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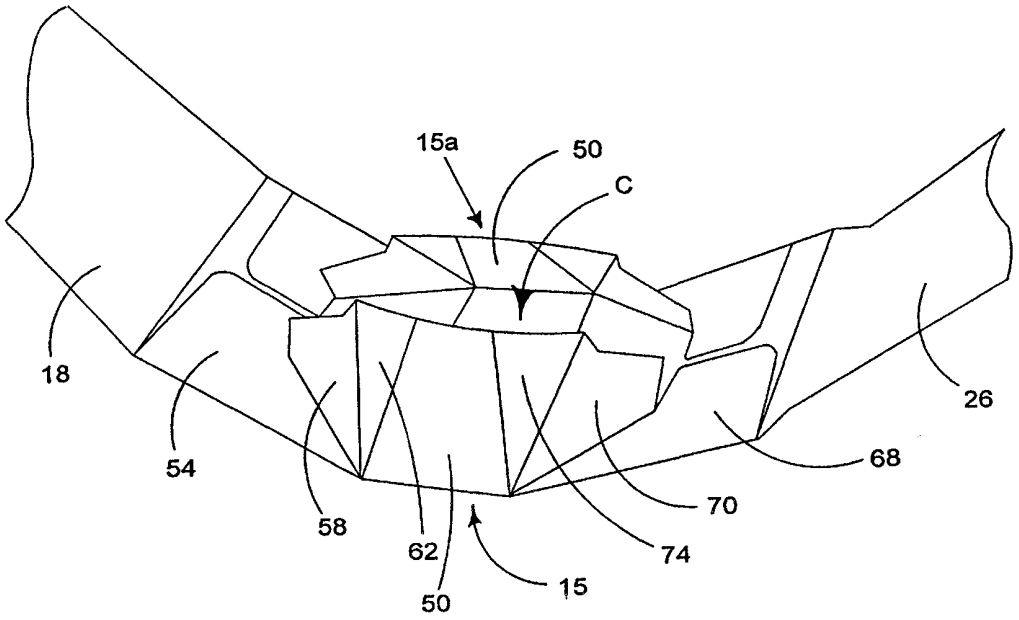

(57) Abstract

A band and a blank for forming a band for encircling one or more articles, for example poultry or meat. The band is formed from paperboard or like foldable material and comprises an endless strap and a compartment for retaining part of the article. The compartment can be erected from a flat collapsed condition into a position of use, and is formed by the strap and opposed end wall structures hingedly connected to the strap in face contacting relationship. The opposed end wall structures are so constructed and arranged to be automatically erected from the flat collapsed condition into the position of use during construction of the carton.

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PRODUCT ENCIRCLING BAND AND CARTON

Background of the Invention

The present invention relates to a carton or product encircling band for accommodating foodstuff, for example poultry or meat, and more particularly to a carton formed from one or more blanks of paperboard or other suitable foldable sheet material.

Cartons or trays for shipping and displaying dressed poultry for sale are known, for example US 4 173 655, and product encircling bands are also known: one example of a product encircling band is shown in US 3 127 090.

However, such product encircling bands do not properly retain articles to prevent unintended removal.

Tray structures formed from board generally lack strength when compared with trays formed from plastics material, so more commonly trays are formed from polystyrene or other plastics material and the food stuff is protected by a plastic film. Trays are commonly of a unitary size, which can cause product to move within the tray. Furthermore, trays often have a large "footprint" in relation to the size of article to be packaged. Therefore, space is often wasted during storage and delivery of the foodstuff.

The present invention, and its preferred embodiments, seek to overcome or at least mitigate the problems of the prior art.

Summary of the Invention

One aspect of the invention provides a band for encircling one or more articles, for example poultry or meat, which band comprising an endless strap and a compartment for retaining part of the article(s). The compartment is formed by the strap and opposed end wall structures hingedly connected to the strap. Preferably, each end wall structure comprises one or more

engagement flaps adapted to be folded inwardly wherein the compartment is erected by encircling the article with the strap and placing the or each engagement flap intermediate the article and the strap.

According to an optional feature of this aspect of the invention the compartment may be erected from a flap collapsed condition into a position of use and the opposed end wall structures may be foldably connected to the strap in face contacting relationship, which opposed end wall structures are so constructed and arranged to be automatically erected from the flat collapsed condition into the position of use during construction of the carton.

According to another optional feature of this aspect of the invention the or each engagement flap may be secured to the strap. Preferably, the or each flap may be secured to the strap prior to erection of the compartment.

According to another optional feature of this aspect of the invention each end wall structure may comprise an end panel, opposed web panels hingedly connected to the lateral edges of the end panel, the web panels and the end panels may be adapted to be folded upwardly and outwardly with respect to the strap to form the compartment.

According to a further optional feature of this aspect of the invention each end wall structure may comprise an end panel, opposed web panels hingedly connected to the side edges of the end panel, the web panels and the end panels being adapted to be folded upwardly and inwardly with respect to the strap to form the compartment.

According to a still further optional feature of this aspect of the invention each web panel may hingedly interconnect the engagement flap and the end panel by a pair of divergent fold lines to define a substantially triangular web panel.

A second aspect of the invention provides a blank for forming a band for encircling one or more articles, for example, poultry, which blank comprises a strap panel and an end wall structure comprising a pair of end panels hingedly connected to opposed side edges of part of

the strap panel. The end panels are connected along each of their side edges to a web panel and an engagement flap, which engagement flaps are hingedly connected to the side edges of the strap panel. The engagement flap and the web panel are so constructed and arranged to cause each end panel to move from the flat collapsed condition to a set up condition during carton construction.

A third aspect of the invention provides a carton for holding a plurality of articles, for example bottles, comprising a top, a base, opposed side walls foldably interconnecting the top and the base and an end wall structure, wherein the end wall structure comprises an end panel, opposed web panels foldably connected to the side edges of the end panel and secured to the inner faces of the opposed side walls by glue flaps, wherein the end wall structure is automatically erected when the carton is constructed. Preferably, the web panels and end panel are adapted to be automatically folded in an upward and outward direction with respect to the base when the opposed side panels are folded inwardly towards each other during carton set up.

A fourth aspect of the invention provides a blank for forming a carton having a frangible connection permitting the separation of two pieces of paperboard or similar material, the pieces defining opposed side edges. The connection may be torn from a starting point at the intersection of the connection with either side edge, the connection comprising a plurality of perforations arranged in a non-linear configuration. Preferably, the perforations may be arranged in a saw-tooth configuration, and each perforation may extend from the apex of each tooth and terminate at a point short of the adjacent opposing tooth.

According to an optional feature of the fourth aspect of the invention cut-away portions may be provided at the point of intersection of the connection and the side edges to direct the tearing along the frangible connection.

Brief Description of the Drawings

Exemplary embodiments of the invention may now be described, by way of example only, with reference to the accompanying drawings in which:

FIGURE 1 illustrates a blank according to one embodiment of the invention;

FIGURE 2 is a plan view of the blank of Figure 1 in a part folded and glued condition;

FIGURES 3 and 4 illustrate the blank of Figure 1 during construction of the compartment without the use of glue;

FIGURE 5 illustrates the carton constructed from the blank of Figure 1 in a set-up and loaded condition.

FIGURE 6 illustrates a blank according to a second embodiment of the invention;

FIGURE 7 illustrates the blank of Figure 6 during construction of the compartment; and

FIGURES 8a and 8b illustrate the carton constructed from the blank shown in Figure 6 in a set up and loaded condition.

Detailed Description of the Preferred Embodiments

Referring to the drawings and, in particular Figure 1, there is shown a blank for forming a carton or product encircling band made from one or more blanks of paperboard or similar foldable sheet material.

The blank 10 comprises an elongate strap 12, and panels for forming a compartment C (Figure 4). In this embodiment, the strap 12 comprises, in series, a glue flap 14, a first strap panel 16, a second strap panel 18 hingedly connected together in a series by fold lines 20 and 22. The second strap panel 18 extends from one end of the panels forming the compartment structure C and is hingedly connected thereto along fold line 24. There may further comprise a third strap panel 26 extending from the opposing side of the compartment structure panels

and hingedly connected thereto along fold line 28. The first, second and third strap panels 16, 18, 26 are substantially co-planar, in this embodiment.

There may further comprise a fold region, provided by a plurality of panels 30 hingedly connected together by a series of crease lines 32, to assist in folding the strap, so as to better conform to the shape of the article A held within the carton. In other embodiments, there may comprise other fold regions formed along the strap, according to the shape of the article to be packaged.

The strap 12 may further comprise one or more flaps 19 which extend outwardly from their longitudinal edges and are foldable out of alignment with the strap 12 along arched fold lines 21 to conform to the shape of the article and thereby to reduce lateral movement of the strap relative to the article.

Figure 1 illustrates the panels for forming the compartment structure C (Figure 4) comprising side panel 36, base panel 38, and second side panel 40 hingedly connected together in series along fold lines 42, 44. In this embodiment, the width of the aforementioned panels corresponds substantially to the width of the strap 12, however it is envisaged that these panels could be narrowed or broadened according to user requirements without departing from the scope of invention.

The end walls of the compartment are provided by opposed end wall structures 15, 15a that are hingedly connected to opposing side edges of base and side panels 38; 36, 40 of the compartment along fold lines 52 and 53 respectively. Each end wall structure 15 and 15a is substantially the same and therefore only one of the end wall structures 15 is described in any greater detail.

In one class of embodiments, end wall structure 15 comprises an end panel 50, a web structure hingedly connected to a lateral edge of end panel 50 along fold line 66 and an engagement flap 54 hingedly connected to web structure along fold line 60. In this embodiment, the web structure comprises a pair of gusset panels 58, 62 hingedly connected

together along fold line 64. It will be seen from Figure 1 that engagement flap 54 is hingedly connected to longitudinal edge of side panel 36 along fold line 52.

Likewise, the opposing lateral edge of end panel 50 defines a fold line 78, for hingedly connecting a second web structure thereto. The web structure comprises a pair of gusset panels 70, 74 hingedly interconnected by fold line 76. There may further comprise an engagement flap 68 hingedly connected to the opposing side wall 40 along fold line 52 and to the web panel along fold line 72. Preferably, the fold lines 60, 66 and 72, 78 are divergent from the point of intersection with the fold lines 42 and 44 respectively.

It is envisaged that other known end closure structures could be used without departing from the scope of the invention.

The construction of the band of the first embodiment shown in Figures 1 to 5, requires a series of sequential folding and gluing operations which can be performed either manually or in a straight line machine so that the carton is not required to be rotated or inverted to complete its construction. The folding process is not limited to that described below and can be altered according to particular manufacturing requirements.

The compartment of the carton of first embodiment may be constructed with or without the use of glue. In Figure 2, a method using glue is shown. The gluing positions of the blank are highlighted by hatching G, although it is envisaged that other glue positions could be adopted, if required.

Thus, the end wall structures 15, 15a are folded about fold lines 52 and 53 respectively into face contacting relationship with side panel 36, base panel 38 and side panel 40. Glue flaps 54 and 68 are secured to side panels 36 and 40 respectively by glue or other suitable means known in the art. Thus the carton is at the first stage of construction, shown in Figure 2 with the band in a flat collapsed condition. The band may optionally be supplied to the user in this condition for subsequent completion of the erection on their premises.

Referring to Figure 3, the compartment C may alternatively be erected without the use of glue. The compartment C is again usually formed at the time of applying the band to the article. The side panels 36, 40 are first folded about fold lines 42 and 44 respectively inwardly towards each other. This folding action causes the end panel 50 and the gusset panels 58, 62; 70, 74 to be folded out of alignment with engagement flaps 54, 68 along fold lines 60 and 72 respectively as shown in Figure 4. As the side panels 36, 40 continue to move inwardly, the engagement flaps 54, 68 are folded into face contacting relationship with side panels 36 and 40 respectively. The end panels 50 are automatically erected because the end panels are caused to more in an upward and outward direction to produce a set up compartment C to receive a portion of the article A.

In the embodiments of Figure 2 and Figure 3 part of the article, for example the legs of the prepared poultry are inserted into the compartment C and the band is wrapped around it such that the strap panel 18 is placed over the upper part of the chicken and the first and third strap panels 16 and 26 are folded about fold lines 22 and 28 such that they are placed in overlapping relationship with each other and are secured together by glue or other suitable means known in the art.

Thus, as shown in Figure 5, the product encircling strap is secured around the article to retain the article. The strap is held in place, because the first and third strap panels 16 and 26 are secured at a suitable position to ensure a tight fitting. Optionally, further support is provided by support panels 19 which are folded out of alignment with the strap about arched fold lines 21 to minimise lateral movement of the strap.

In the embodiment of Figure 3, the snug fitting nature of the Article A within the strap maintains the compartment C in its erected condition by holding the engagement flaps 54, 68 in a substantially face contacting relationship with the side panels 36,40 respectively.

Beneficially, the product encircling band hereinbefore described provides a structure that can be sized to the size and/or shape of the article held within it because the degree of overlap

between panels 16 and 26 can be increased for smaller articles or, conversely, decreased for larger articles.

It will be seen from Figure 5 that the panel 30 forming the fold region is applied to those areas of the strap which are required to be folded through a large angle or the shape of the article dictates that a tightly conforming strap is required.

Turning now to an alternative embodiment as disclosed in Figures 6 to 8b, similar features have, where possible, been labelled to correspond with those in the embodiment of Figures 1 to 5 but with the addition of the numeral "1".

Figure 6 illustrates a blank 110 formed from paperboard or similar foldable sheet material, which blank comprising an elongate strap 112, and panels for forming a compartment structure C. In this embodiment, the strap 112 comprises, in series, a glue flap 114, a first strap panel 116, a second strap panel 118 hingedly connected together in a series by fold lines 120 and 122. The second strap panel 118 extends from one end of the panels for forming the compartment and is hingedly connected thereto along fold line 124. There may further comprise a third strap panel 126 extending from the opposing side of the compartment structure panels and hingedly connected thereto along fold line 128. The first, second and third strap panels 116, 118, 126 are substantially co-planar in this embodiment.

There may further comprise one or more fold regions, provided by a plurality of panels 130 hingedly connected together by a series of crease lines 132, to assist in folding the strap, so as to better conform to the shape of the article A held within the strap. In other embodiments, there may comprise other fold regions formed along the strap, according to the shape of the article.

Figure 6 illustrates the panels for forming the compartment structure C (Figure 7) comprising base panel 138, a portion of second strap panel 118 and a portion of third strap panel 126 hingedly connected together in series along fold lines 124 and 128. In this embodiment, the base panel is narrower than the overall width of the strap 112 and strap panels 118 and 126

therefore narrow towards their intersection with base panel 138. However, it is envisaged that panel 138 could be broadened according to user requirements without departing from the scope of invention.

The end walls of the compartment are provided by opposed end wall structures 115, 115a that are hingedly connected to opposing side edges of base and strap panels 138, 118, 126 of the compartment along fold lines 152 and 153 respectively. Each end wall structure 115 and 115a is substantially the same and therefore only one of the end wall structures 115 is described in any greater detail.

In one class of embodiments, end wall structure 115 comprises an end panel 150, a web structure hingedly connected to a lateral edge of end panel 150 along fold line 164 and an engagement flap 154 hingedly connected to web structure along fold line 160. In this embodiment, the web structure comprises a gusset panel 158. It will be seen from Figure 6 that engagement flap 154 is hingedly connected to the longitudinal edge of second strap panel 118 along fold line 152.

Likewise, the opposing lateral edge of end panel 150 defines a fold line 176, for hingedly connecting a second web structure thereto. The web structure comprises a gusset panel 170. There may further comprise an engagement flap 168 hingedly connected to the third strap panel 126 along fold line 152 and to the gusset panel 170 along fold line 172. Preferably, the fold lines 160, 164 and 176, 172 are mutually divergent from the point of intersection with the fold lines 124 and 128 respectively.

In this embodiment, the third strap panel 126 is bisected by a frangible connection in the form of a perforated tear line 200 of saw-tooth/serrated configuration. This permits the end user to access the article A by tearing panel 126 in either direction, commencing from either edge of the third strap panel 126. This is generally more comfortable and easier to use for the end user than prior art connections which only permit tearing in one direction.

Cut-away sections 202 and 204 may be provided to direct the tearing along the frangible connection. The saw-tooth configuration substantially prevents the tear line acting as a hinge which would potentially compromise the uniformity of any curvature applied to the panel 126 when the strap is erected. In a preferred embodiment of the connection, it is provided with perforations which extend from the apex of one tooth, and terminate short of the opposed adjacent tooth.

Alternative tear line configurations may be provided, for example, sinusoidal or castellated configurations, or straight if the tear line may also act as a hinge. In alternative embodiments the tear line 200 may be located in alternative positions, for example across the second panel 118, or the first panel 116.

The construction of the band of the second embodiment is shown in Figures 7, 8a and 8b with one side of the compartment folded inwardly and requires a series of sequential folding and gluing operations which can be performed either manually or in a straight line machine so that the carton is not required to be rotated or inverted to complete its construction. The folding process is not limited to that described below and can be altered according to particular manufacturing requirements.

In one class of embodiments, the compartment structure C is formed at the time of applying the band to the article. It will be seen from Figure 7 that the engagement panels 154 and 168 are folded about fold lines 152 and 153 into substantially face contacting relationship with second and third panels 118 and 126 respectively. Due to the divergent nature of fold lines 152 and 153, this operation should be carried out once the second and third panels 118 and 126 have been folded out of alignment with the base panel 138. This may however be before or after the article A has been encircled by the strap and secured.

In the preferred formation method the engagement panels 154 and 168 are folded once the article A has been encircled by the strap, as this then allows the panels to be "tucked in" between the second and third panels 118 and 126 and the article A. This operation is aided by the protruding portions 190 and 192. As the article is encircled and secured to provide a tight

fit, the engagement panels 154 and 168 are thus prevented from moving out of face contacting relationship and the compartment is maintained in its erected state.

In other embodiments, the engagement panels 154 and 168 may be glued in face-contacting relationship to the second and third strap panels 118 and 126 respectively, prior to the securing of the band 110 to the article A as in a similar manner to the method outlined in the first embodiment. If pre-gluing is to be carried out, it is desirable that the blank is altered such that fold lines 152 and 153 are linear, thus allowing the glued blank to remain in a planar state.

With the engagement panels 154, 168 in mutual face contacting relationships, and the strap 110 wrapped around the article A, the configuration of the fold lines 160, 164, 176, 172 causes the end panel 150 to project outwardly at an acute angle with respect to the plane of the base panel 138. In this embodiment the article A is prepared poultry as shown in Figures 8a and 8b and the end panels hold the legs of the poultry against the body, and further holds the poultry within the strap.

It can be seen that in this embodiment base panel 138 is substantially narrower than base panel 38. One advantage of this configuration is that it allows a greater number of poultry to be packed together in a standard sized crate or box with their leg portions opposing each other in an adjacent overlapping relationship.

As the poultry is encircled by the strap, the second strap panel 118 is placed over the upper part of the chicken and the glue flap 114 and the third strap panel 126 are folded about fold lines 120 and 128 such that they are placed in overlapping relationship with each other and are secured together by glue or other suitable means known in the art.

Thus the product-encircling strap is secured around the article to retain the article. The strap is held in place because the glue flap 114 and the third strap panels are secured at a suitable position to ensure a tight fitting. As in the previous embodiments, the product encircling band hereinbefore described provides a structure that can be sized to the size and/or shape of

the article held within it because the degree of overlap between panels 116 and 126 can be increased for smaller articles, or conversely, decreased for larger articles.

The use of paperboard material provides an "environmentally friendly" alternative to trays formed from plastics material, and the carton or band can, advantageously, include printed matter for marketing purposes.

It will be recognised that as used herein, directional references such as "top", "base", "end", and "side" do not limit the respective panels to such orientation, but merely serve to distinguish these panels from one another. Any reference to hinged connection should not be construed as necessarily referring to a single fold line only: indeed it is envisaged that hinged connection can be formed from one or more of one of the following, a score line, a frangible line or a fold line, without departing from the scope of invention.

The present invention in its preferred embodiments relates to a carton which is shaped to provide satisfactory strength to hold the article securely but with a degree of flexibility so that the load can be transferred evenly over the band, if held. The shape of the blank minimises the amount of paperboard required. The band can be applied to one or more articles by hand or automatic machinery.

It is anticipated that particular features of each of the embodiments as described above are interchangeable and can be incorporated into cartons in the beverage field, without departing from the scope of the invention. For example, the end wall structure is applied to wraparound or end closure cartons: the end panels would be hingedly connected to a base or top panel and the glue flaps secured to the side panel.

Thus, a wraparound carton in a flat collapsed form would be provided that looks not dissimilar to the lower part of the blank shown in Figure 2. To erect the end wall structure, the side walls would be folded inwardly, by known means, to automatically erect the end wall structure. The carton would then be applied to any array of articles, for example bottles by

suitable means and the carton base panels secured together to form a wraparound carrier. Of course, this would result in a reduction in folding time for forming the carton.

CLAIMS

1. A band for encircling one or more articles, for example poultry or meat, which band comprising an endless strap and a compartment for retaining part of the article(s), the compartment formed by the strap and opposed end wall structures hingedly connected to the strap.

2. A band as claimed in claim 1 wherein each end wall structure comprising one or more engagement flaps adapted to be folded inwardly wherein the compartment is erected by encircling the article with the strap and placing the or each engagement flap intermediate the article and the strap.

3. A band as claimed in claim 1 or claim 2 wherein the compartment can be erected from a flap collapsed condition into a position of use and the opposed end wall structures are foldably connected to the strap in face contacting relationship, which opposed end wall structures are so constructed and arranged to be automatically erected from the flat collapsed condition into the position of use during construction of the carton.

4. A band as claimed in any of claims 1 to 3 wherein the or each engagement flap is secured to the strap.

5. A band as claimed in claim 4 wherein the or each flap is secured to the strap prior to erection of the compartment.

6. A band according to any of claims 2 to 5 wherein each said end wall structure comprises an end panel, opposed web panels hingedly connected to the lateral edges of the end panel, the web panels and the end panels being adapted to be folded upwardly and outwardly with respect to the strap to form the compartment.

7. A band according to any one of claims 2 to 5 wherein each said end wall structure comprises an end panel, opposed web panels hingedly connected to the side edges of the end

panel, the web panels and the end panels being adapted to be folded upwardly and inwardly with respect to the strap to form the compartment.

8. A band according to claim 6 or claim 7 when each said web panel hingedly interconnects the engagement flap and the end panel by a pair of divergent fold lines to define a substantially triangular web panel.

9. A blank for forming a band for encircling one or more articles, for example, poultry, which blank comprises a strap panel and an end wall structure comprising a pair of end panels hingedly connected to opposed side edges of part of the strap panel, which end panels are connected along each of their side edges to a web panel and an engagement flap, which engagement flaps are hingedly connected to the side edges of the strap panel, the engagement flap and the web panel are so constructed and arranged to cause each end panel to move from the flap collapsed condition to a set up condition during carton construction.

10. A carton for holding a plurality of articles, for example bottles, comprising a top, a base, opposed side walls foldably interconnecting the top and the base and an end wall structure, wherein the end wall structure comprises an end panel, opposed web panels foldably connected to the side edges of the end panel and secured to the inner faces of the opposed side walls by glue flaps, wherein the end wall structure is automatically erected when the carton is constructed.

11. A carton according to claim 10 wherein the web panels and end panel are adapted to be automatically folded in an upward and outward direction with respect to the base when the opposed side panels are folded inwardly towards each other during carton set up.

12. A blank for forming a carton having a frangible connection permitting the separation of two pieces of paperboard or similar material, the pieces defining opposed side edges, wherein the connection may be torn from a starting point at the intersection of the connection with either side edge, the connection comprising a plurality of perforations arranged in a non-linear configuration.

13. A blank as claimed in claim 12 wherein the perforations are arranged in a saw-tooth configuration, and each perforation extends from the apex of each tooth and terminates at a point short of the adjacent opposing tooth.

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14. A blank as claimed in claim 12 or claim 13 wherein cut-away portions are provided at the point of intersection of the connection and the side edges to direct the tearing along the frangible connection.

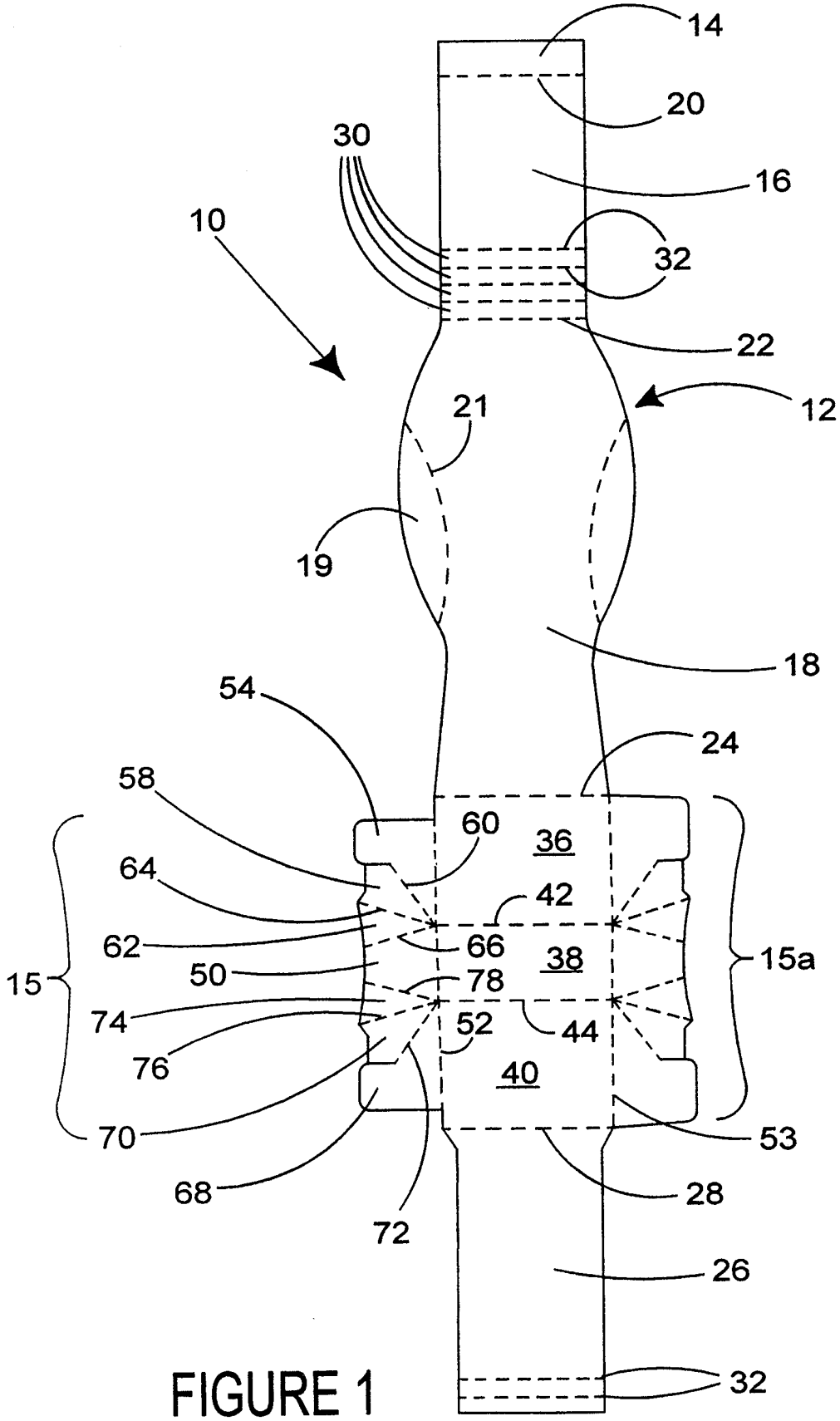
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FIGURE 1

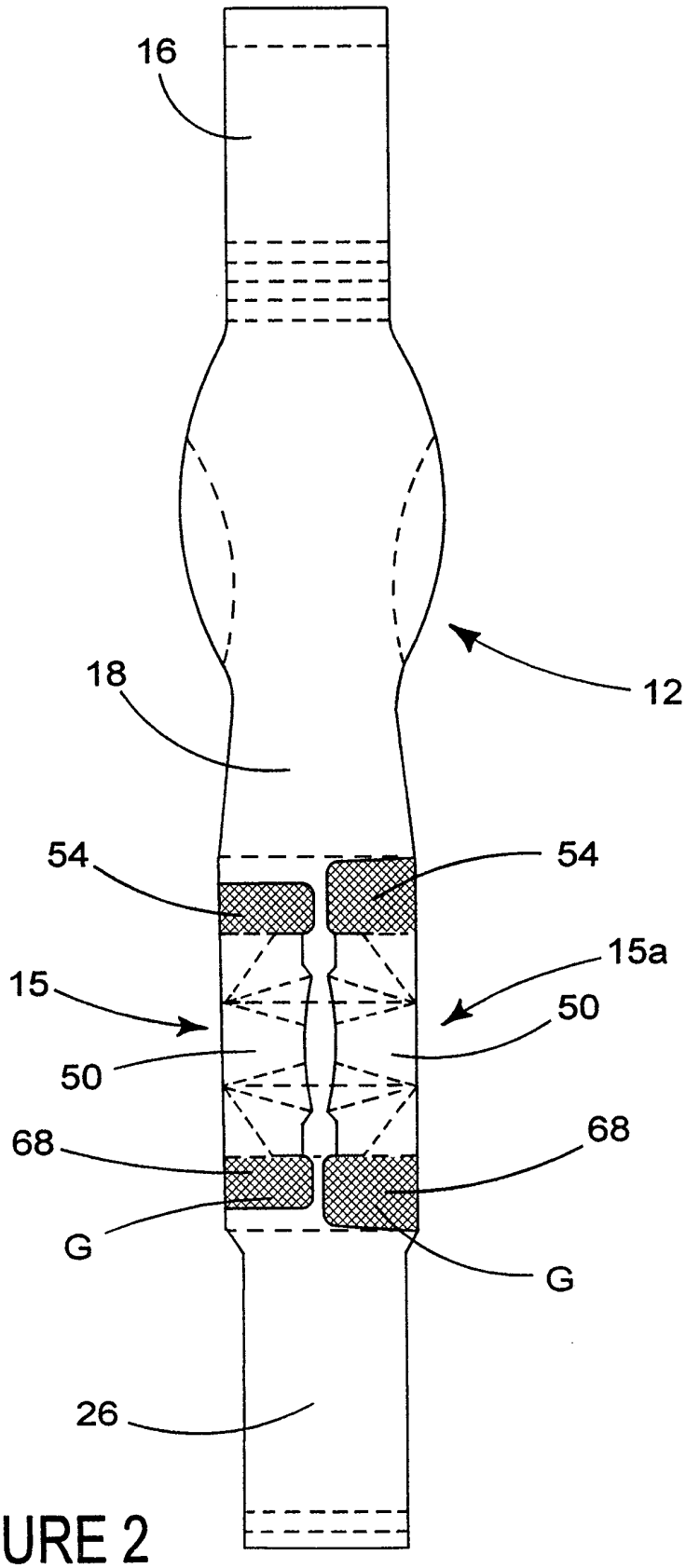

FIGURE 2

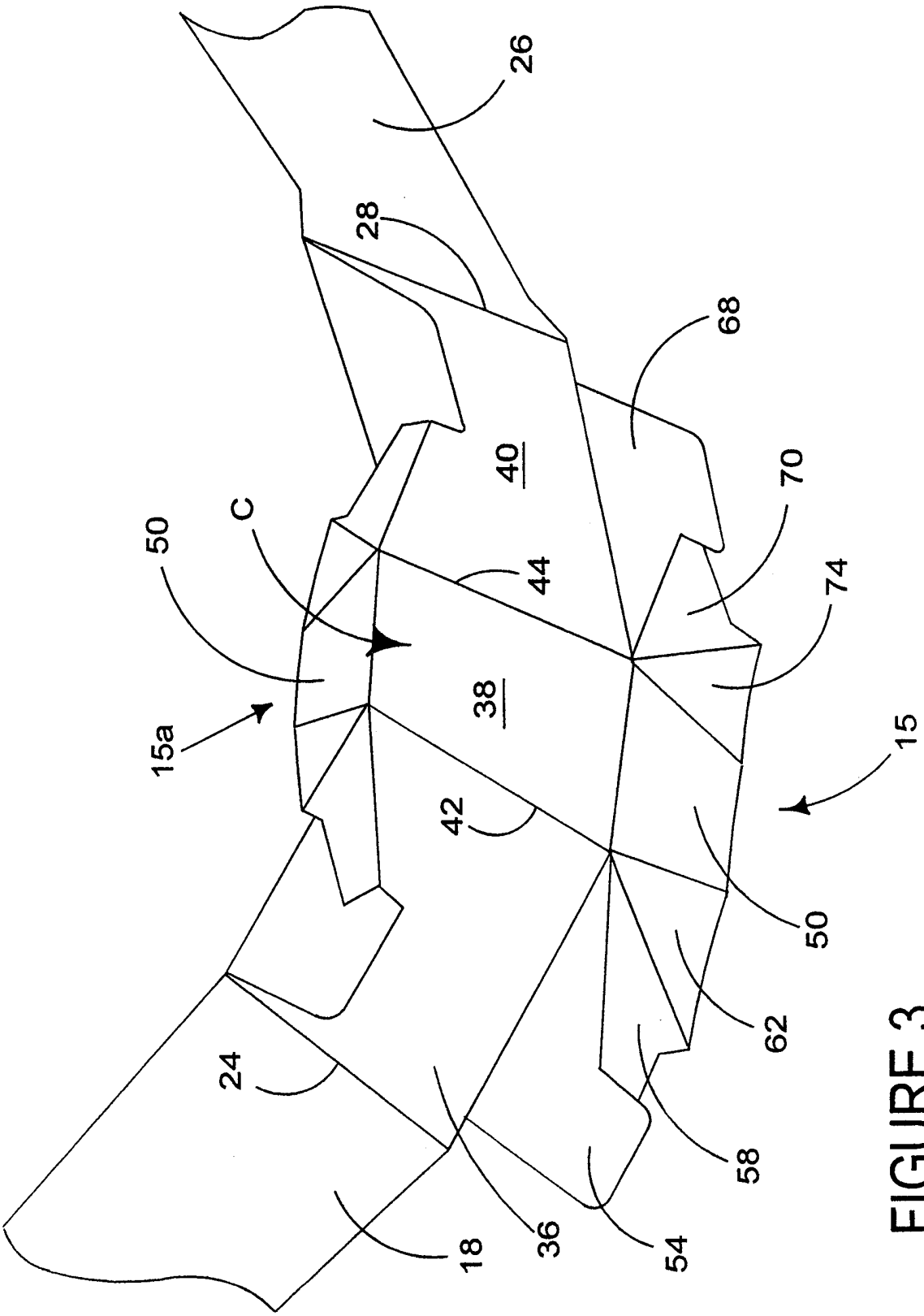

FIGURE 3

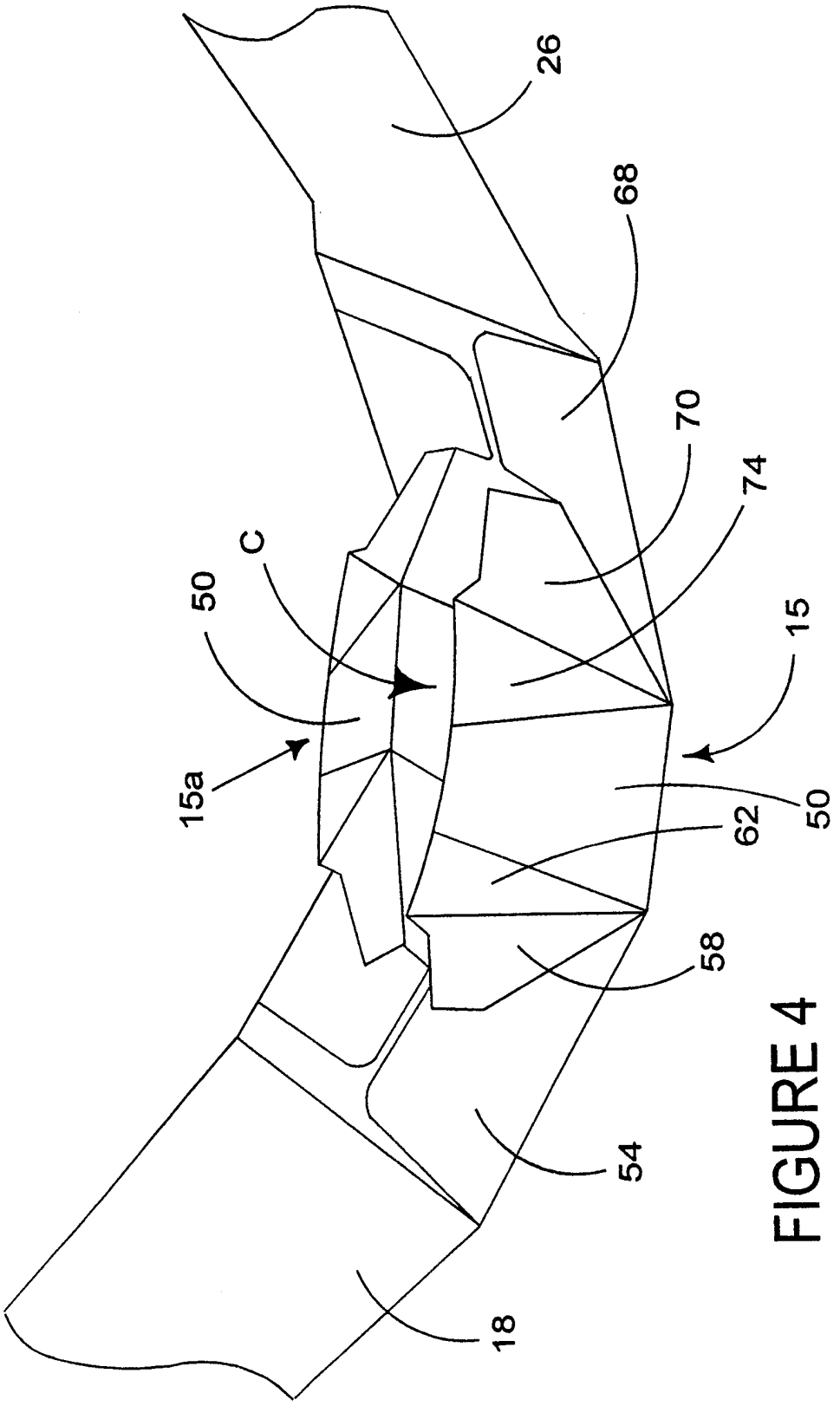

FIGURE 4

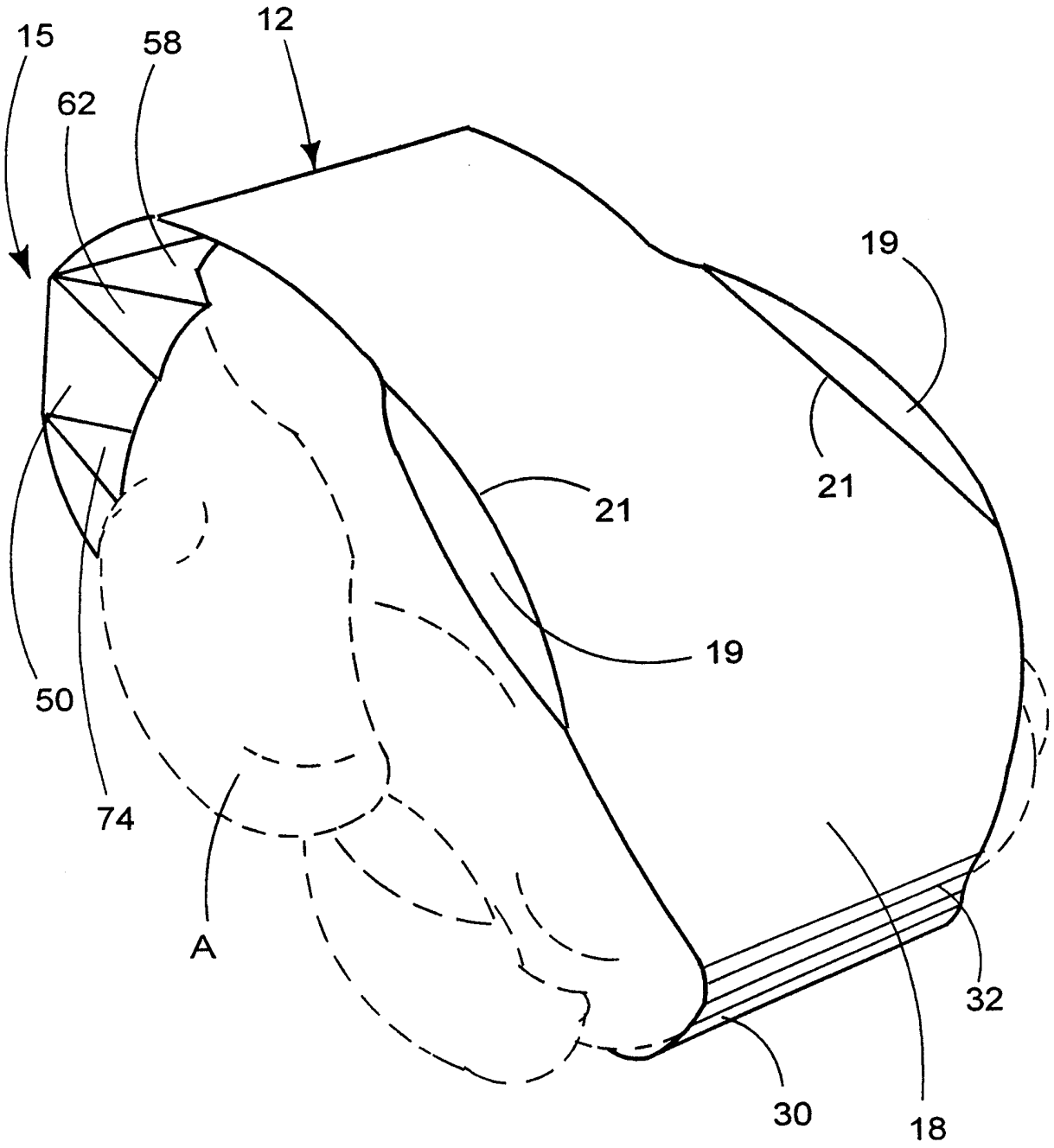

FIGURE 5

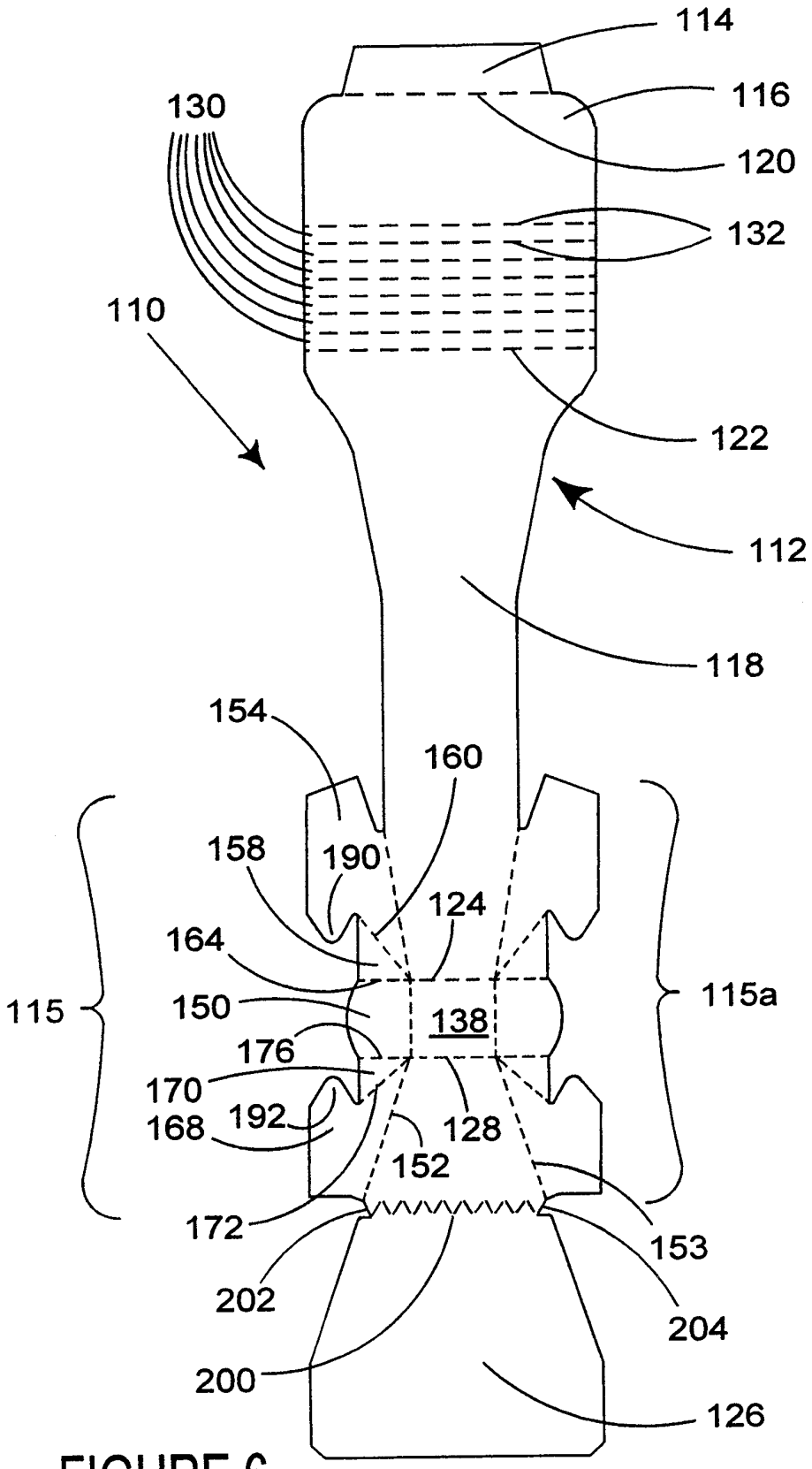
114
116
130
120
132
110
122
112
118
154
160
158
190
124
164
115
150
138
115a
176
170
192
168
128
152
172
153
202
204
200
126

FIGURE 6

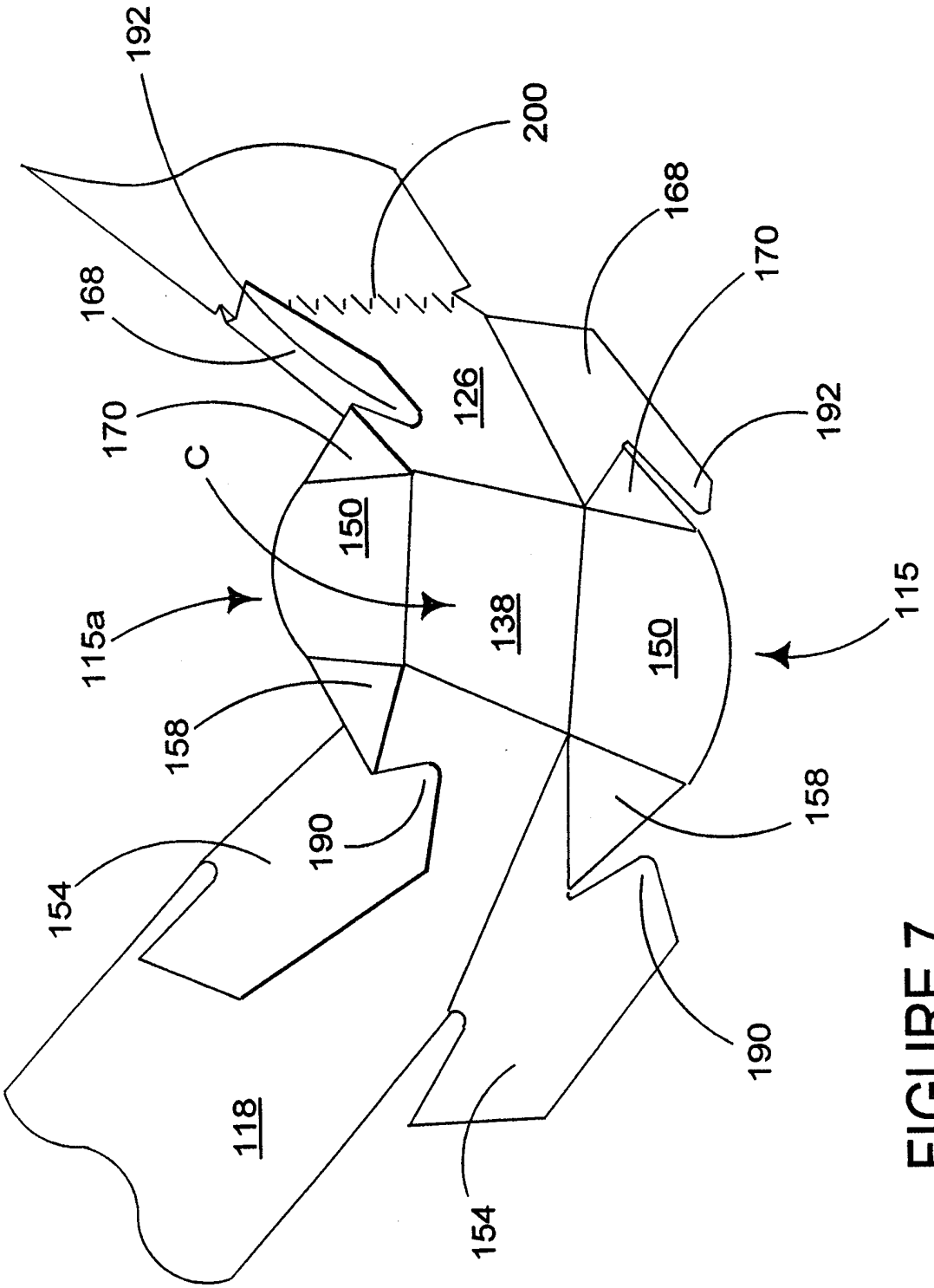
192
200
168
170
168
126
170
192
C
150
115a
138
150
115
158
158
190
154
190
118
154

FIGURE 7

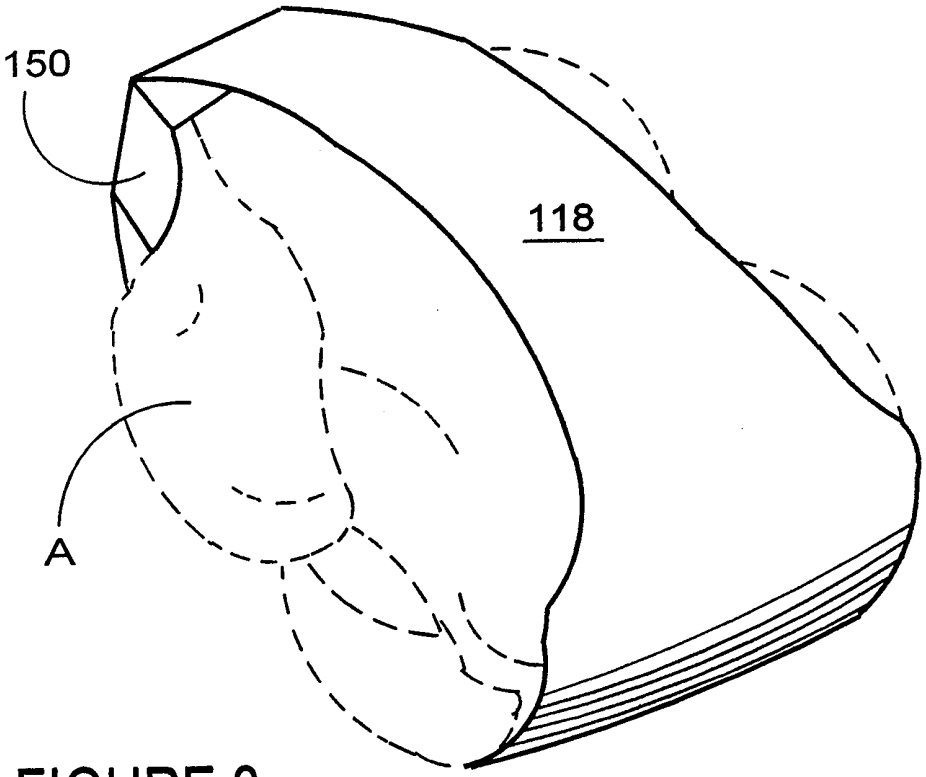

FIGURE 8a

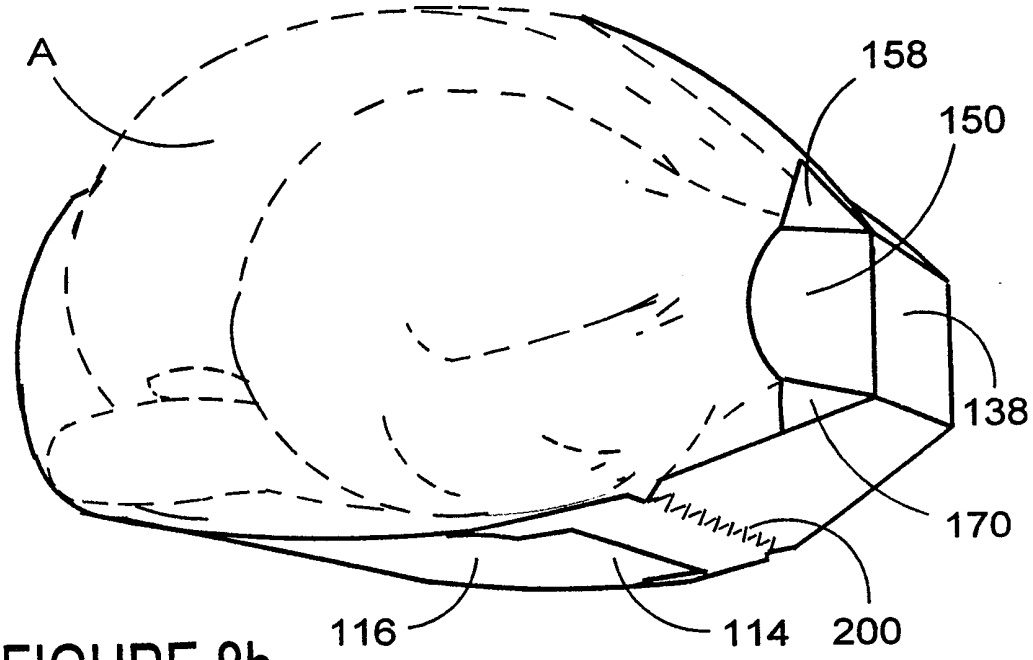

FIGURE 8b