Lamination
unit
138
139
134
1st cutter
135
Ink & varnish
133
132
131

FIG. 4a

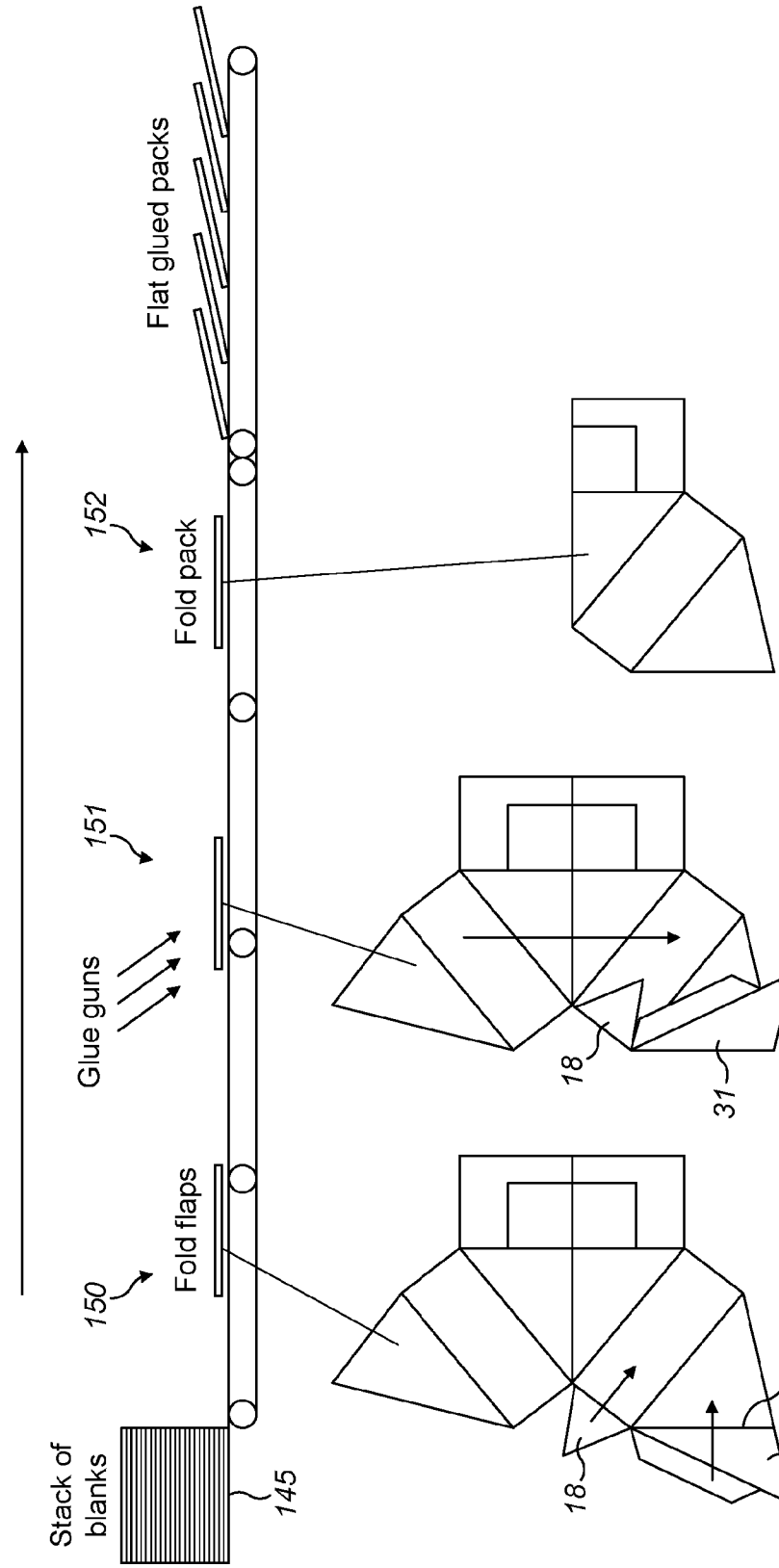
Flat glued packs
152
Fold pack
151
Glue guns
150
Fold flaps
Stack of blanks
145
18
31
23

FIG. 4b

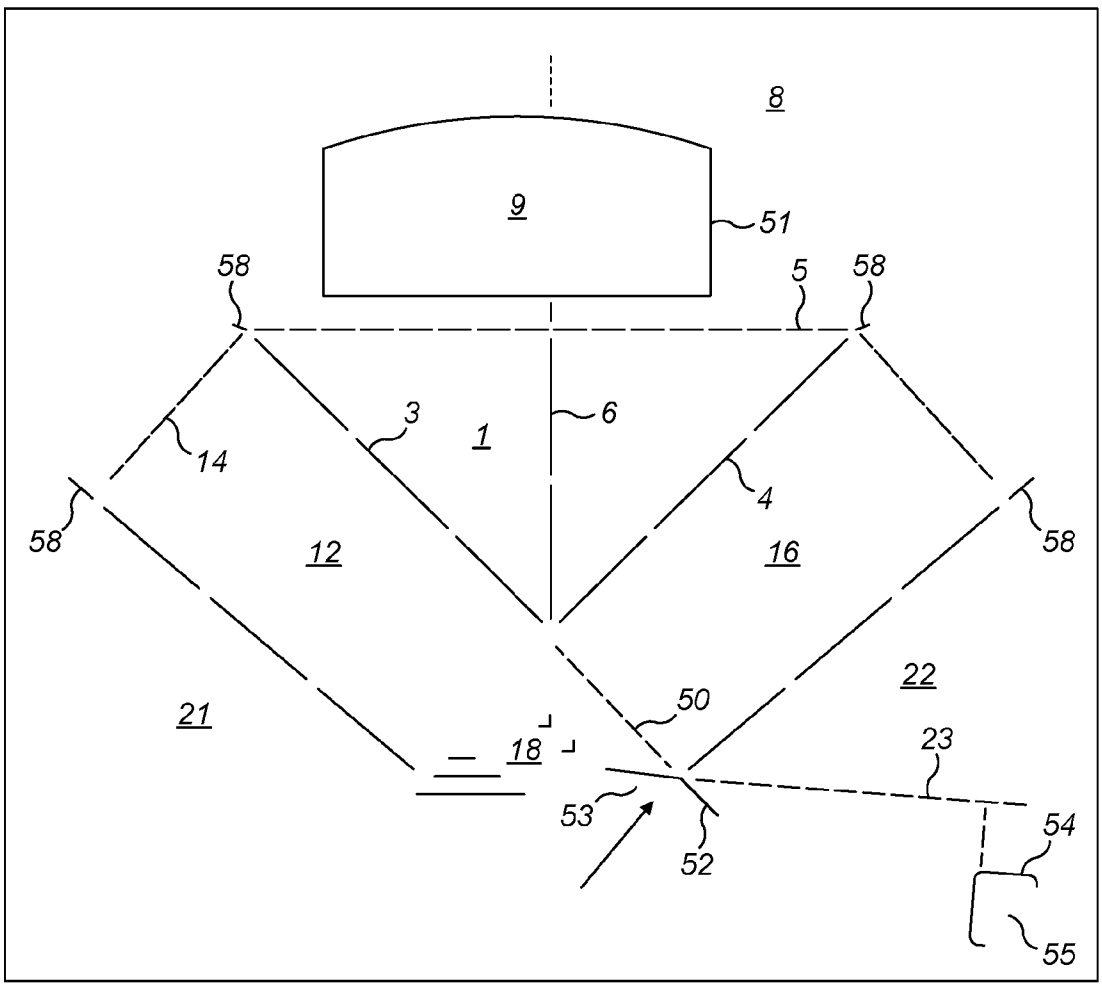

FIG. 5

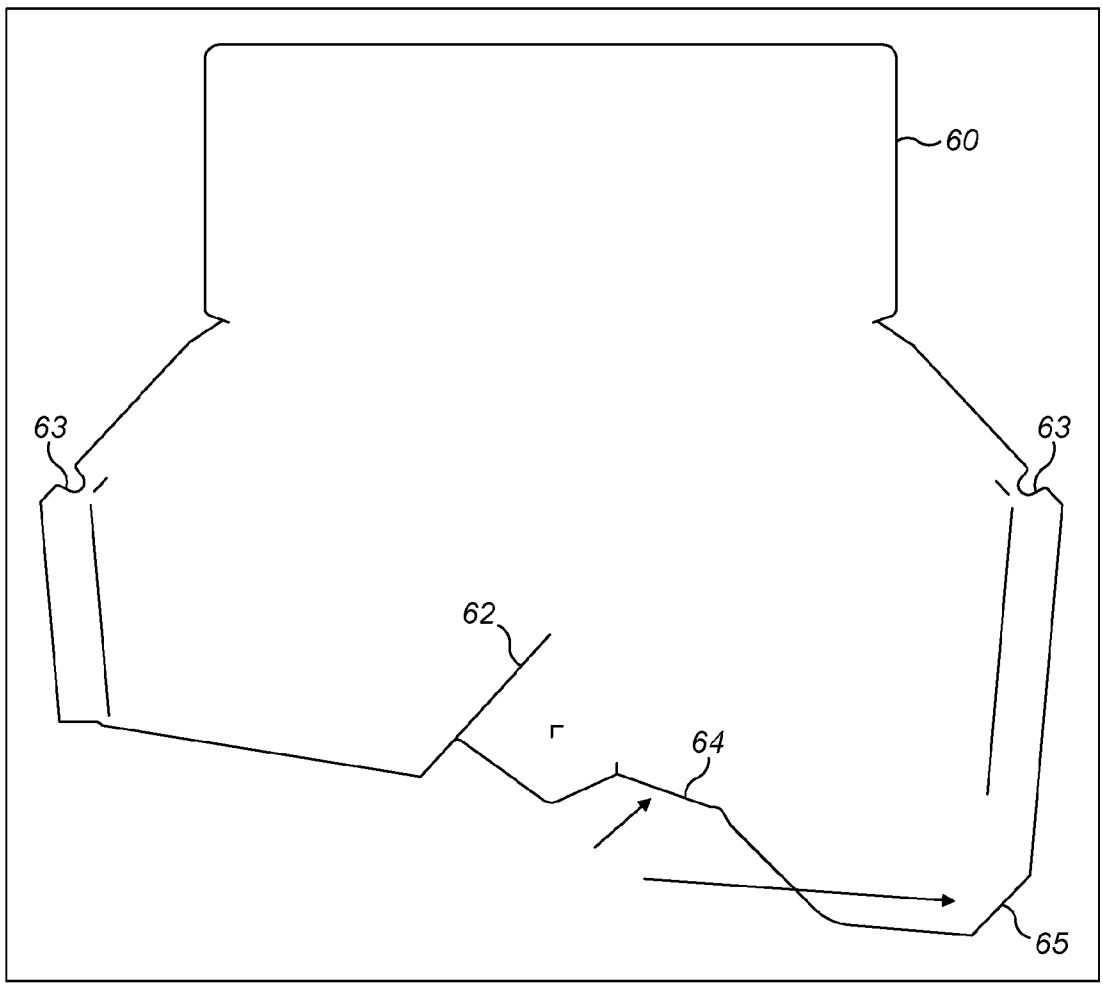

FIG. 6

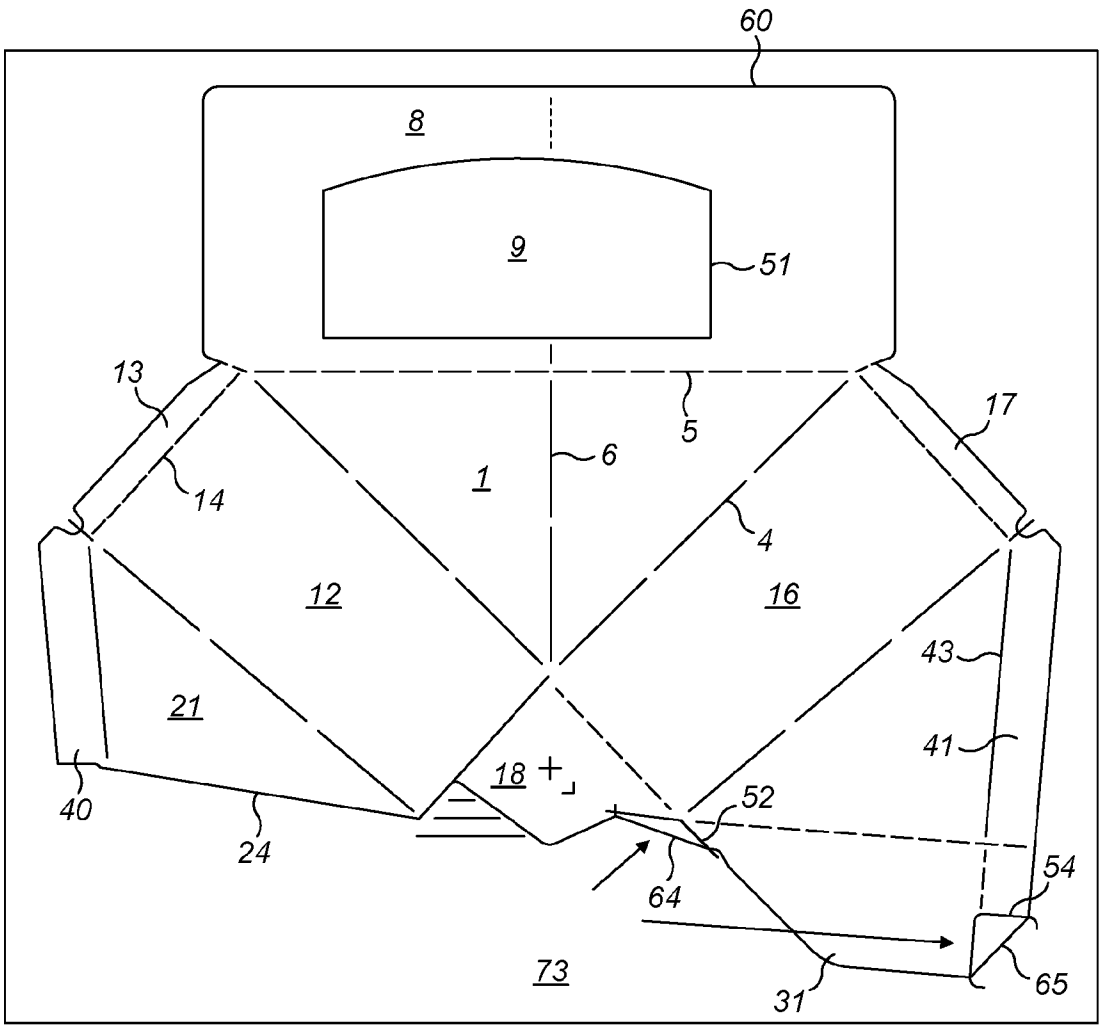

FIG. 7

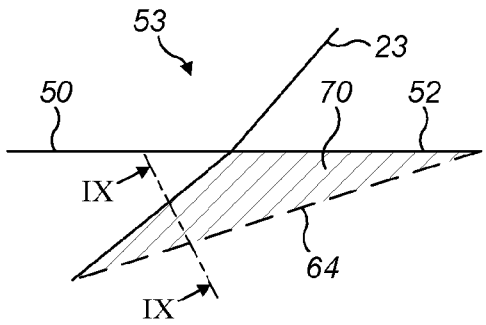

FIG. 8

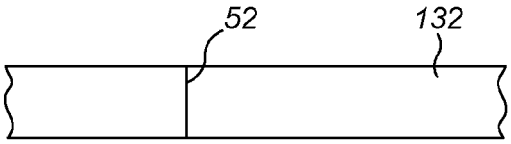

FIG. 9A

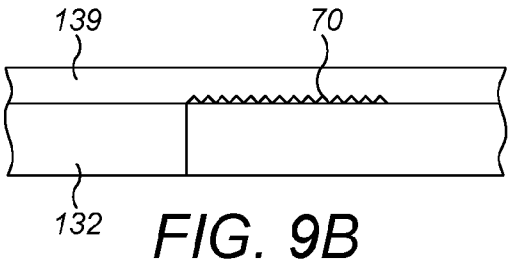

FIG. 9B

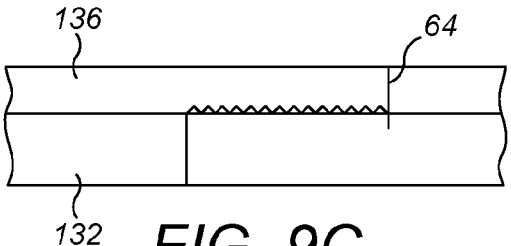

FIG. 9C

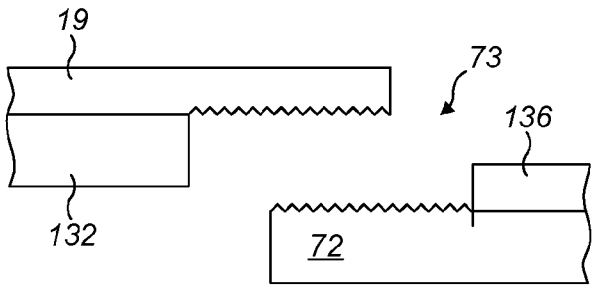

FIG. 9D