July 6, 1965 F. W. ROGERS 3,193,427

METHOD OF MAKING DISPENSING CARTON WITH CUTTING EDGE

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FIG. 1

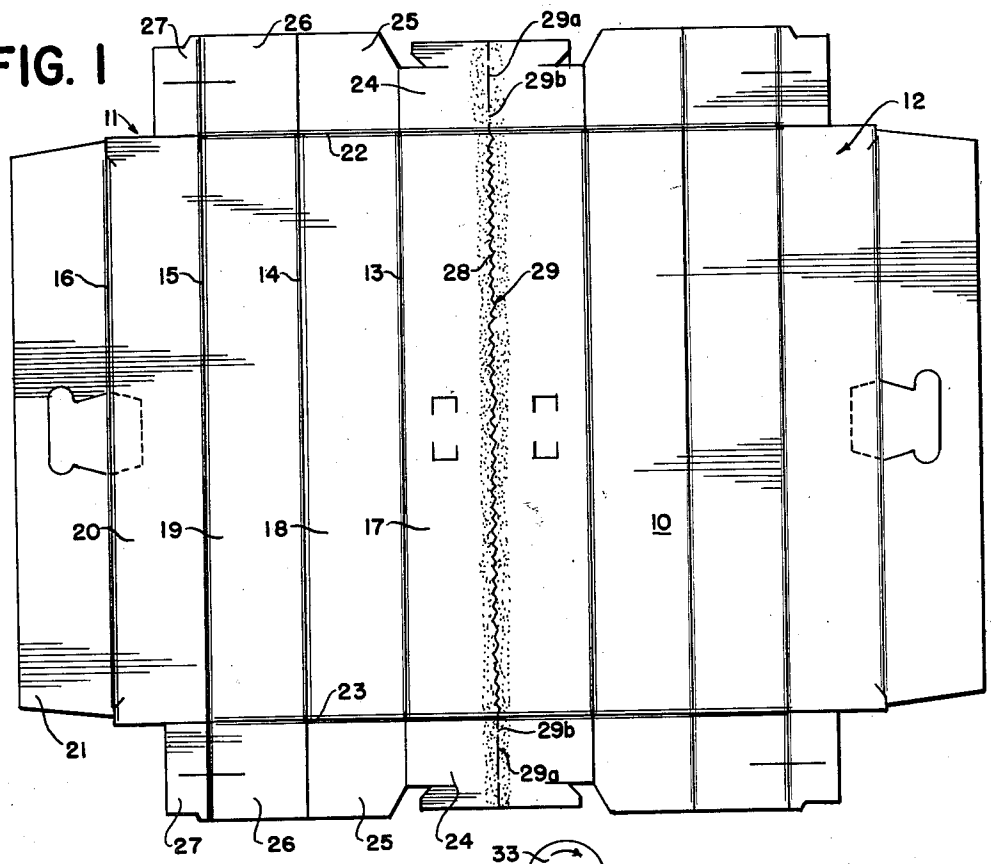



FIG. 2

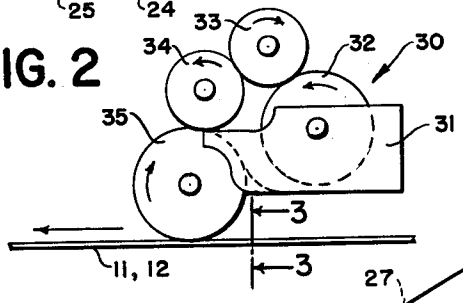



FIG. 3

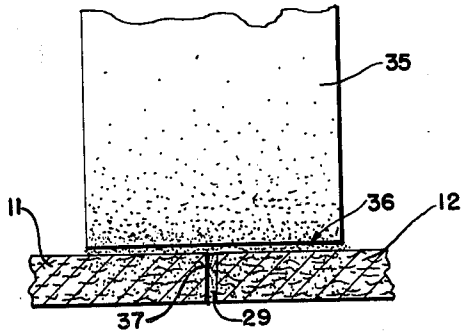
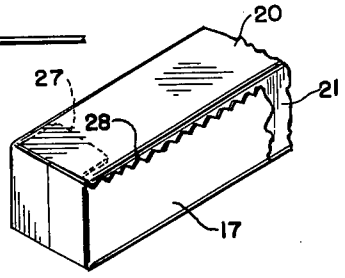



FIG. 4




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FIG. 5

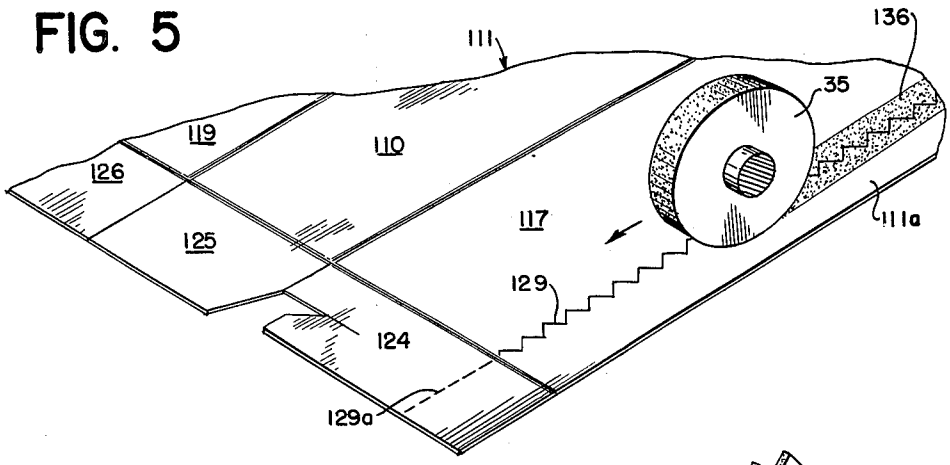
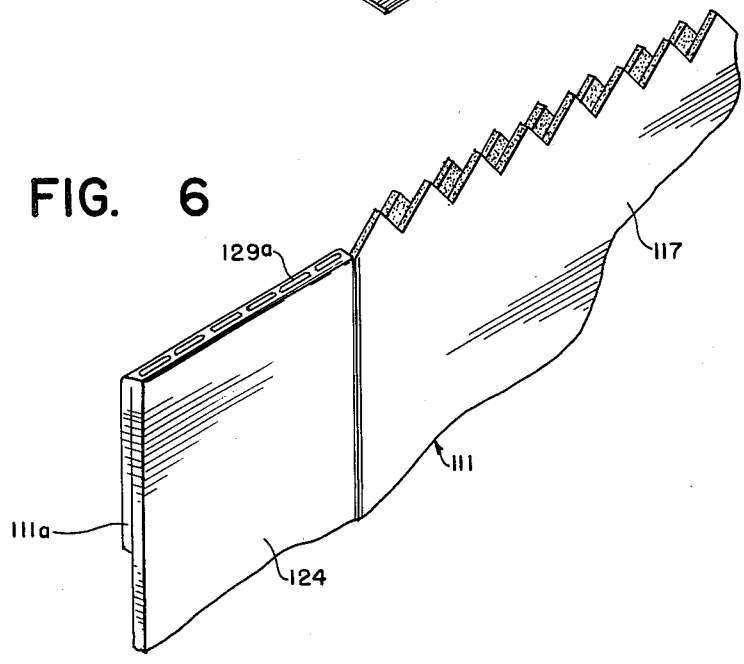



FIG. 6




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# METHOD OF MAKING DISPENSING CARTON WITH CUTTING EDGE

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The present invention relates generally to dispensing cartons of the type commonly used for dispensing waxed paper, aluminum foil, Saran and other wrapping materials, and is directed more specifically to a novel method of manufacture enabling such dispensing cartons to be economically produced with an integral cutting edge.

Conventional household wrapping materials, such as waxed paper, aluminum foil and the like commonly are packaged in roll form, in suitable dispensing cartons which contain the roll and permit the web of wrapping material to be drawn outward and cut off at a desired length. Typically, the dispensing cartons have attached thereto a serrated metal edge, enabling the wrapping material to be severed cleanly across its width after a desired length has been drawn from the carton.

In view of the significant added expense of providing a separate, metal cutting edge on a paperboard dispensing carton, it has been proposed many times in the past to provide the carton with an integral cutting edge, in the form of a serrated edge of the paperboard material itself. Conventionally used paperboard materials do not, however, possess sufficient strength and toughness to enable a suitable cutting edge to be formed integrally, and it has been accordingly proposed in the past to stiffen and reinforce the integral cutting edge by impregnating the paperboard carton material, in the region of the cutting edge, with a reinforcing composition.

While the basic concept of providing an impregnated and reinforced integral cutting edge on a paperboard dispensing carton has been theoretically appealing, it has not been possible in the past, insofar as the applicant is aware, to make a commercially suitable dispensing carton of this type. One reason for the failures of the past has been a continued inability to provide a specifically satisfactory impregnating composition which would meet the various critical requirements of the specific, intended end use.

A second significant factor which has prevented the realization of a commercial carton with an integral cutting edge is the past inability to apply the impregnating composition in a manner which was economically advantageous yet capable of achieving proper impregnation of the cutting edge area, while at the same time keeping exposed areas of the carton desirably free of the impregnating composition.

In accordance with the invention, a novel and improved method is provided for applying impregnating composition to a paperboard blank, for making an impregnated and reinforced serrated cutting edge, which enables production to be carried out on an economical, high speed basis, which assures a desirable, edgewise penetration of the paperboard by the impregnating composition in the region of the serrated cutting edge, and which, at the same time, keeps exposed, outer areas of the blank desirably free of the impregnating composition. Specifically, the method of the invention involves, in its most practicable form, the preparation of tandem carton blanks, which are provided with a central line cut of serratic form, defining opposed, serrated cutting edges. The serratic cut is referred to herein as a "line" cut to describe the fact that the tandem blank is simply divided along a cut, without the removal of a section of material. At one



or more places, the cut is discontinuous, so that the paperboard material bridges the cut in one or more limited places, such that the opposed, serrated edges, formed by the cut, are maintained in abutted relationship, until the sections eventually are separated by rupturing of the bridging areas.

While the opposed serrated cutting edges are maintained in abutting relationship, the reinforcing composition is applid to the "inside" surface of the blank, along a longitudinal area wholly inclusive of the lateral excursions of the serratic cut. The arrangement is such that marginal areas of the tandem blanks, immediately adjacent the serrated edges, are impregnated laterally by the composition and, in addition, the composition is drawn by capillary action into the crevice formed by the abutting edges created by the serratic line cut, such that there is substantial edgewise penetration of the board by the composition. The edgewise penetration is of particular significance in providing a hard, sharp cutting edge, which retains its form and its sharp edges over a substantial number of cutting operations comfortably inclusive of the maximum number of cutting operations expected in the dispensing of an entire roll of wrapping material from the carton. In addition, the capillary action which draws the impregnating composition into the line cut, for desired, edgewise penetration of the board, also serves to prevent or substantially minimize any flow of the composition through to the opposite or "outside" surface of the board. This is of substantial significance, in that the impregating composition does not detract from the exterior appearance of the carton, which normally is printed, colored or otherwise designed to present a pleasing outward appearance intended to stimulate sales appeal.

For a better understanding of the invention, reference should be made to the following detailed specification and to the accompanying drawings, in which:

FIG. 1 is a top plan view of a tandem blank arranged, according to the principles of the invention, to enable the formation of a pair of carton blanks, each provided with an integral, impregnated cutting edge of serratic form;

FIG. 2 is a simplified schematic representation of equipment for applying impregnated composition to the blank of FIG. 1;

FIG. 3 is a greatly enlarged, fragmentary cross-sectional view, taken generally along line 3—3 of FIG. 2, illustrating the manner of applying impregnating composition to the carton blanks of FIG. 1;

FIG. 4 is a fragmentary, perspective view illustrating a dispensing carton formed by a blank of the design shown in FIG. 1; and

FIGS. 5 and 6 are various views illustrating the manufacture and construction of a modification of the new dispensing carton.

Referring now to the drawings, and initially to FIG. 1 thereof, the reference numeral **10** designates generally a tandem blank, which is divided longitudinally to form individual blanks **11**, **12**, each intended to form a dispensing carton for waxed paper, aluminum foil or other conventional household wrapping materials. The blank **11**, which is identical to the blank **12** except for its opposed orientation, is formed of paperboard material of a typical grade used in the manufacture of paperboard cartons, and is provided with four longitudinal score lines **13–16** dividing the blank into a front wall **17**, a bottom wall **18**, a back wall **19**, a top wall **20**, and a front tuck flap **21**. Transverse score lines **22**, **23** are provided at each end, together with other cuts and scores, not specifically identified, to form a pair of rearwardly extending end flaps **24**, a pair of upwardly extending end flaps **25**, a pair of forwardly extending end flaps **26** and short retaining flaps **27**. The retaining flaps **27** are foldably at-

tached to the forwardly extending end flaps 26, along the score line 15, and are arranged to be folded inward, over the top of the open carton body, when the blank 11 is erected.

The general construction of the blank 11 is conventional, being designed to form, when erected, an elongated carton of square cross-section, as indicated in FIG. 4, arranged to receive an elongated roll of wrapping material. The retaining flaps 27 extend inwardly, under the cover flap and over the roll of wrapping material, so that the roll of material is retained within the carton body, even if the cover and its attached front flap 21 are open.

In accordance with generally conventional construction of a carton of this type, the front wall 17 is provided along its free edge with a serrated cutting edge 28 such that, when the web of wrapping material is drawn from the carton, it may be pressed downward over the cutting edge and severed from the remaining body of the wrapping material. The present invention, however, is directed to the specific form of the cutting edge 28 and particularly to the method of manufacturing the carton which enables a commercially practicable, integral cutting edge to be realized. In this respect, the carton of the invention departs significantly from conventional carton construction, which heretofore has required the use of a separate metal attachment to provide a usable, serrated cutting edge. The present invention, in contrast, utilizes the paperboard material of the carton front wall itself to provide a desired, serrated cutting edge, the heart of the invention of the present application residing in the discovery of a specific, commercially feasible procedure by which this desirable objective could be realized.

One of the substantial contributions enabling the manufacture of a dispensing carton having an integral, serrated cutting edge was the development of a specifically suitable reinforcing composition, which is referred to herein as a resorcinol-containing phenolic resin. The present invention is directed to a specific and highly advantageous procedure for applying the impregnating composition, particularly but not necessarily the above-mentioned resorcinol-containing phenolic composition.

One of the problems in connection with the proper impregnation of a serrated cutting edge, to achieve desired characteristics of hardness, durability, moisture resistance, cohesive strength and the like, resides in the creation and maintenance of proper conditions for the reinforcing composition to penetrate the paperboard material in the region of the serrated cutting edge. Specifically, proper penetration includes substantial penetration into the raw, cut edges of the paperboard material. At the same time, the commercial requirements of the carton dictate that the reinforcing composition be kept away from the outer surface of the carton board, which is often attractively designed and printed and would be affected undesirably by a coating of the reinforcing composition.

In accordance with the invention, the carton blanks are are formed in opposed pairs, as illustrated at 11, 12 in FIG. 1, and a serratic cut 29 is made in the tandem blank, to divide the front wall panels of the respective sections. The cut 29 is extended, in straight line form through the flaps 24, as indicated at 29*a*, substantially dividing the tandem blank into two individual sections, except that, advantageously, the cuts 29*a* are discontinuous at one or more limited places to provide bridging sections 29*b* which serve to maintain the divided sections substantially in their initial, opposed relationship. The cut 29, although of serratic form, is descriptively referred to herein as a line cut, in the sense that no substantial amount of paperboard material is removed by the cutting operation. Typically, the cut is formed by a knife edge of serratic contour, which simply divides the sections of paperboard material without actually removing a section or strip of the paperboard.

In accordance with the invention, the opposed blanks 11, 12, following the making of the serratic cut 29, and while the raw edges of each blank, formed by the cut 29, are maintained in opposed, abutted relationship by the bridging sections 29*b*, are conveyed longitudinally past an applicating station 30 (FIG. 2), at which the impregnating composition, advantageously the above-mentioned resorcinol containing phenolic resin is applied. Typically, the applicator station comprises a reservoir 31 for containing a supply of the impregnating composition in a substantially liquid form, a roller 32 journaled for rotation and partly immersed in the contained body of reinforcing composition, one or more transfer rollers 33, 34 and an applicator roller 35. The arrangement is such that, as the blanks 11, 12 are conveyed in pairs through the applicator station, the applicator roller 35 contacts the upper surface of the tandem blanks, the blanks being arranged so that the upper surface, at that point in the manufacturing procedure, is the "inside" surface of the carton. The effective width of the applicator 35, and its disposition relative to the serratic cut 29 is such that, as a continuous process, the applicator roller will apply a continuous strip of the reinforcing composition to a predetermined longitudinal area of the abutted blanks, which predetermined, longitudinal area is wholly inclusive of the lateral excursions of the serratic cut 29. The arrangement is such that marginal areas of the respective blanks 11, 12, in the immediate regions of the serratic cut 29 are coated with the impregnating composition, which is caused and enabled to penetrate the board through its principal upper surface. In addition, and as a significant aspect of the invention, the serratic line cut 29 forms a vertical capillary crevice in the tandem blank, which causes the reinforcing composition to be drawn downward into the cut, whereupon the composition penetrates the paperboard in an edgewise direction, along the raw, cut edges.

Thus, in accordance with the invention, penetration of the cutting edge areas of the paperboard blanks commences and occurs not only from the inner surface of the paperboard, but also from the raw, cut edges, the latter being of particular importance, in view of the fact that the active cutting surfaces of the serrated cutting edges 28 are provided by the raw, cut edges.

One of the additional, significant advantages of the desecribed procedure resides in the fact that, while desirable, edgewise penetration of the reinforcing composition is realized, the capillary passage formed by the abutted raw edges created by the serratic line cut 29 performs an additional function of preventing or greatly minimizing flow of the reinforcing composition through to the printed or "outside" surface of the carton blanks. Thus, as indicated in FIG. 3, the reinforcing composition is applied in a defined strip, designated by the numeral 36, to the upper or "inside" surface of the tandem blanks, and additional quantities of the composition are drawn into the capillary passage, designated by the numeral 37, formed by the abutted raw edges created by the line cut 29. However, the capillary action in the passage 37 tends to contain the reinforcing composition within the passage 37, so that little, if any, of the composition spreads onto the lower or "outside" surface of the carton.

Thus, the procedure of the invention not only results in a particularly desirable impregnating result, from the standpoint of edgewise, and "inside" penetration, but it also achieves a highly desirable limitation of the flow of the impregnating composition, so that, to the greatest practical extent, the composition is kept away from the printed front surface of the carton. In addition, the procedure of the invention enables a given production to be achieved at a feeding speed of one-half that required for the impregnation of single blanks such that, with a given apparatus, longer times are available for drying and curing the impregnating resin. The last-mentioned feature is of significance in reducing the size of the apparatus, as well as the capital investment required for its installation.

In an advantageous alternative form of the invention, illustrated in FIGS. 5 and 6, the blanks are processed singly, rather than in tandem, and in a manner calculated to realize certain other advantages. Thus, in the alternative procedure, a blank **110** is provided which comprises a carton blank section **111**, similar to the section **11** of FIG. 1, and an integral reinforcing strip **111***a*, in place of the section **12** of FIG. 1. The reinforcing strip **111***a* may be relatively narrow (e.g., three-fourths of an inch) but of sufficient width to accommodate the applicator wheel **35**, for applying a strip **136** of reinforcinng composition which is wholly inclusive of the lateral excursions of a serratic line cut **129**, corresponding to the cut **29** of FIG. 1; desirably, the applied strip **136** of reinforcing composition does not extend completely to the edge of the strip **111***a*, as indicated particularly in FIG. 5.

In the modified arrangement of FIGS. 5 and 6, all the advantages of the arrangement of FIGS. 1–4 are realized, as concerns the application and penetration of the reinforcing composition, since the applicator wheel acts upon the abutted serrated edges of the board, precisely as in the arrangement of FIG. 1. Unlike the first described arrangement, however, the board sections on opposite sides of the serratic cut are not separated after application and curing of the reinforcing composition. Rather, the narrow reinforcing strip **111***a* is folded over upon the corresponding marginal edge area of the carton blank **111** along folding scores **129***a* provided at each end of the blank and specifically in the region of the end flap **124**.

In accordance with one aspect of the invention, the reinforcing strip **111***a* is adhesively secured in face-to-face relation with the inside surface of the front wall **117** of the carton blank, to provide additional substantial reinforcement in the region of the serrated cutting edge. In this respect, while the addition of the reinforcing strip **111***a* involves increasing the area of the blank by around 10 percent, the presence of the reinforcing strip in the finished carton structure permits a reduction of about 35 percent in the required thickness of the board, such that an overall savings of about 25 percent in paperboard requirements is realized.

Advantageously, the folding scores **129***a* are symmetrically located with respect to the lateral excursions of the serratic cut **129** such that, when the reinforcing strip **111***a* is folded over upon the front wall panel **117**, two rows of cutting teeth are provided, each of which is of equal effective height, as indicated in FIG. 6. Thus, a finished coating edge, having a predetermined total number of teeth of predetermined size may be provided by forming with the serratic line cut **129** one-half the desired number of teeth on each of the opposed board sections, with each tooth being approximately twice the "desired" size. As will be understood, this facilitates the formation of the serratic cut **129**. If desired, however, the folding scores **129** may be located in offset relation to the axis of symmetry of the serratic cut **129** such that, in accordance with known principles, one of the sets of serrated cutting edges will be offset from the other when the reinforcing strip **111***a* is folded over upon the panel **117**.

In the modified arrangement illustrated in FIGS. 5 and 6, the substantial advantages of edgewise and "inside" penetration of the reinforcing composition are realized, since the composition is applied in a strip overlapping the front panel **117** and the reinforcing strip **111***a* and wholly inclusive of the lateral excursions of the serartic cut **129**. Thus, the reinforcing composition is drawn into the capillary passage formed by the line cut **129**, simultaneously providing highly desirable edgewise penetration and substantially preventing flow of the reinforcing composition through to the "outside" surface of the carton.

It should be understood that the specific form of the



invention herein illustrated and described is intended to be representative only, as certain variations may be made in the specified procedure without departing from the clear teachings of the disclosure.

I claim:

**1.** The method of making the blank of a paperboard dispensing box, for wrapping materials and the like, wherein the box is provided with an integral, serrated cutting edge, which comprises,

(a) forming a multiple blank section comprising one or more opposed pairs of box blanks joined along a predetermined longitudinal axis,

(b) making a serratic line cut through the multiple blank along said predetermined axis simultaneously to form abutted serrated cutting edges having predetermined absorptive characteristics along each blank of an opposed pair, and

(c) thereafter maintaining said edges in abutted relation to form a vertical capillary passage and applying a reinforcing impregnating composition to one surface only of said multiple blank over said passage and wholly inclusive of the lateral excursions of said serratic cut,

(d) whereby said serrated cutting edges in abutted relation effectively limit the flow of said reinforcing impregnating composition, said composition thereby being received substantially only by said one surface and by said abutted absorptive edges.

**2.** The method of claim **1**, in which

(a) said blanks include opposed pairs of connected flap portions disposed along said predetermined axis and extending beyond the opposite ends of said serratic cut, and

(b) the step of making said serratic cut includes the making of dividing cuts along said predetermined axis and through said connected flap portions,

(c) said serrated edges being maintained in abutted relation during said applying step by partially maintaining the integrity of the connection between opposed pairs of said connected flap portions,

(d) the blanks of an opposed pair being readily separable by rupturing the remaining integrity of said connection.

**3.** The method of claim **2**, in which

(a) the characteristics of said impregnating composition are such, in relation to said serratic cut, that said composition is drawn by capillary action between said abutted serrated cutting edges and is caused to make an edgewise impregnating penetration of the paperboard margins forming the respective serrated cutting edges.

**4.** The method of making a paperboard panel having an impregnated and reinforced edge which comprises,

(a) providing a paperboard section of a size and shape larger than said panel,

(b) forming a line cut in said section to define a predetermined edge to be reinforced and to provide an opposed edge,

(c) maintaining said predetermined edge and said opposed edge in abutting relation to provide a capillary passage having a predetermined degree of absorbability, and

(d) applying a reinforcing impregnating composition to one surface only of said paperboard along a predetermined area inclusive of said line cut while said edges are maintained in abutting relation, whereby said passage limits the flow of said composition thereby limiting its application substantially to said one surface and said edges.

**5.** The method of claim **4**, in which

(a) said line cut is of serratic configuration, and

(b) said impregnating composition is applied along an area wholly inclusive of the excursions of said serratic line cut.

**6.** The method of claim **5**, in which

(a) said paperboard is of a size and shape to form a pair of opposed panels, and

(b) said serratic line cut is disposed and positioned to divide said paperboard section substantially symmetrically.

7. The method of claim 4, in which

(a) the step of maintaining said predetermined and opposed edges in abutting relation is performed by forming said line cut in a manner to leave predetermined, limited intact areas bridging said cut and connecting opposed portions of said paperboard section,

(b) said intact areas being readily rupturable to accommodate subsequent separation of said opposed portions.

8. The method of claim 4, in which



(a) the portion of said paperboard section including said opposed edge is maintained in attached relation to the remainder of said section, and

(b) said portion is folded over upon and secured to the remainder of said section.

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