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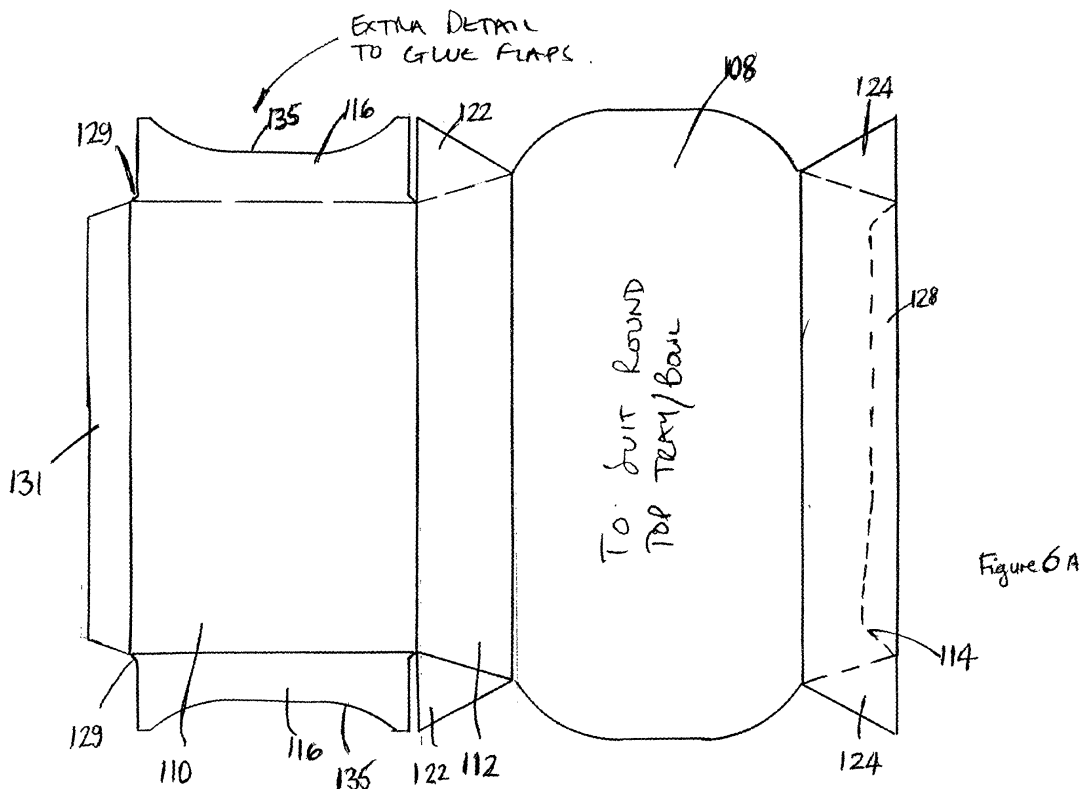
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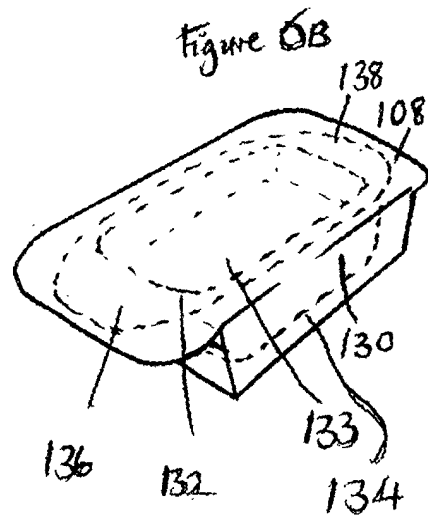
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(54) **Package and machinery for forming same**

(57) The invention relates to retail packaging for a foodstuff, typically held in a tray (4) or other article and the packaging further includes a sleeve (106) in which the article containing the foodstuff is placed. The sleeve (106) includes location means for the article in the sleeve and the locating means are formed from material of the front and/or rear and/or side walls of the sleeve

folded inwardly such that additional material is not required to be provided on the sleeve. The invention also relates to apparatus for placing the article into the sleeve of the invention to form the package. A package with a sleeve of reduced material usage is obtained and the article and sleeve can be formed into the package using substantially conventional apparatus.





## Description

**[0001]** The invention to which this application relates is to a package of the type forming a retail package and machinery for forming these components of the packaging into the retail package.

**[0002]** The increase in packaging of materials and in particular foodstuffs, means that there are various methods and systems for forming packages and numerous designs and configurations of said packages. In general however, the packages can be split into two basic forms. A first form is to provide the foodstuff in a tray or other form of container and to place the tray within a box, said box having four parallel crease lines which serve to define a front face, rear face and joining side walls and closure flaps at each end such that when the closure flaps are brought together, a box is formed within which the tray is fully enclosed. This form of package is acceptable when the tray retained within the box is of a relatively similar shape to the side walls of the box in particular. However, the majority of trays in which foodstuffs are now contained typically have sloping side walls and a top lip such that while the top lip may contact the side walls, there is no other contact with the side walls of the box by the tray and so the box can become relatively flexible and hence make it difficult to stack the same and display the boxes in a convenient and visually pleasing way by retailers.

**[0003]** An alternative form of packaging comprises a tray which is housed within a sleeve rather than a box. The sleeve typically has a number of crease lines more than those for a box construction and typically has 5 or more parallel crease lines to allow the sleeve to be formed. The sleeve, when formed, has front and rear faces with multi-faceted side walls and open ends. The number of increased parallel crease lines is required to allow the multi-faceted side walls to be formed and hence the sleeve to be formed such that the side walls take a similar shape, when the sleeve is formed, to the sloping side walls and lip of the tray, hence allowing the sleeve to take a closer form to the shape of the tray. However, the sleeve itself is a more difficult form of packaging to form and in many instances can be required to be wrapped around the tray and sealed in position and therefore specialised and specific machinery has to be produced to erect the sleeve, and/or form the sleeve and then allow the sleeve to be positioned with respect to a tray to form the package. It is not possible to use the conventional box forming machinery and hence the expense to a package operator from converting from boxes to sleeves is large and in many cases prohibitive.

**[0004]** The aim of the present invention is to provide a package, package blank and machinery for forming the same in a form which is economical for use and furthermore, efficient and also does not require any additional board material to that which is required for conventional sleeve formations.

**[0005]** In a first aspect of the invention, there is pro-

vided a package, said package comprising an article in which material such as a foodstuff is located, said article secured within outer packaging formed from a blank, said outer packaging comprising when formed, parallel front and rear faces; side walls and at least one end opening through which the tray can be placed into the packaging and/or removed from the same and wherein the tray is retained within the packaging by means of locating means formed from part of the side and/or front and/or rear faces being folded inwardly at said at least one open end to partially close said open end.

**[0006]** By providing the location means to be folded inwardly at the open end so the same can be positioned to move inwardly to contact with the base of an inwardly sloping portion of the article side. This therefore means that no additional board material is required to be provided in accordance with the invention in comparison to the board material which would be required to be used in the formation of a conventional sleeve for the article.

Thus advantages can be obtained as will herein be described without any additional expenditure in terms of materials usage.

**[0007]** Preferably said side walls of the package are held in a substantially parallel relationship by the movement of the location means inwardly.

**[0008]** By providing the side walls of the package in parallel, so a blank with only four parallel crease lines can be used so forming the rear, front, and two side wall faces of the packaging. This therefore prevents the need for further and new machinery to be used and allows conventional box cartoning machinery to be used with relatively minor adjustment and without the need for additional material usage.

**[0009]** In one embodiment, the location means at said open end are creased so that the same need only be folded inwardly of the opening to firstly engage the tray in position and, furthermore, provide a means for locking the side walls of the packaging in parallel relationship, thereby adding rigidity to the package.

**[0010]** In an alternative embodiment, the location means comprises a main flap passing substantially along the length of the opening and two further flaps which can be attached to the main flap to secure the same in the engaging position.

**[0011]** It is preferred that the packaging comprises two end openings and at each of the end openings there is provided location means as herein described although this may vary for different product types which are to be secured in the packaging.

**[0012]** Although it is typically the case that the article held within the package will be a tray for foodstuffs, it is also possible that other articles can be secured within the packaging and form a package in accordance with the invention.

**[0013]** In accordance with a further aspect of the invention there is provided a packaging blank, said blank having four parallel crease lines to define front, rear, and two side walls and location means depending from said

front or rear faces and side walls such that said blank is erected by gluing together side walls and/or a side wall flap to any of the front or end faces, such that the side walls are parallel and, when an article is placed within the blank in the erected form, the location means are moved inwardly of the open ends to an engaging position to secure the article within the blank.

**[0014]** In a further aspect of the invention there is provided a sleeve arrangement for a tray containing a foodstuff, said tray having side walls which depend inwardly from a top face to a base and, on the top surface, two opposed lugs depend outwardly to opposing sides of the tray, said lugs provided, for gripping and handling of the tray and characterised in that the sleeve includes a top face, which, when the sleeve is erected and the tray inserted therein, extends to or beyond the lugs of the tray, a base and two side walls connecting the base to the top surface and characterised in that depending from the base or top surface are provided location flaps at opposing ends thereof and at each of said ends, from said side walls, securing flaps are provided to be moved and attached to the flap and the free edges of said location flaps are shaped so as to contact the adjacent side wall of the tray and exert a retaining force thereon.

**[0015]** In one embodiment, the side walls of the tray can be curved and, in this instance, the free edges of the location flaps are formed so as to contact the side walls around a curved section of the same thereby adding to the retention of the tray within the sleeve.

**[0016]** In a further aspect of the invention there is provided apparatus for forming a package in accordance with the invention, said apparatus comprising a means for moving a preformed blank in a flattened condition to an erected condition using an end load cartoning machine, placing the article into the erected blank through an end opening of the blank and moving location means inwardly of the open end to an engaging position to secure the article in the package.

**[0017]** Typically the blanks are provided to the point of assembly of the package in pre-glued format but in a flattened condition for storage purposes so that only erection of the blank is required.

**[0018]** Typically, both ends of the blank, when erected, are open and location means are provided at each opening to be moved to the engaging position once the article is placed within the blank.

**[0019]** In a further aspect of the invention, there is provided apparatus for the erection and packing of a foodstuff tray in a sleeve in accordance with the invention, said apparatus comprising a feeding means which moves the foodstuff tray towards a sleeve, said sleeve having previously been erected from a flattened, storage condition, to an upstanding condition defining a port into which the tray is to be introduced, said tray introduced into the port to lie within a cavity defined by the walls of the sleeve and, once in said cavity, locating flaps depending from the base of the sleeve at the opposing open ends of the sleeve are moved to an upstanding

condition to partially trap the tray within the cavity and securing flaps depending from the side walls are folded inwardly and attached to the locating flap depending from the base at each end of the sleeve to thereby secure the tray in the sleeve and form a retail package.

**[0020]** In one embodiment, the tray is introduced into a port which is defined by the top, base and side walls of the sleeve and there is a tendency for the top surface of the sleeve to bow inwardly. This bowing can cause the tray to become snagged on the same and thereby prevent the tray from entering the cavity. This can cause failure of the packaging operation, and subsequent operations thereafter, leading to downtime and wastage.

**[0021]** It is a further feature of the invention that the edge of the top surface of the sleeve extends beyond the edge of the base and the tray is introduced towards the sleeve for insertion in the part on a plane lower than the plane of the base of the sleeve until a location under the edge of the top surface of the sleeve or a location between the said edge of the top surface and edge of the base, whereupon the tray, in addition to moving towards the sleeve, is also moved upwardly so as to exert a lifting action on the top surface as the tray is introduced into the port, and hence cavity, of the sleeve.

**[0022]** Specific embodiments of the invention will now be described with reference to the accompanying drawings wherein:-

Figures 1 and 2 illustrate, respectively, a package in accordance with one embodiment of the invention and a blank for the package in that embodiment;

Figures 3 and 4 illustrate respectively a package formed in accordance with another embodiment of the invention and a blank for said package;

Figure 5 illustrates three different forms of the sleeve in accordance with the invention;

Figures 6A and B illustrate a sleeve according to one embodiment of the invention; and

Figures 7A and B illustrate one embodiment of packaging machinery according to the invention.

**[0023]** Referring firstly to Figures 1 and 2, there is illustrated a package 2 comprising, in this case, a tray 4 shown mostly in dotted lines for illustrative purposes within an erected carton blank 6. The tray is provided to carry foodstuffs and typically foodstuffs which are either pre-cooked or are "ready to cook" meals. The blank comprises a front face 8, rear face 10 and two side walls 12, 14 which when erected are held in parallel as shown in Figure 1. The package is formed by erecting the blank to the form shown in figure 1, moving the tray into the blank to the position shown in Figure 1 and then folding inwardly, location means 16, 18 provided at each of the

end openings 20, 22 of the package. In this embodiment, the location means are folded inwardly such that they act to retain the tray within the blank thereby forming the package and allowing the same to subsequently be put on display for retail purposes and also, provide added rigidity to the package by maintaining the side walls in a substantially parallel relationship regardless of the shape of the tray itself. This therefore overcomes the need for the blank to have side walls of a similar shape to the side walls of the tray as is the case with conventional sleeve arrangements and hence avoids the need for more than four crease lines to be provided which, in turn, allows substantially conventional forming machinery to be used with minor adjustment rather than completely new machinery to be used and without the need for additional board material to be utilised

**[0024]** The embodiment shown in Figures 3 and 4 is similar to that of Figures 1 and 2 and, where appropriate, the same reference numerals are used. The main difference however is that in this case the location means at each of the openings differ inasmuch that there is provided a main flap 24 which is folded inwardly and then two side flaps 26, 28 are folded inwardly and in this case glued to the main flap to form the location means. This arrangement has the added advantage that they provide a degree of tamper evidence to the package inasmuch that the location means are formed so that the tray cannot be removed from the package without the glue tabs 26, 28 being opened. It is envisaged that this feature will be of importance to some retailers of packages of this type.

**[0025]** Referring now to Figure 5 there are illustrated three sleeves 102, 104, 106, each embodiment formed in accordance with the present invention. Normally, in the form shown, the foodstuff tray is located within the sleeve but, for the ease of description, the tray is not shown in the drawing. Each sleeve comprises a top surface 108, a base 110, side walls 112 and 114 and two open ends 116, 118. At each open end, in this case shown at the open end 116 of each of the sleeves, there is provided a first flap 120 depending from the base and two side flaps 122, 124 depending from the side walls which allow the partial closure of each of the openings.

**[0026]** As can be seen, the sleeves can be provided in a number of different embodiments and the sleeve embodiment 106 is now described in greater detail.

**[0027]** Figures 6A and 6B illustrate the sleeve 106 with Figure 6A illustrating the sleeve blank and Figure 6B illustrating a retail package formed in accordance with this embodiment.

**[0028]** Figure 6A illustrates a sleeve used to form a blank with a location flap 116 at each open end 129 of the sleeve. The blank is also provided with a glue flap 131 provided to be glued to the side wall in the area 128 indicated by broken lines and thus, when formed, the sleeve can be provided in a flattened package form but then erected for the insertion of the tray at the time of packaging.

**[0029]** A typical form of tray 133 which is to be inserted in this particular embodiment of sleeve is shown in broken lines in Figure 6B and comprises inwardly sloping side walls 130 which slope inwardly from a top surface 132 to the base 134. At the top surface are provided lugs 136, 138 which are provided for gripping the tray when in use and the top surface 108 of the sleeve is formed so as to extend beyond the lugs as shown. Furthermore, the tray, in this form has curved side walls and the free edges of the location flaps 116 at each of the ports 129, are formed with shaped edges 135, as shown in Figure 6A, to match the shape of the tray side walls to contact same and exert a retaining action on the side walls to maintain the tray within the sleeve to hence form the retail pack of the invention.

**[0030]** It will be seen that in all of the embodiments of the sleeve, the edges of the top surface extend beyond the respective edges of the base and this is a significant part of the invention. However, when inserting the tray through a port and into the cavity defined by said top surface 108 base 110 and side walls 112, 114 when the sleeve is erected, as shown in Figure 7A there can be a problem in that the top surface 108 bows inwardly and if the top surface of the tray snags with this so the same cannot be introduced into the sleeve.

**[0031]** Figure 7B illustrates a solution to this problem wherein the tray 133 is introduced towards the erected sleeve 106 as indicated by arrow 144. However, it will be seen that the plane defined by the transfer plate 146 which supports the tray as it is moved along towards the sleeve, is on a lower plane than the lower surface 148 of the sleeve. This lower plane is maintained until the front end 150 of the tray reaches the position as indicated by broken lines 152 in which the same has entered the sleeve beyond the edge of the top surface but has not yet reached the edge 160 of the base 110. At this point, the transfer plate is shaped at section 161 to move the tray 133 upwardly thereby causing the front edge of the tray 150 to exert a lifting action as it moves to the position 156 shown by broken lines and hence supports the top surface and removes any bowing of the top surface 108 of the sleeve. With the bowing removed, the sleeve can then be introduced effectively and efficiently into the cavity of the sleeve and the gluing operation performed on the locating and securing flaps 116, 122, 124 to form the partial closing of the open ends of the sleeve as indicated in Figure 5.

**[0032]** The invention provides several key advantages, namely, minimal board usage for the formation of the blanks and no additional board material usage in comparison with conventional sleeves. In one embodiment the package can be tamper evident without any additional board being used and there is no raw edge of carton board across any of the front, rear or side faces. The tolerances of the tray and carton do not need to be so tight as with the sleeve and tray arrangements and the machinery is adhesive free on the tucking version. Furthermore the package has its own integrity and will hold

square with odd shaped products.

[0033] There are also provided better artwork possibilities on the packaging due to the increase in non-increased surfaces available. As there is no significant contact with the side walls of the tray or article in the package then there is a reduced risk of grease or other liquid passing through to the board material.. Furthermore it is possible to end shelf stack the package and the application and manufacture of the package is improved with the automation of the package forming process improved with existing carton box forming machinery used with only minor adjustment.

## Claims

1. A package, said package comprising an article in which material such as a foodstuff is located, said article secured within outer packaging formed from a blank, said outer packaging comprising when formed, parallel front and rear faces; side walls and at least one end opening through which the tray can be placed into the packaging and/or removed from the same and wherein the tray is retained within the packaging by means of locating means formed from part of the side and/ or front and/or rear faces being folded inwardly at said at least one open end to partially close said open end.
2. A package according to claim 1 **characterised in that** the locating means when folded inwardly contact with an inwardly sloping portion of the article side.
3. A package according to claim 1 **characterised in that** the side walls of the package are held in a substantially parallel relationship by the movement of the location means inwardly.
4. A package according to claim 3 **characterised in that** the side walls of the package in parallel, so a blank with only four parallel crease lines can be used so forming the rear, front, and two side wall faces of the packaging.
5. A package according to claim 1 **characterised in that** the location means at said open end are creased so that the same need only be folded inwardly of the opening to firstly engage the tray in position and, furthermore, provide a means for locking the side walls of the packaging in parallel relationship.
6. A package according to claim 1 **characterised in that** the location means comprise a flap passing substantially along the length of the opening and two further flaps attachable to the main flap to secure the same in the engaging position.
7. A package according to claim 1 **characterised in that** the packaging comprises two end openings and at each of the end openings there are provided location means.
8. A packaging sleeve blank, said blank having four parallel crease lines to define front, rear, and two side walls and location means depending from said front or rear faces and side walls such that said blank is erected by gluing together side walls and/ or a side wall flap to any of the front or end faces, such that the side walls are parallel and, when an article is placed within the blank in the erected form, the location means are moved inwardly of the open ends to an engaging position to secure the article within the blank.
9. A sleeve arrangement for a tray containing a foodstuff, said tray having side walls which depend inwardly from a top face to a base and, on the top surface, two opposed lugs depend outwardly to opposing sides of the tray, said lugs provided, for gripping and handling of the tray and **characterised in that** the sleeve includes a top face, which, when the sleeve is erected and the tray inserted therein, extends to or beyond the lugs of the tray, a base and two side walls connecting the base to the top surface and **characterised in that** depending from the base or top surface are provided location flaps at opposing ends thereof and at each of said ends, from said side walls, securing flaps are provided to be moved and attached to the flap and the free edges of said location flaps are shaped so as to contact the adjacent side wall of the tray and exert a retaining force thereon.
10. A sleeve arrangement according to claim 9 **characterised in that** the side walls of the tray are curved and the free edges of the location flaps are formed so as to contact the side walls around a curved section of the same thereby aiding the retention of the tray within the sleeve.
11. Apparatus for forming a package in accordance with the invention, said apparatus comprising a means for moving a preformed blank in a flattened condition to an erected condition using an end load cartoning machine, placing the article into the erected blank through an end opening of the blank and moving location means inwardly of the open end to an engaging position to secure the article in the package.
12. Apparatus according to claim 11 **characterised in that** the blanks are provided to the point of assembly of the package in pre-glued format but in a flattened condition for storage purposes so that only erection of the blank is required at the apparatus.

13. Apparatus according to claim 11 **characterised in that** means are provided to move location means inwardly at two open ends of the blank.

14. Apparatus for the erection and packing of a foodstuff tray in a sleeve in accordance with the invention, said apparatus comprising a feeding means which moves the foodstuff tray towards the sleeve, said sleeve having previously been erected from a flattened, storage condition, to an upstanding condition defining a port into which the tray is to be introduced, said tray introduced into the port to lie within a cavity defined by the walls of the sleeve and, once in said cavity, locating flaps depending from the base of the sleeve at the opposing open ends of the sleeve are moved to an upstanding condition to partially trap the tray within the cavity and securing flaps depending from the side walls are folded inwardly and attached to the locating flap depending from the base at each end of the sleeve to thereby secure the tray in the sleeve and form a retail package.

15. Apparatus according to claim 14 **characterised in that** the tray is introduced into the port which is defined by the top, base and side walls of the sleeve and the edge of the top surface of the sleeve at the port extends beyond the edge of the base and the tray is introduced towards the sleeve for insertion in the port on a plane lower than the plane of the base of the sleeve until a location at or beyond the edge of the top surface of the sleeve whereupon the tray, in addition to moving towards the sleeve, is also moved upwardly so as to exert a lifting action on the top surface of the sleeve as the tray is introduced into the port, and hence cavity, of the sleeve.

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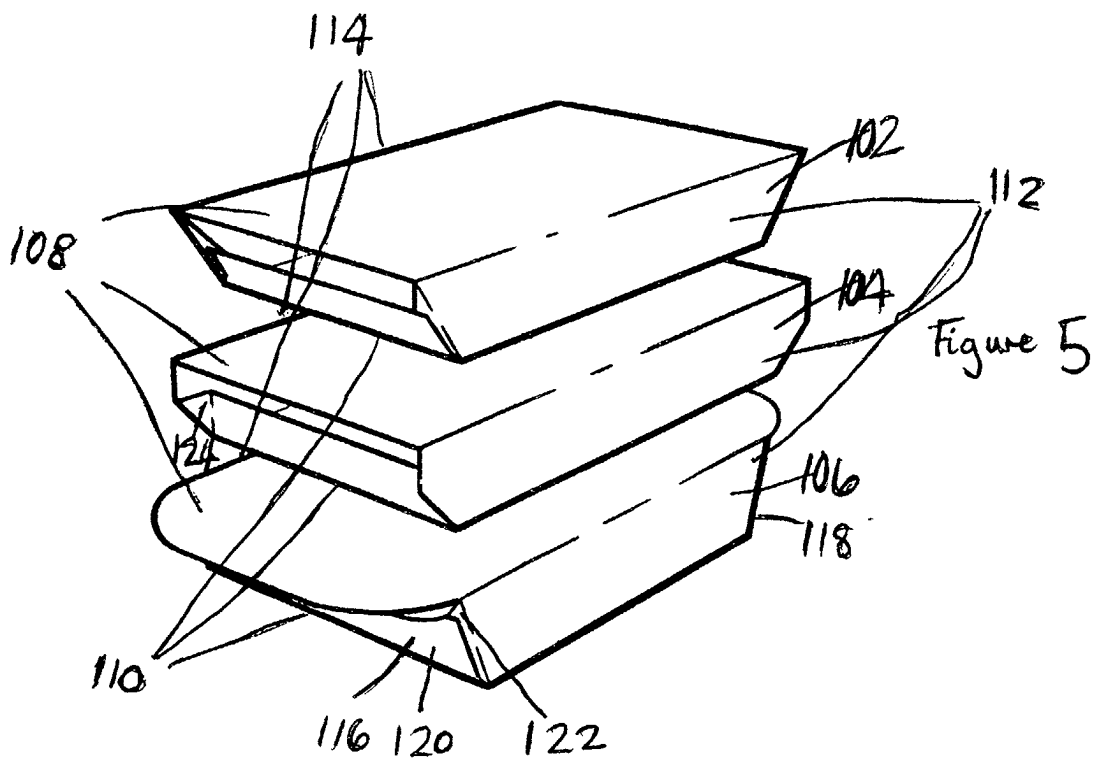
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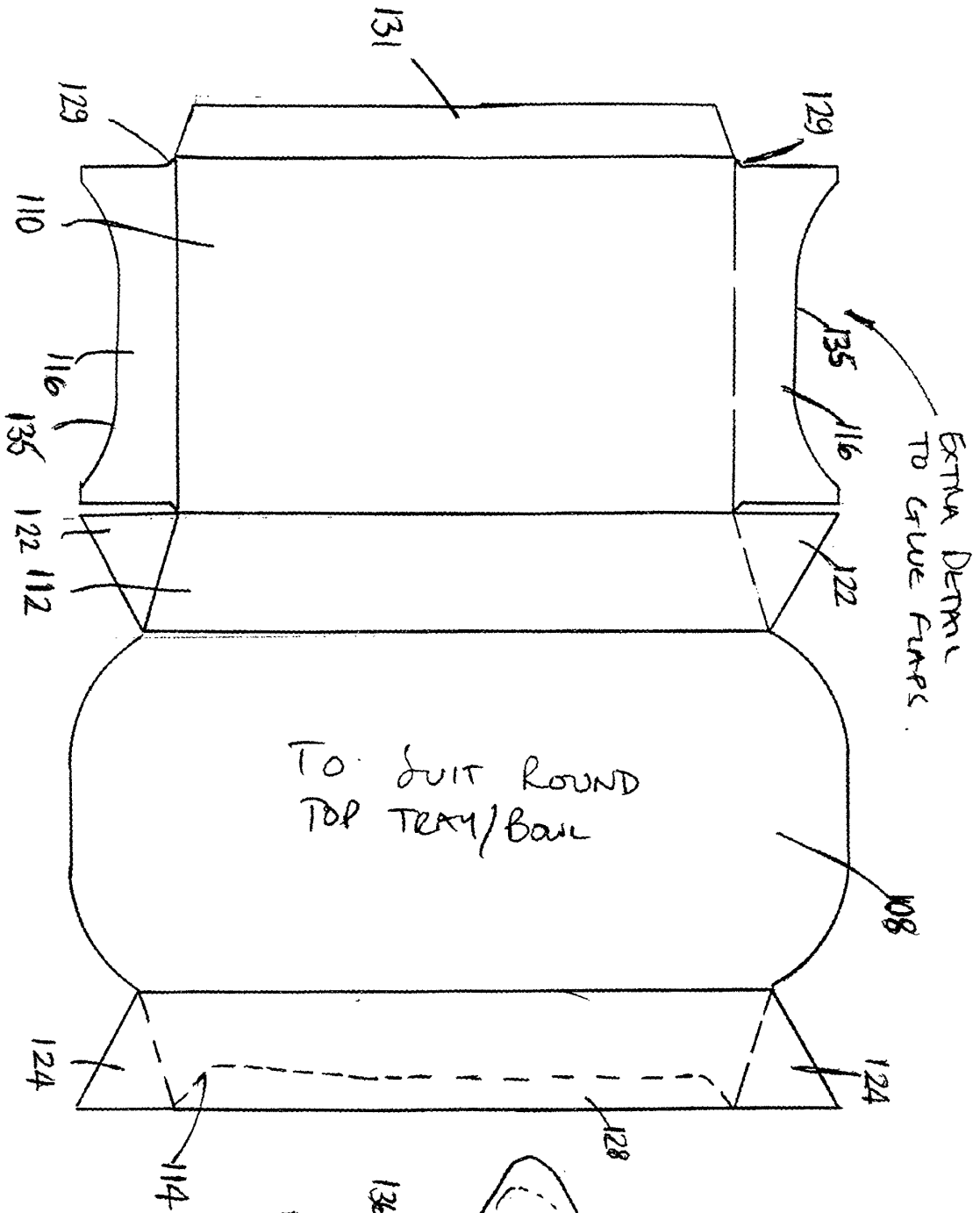


Figure 6A

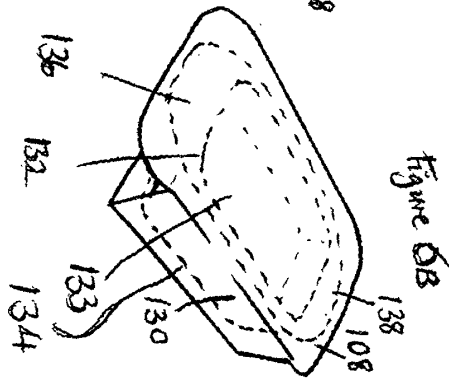


Figure 6B

