Sept. 10, 1968 D. WAINBERG 3,400,876

CARTONS

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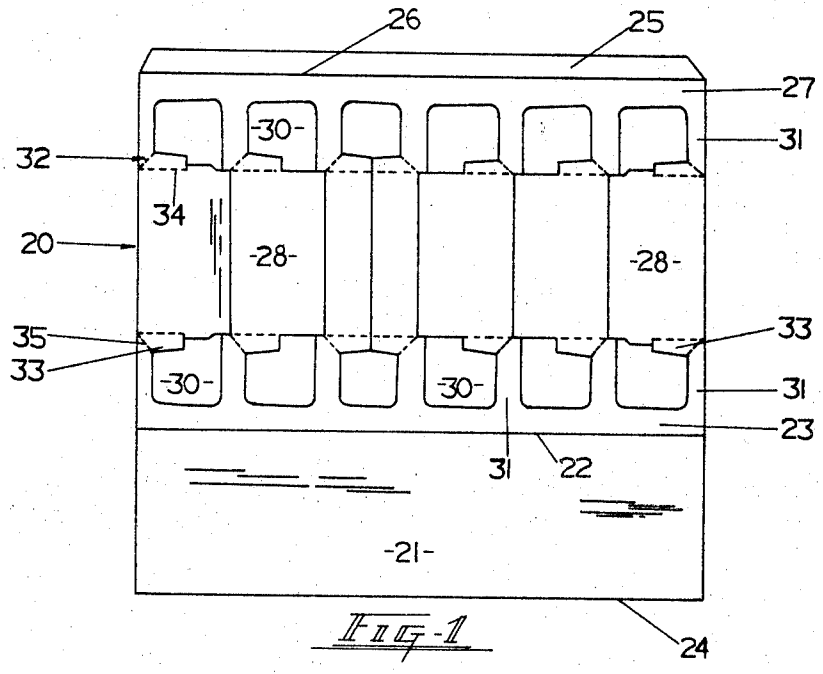


Fig-1

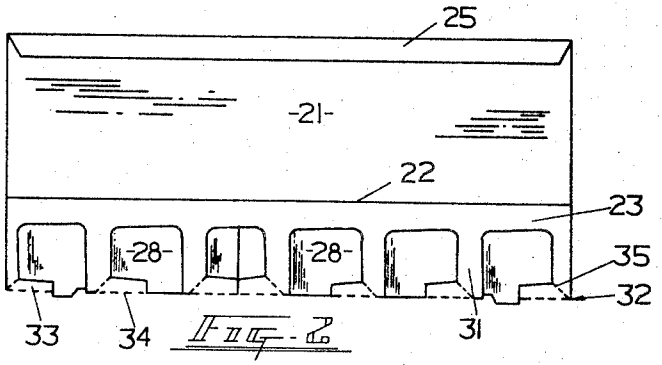


Fig-2

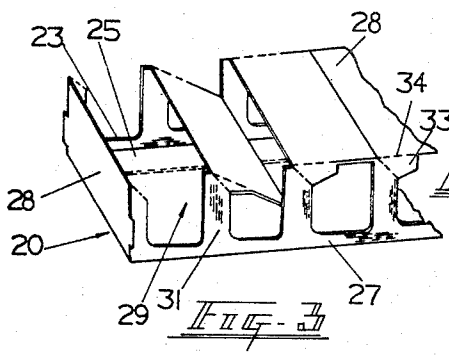


Fig-3

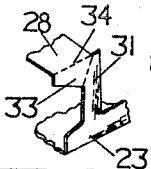


Fig-4



Fig-5

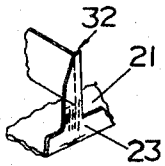


Fig-6

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Sept. 10, 1968 D. WAINBERG 3,400,876

CARTONS

Filed Aug. 10, 1967 5 Sheets-Sheet 2

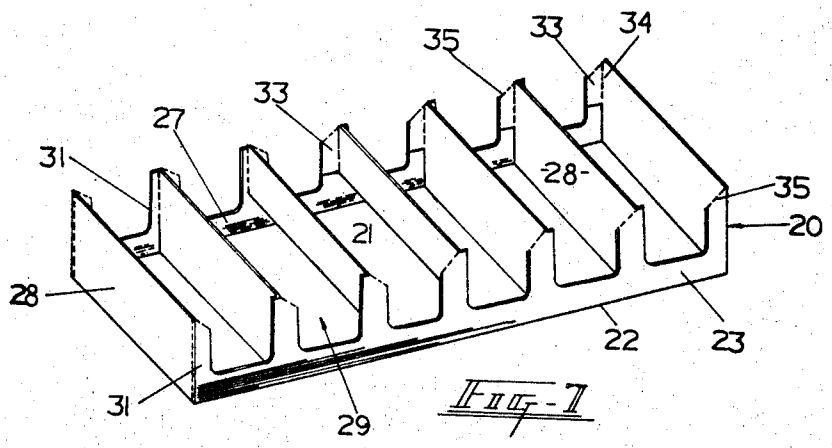


Fig-7

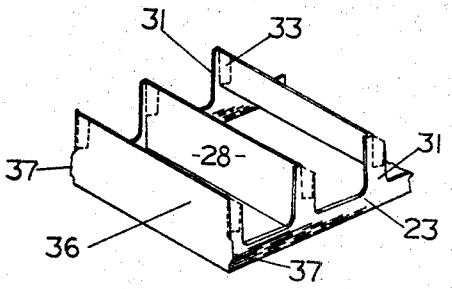


Fig-8

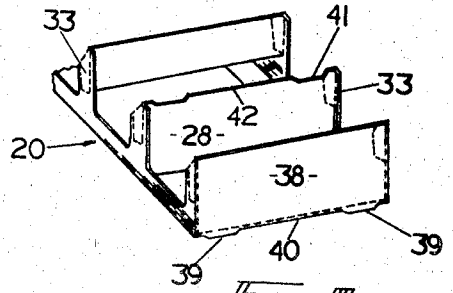


Fig-9

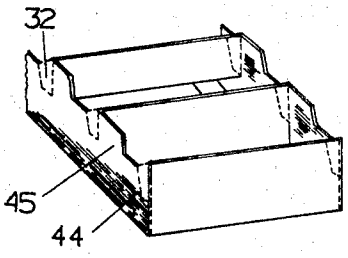


Fig-10

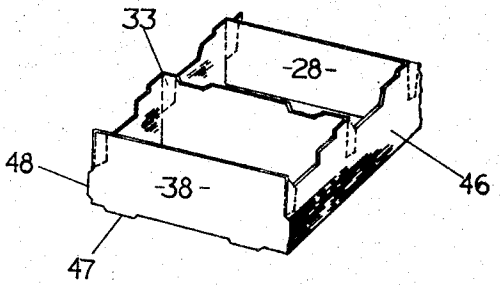


Fig-11

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CARTONS

Filed Aug. 10, 1967 5 Sheets-Sheet 3

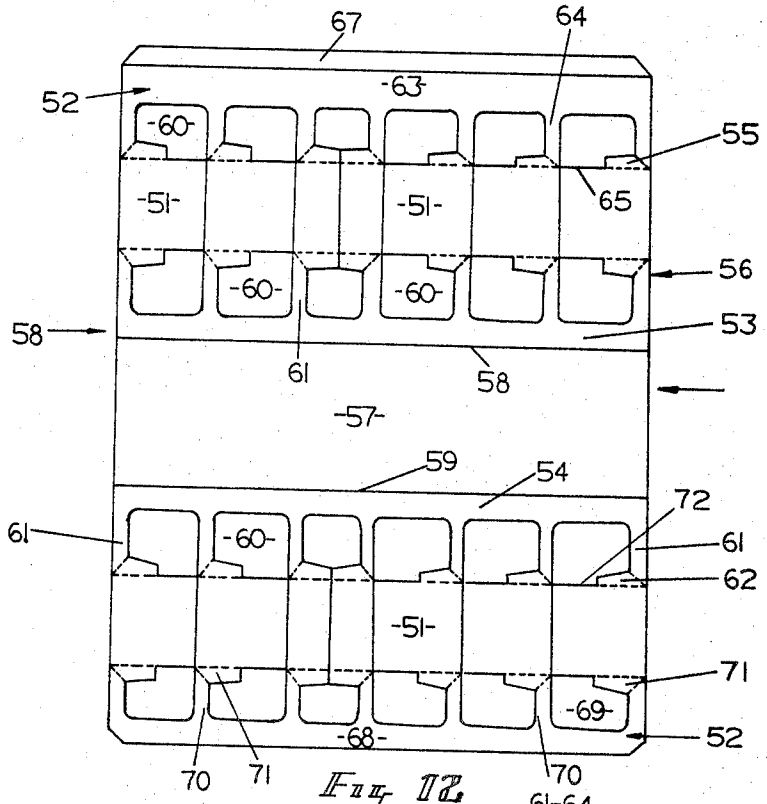


Fig. 12.

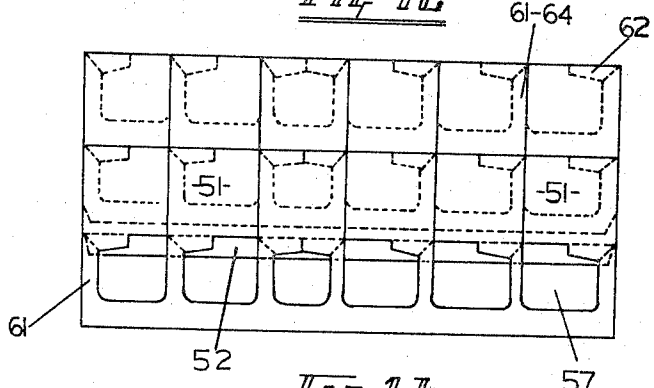


Fig. 13

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Sept. 10, 1968 D. WAINBERG 3,400,876

CARTONS

Filed Aug. 10, 1967 5 Sheets-Sheet 4

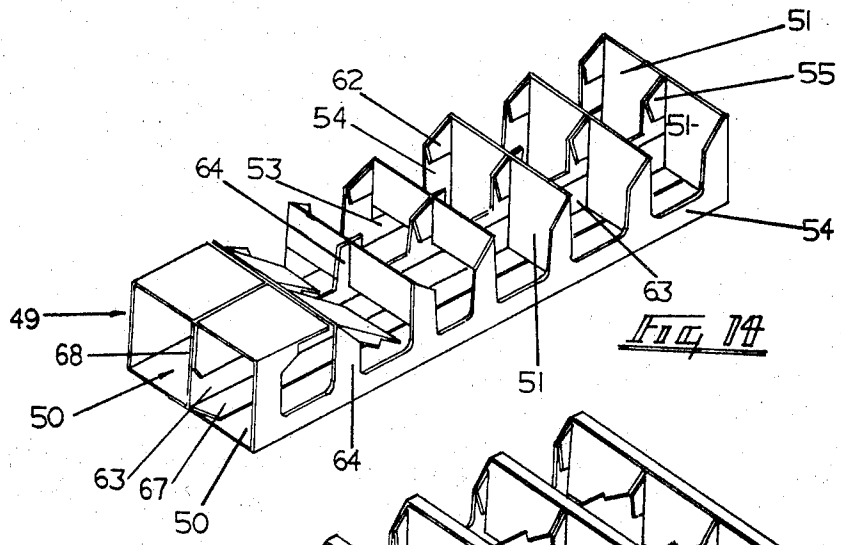


Fig. 14

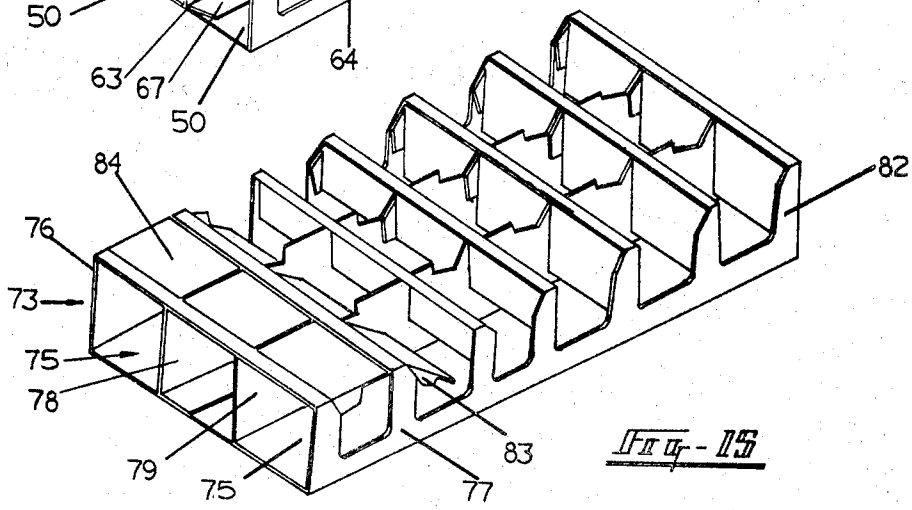


Fig. 15

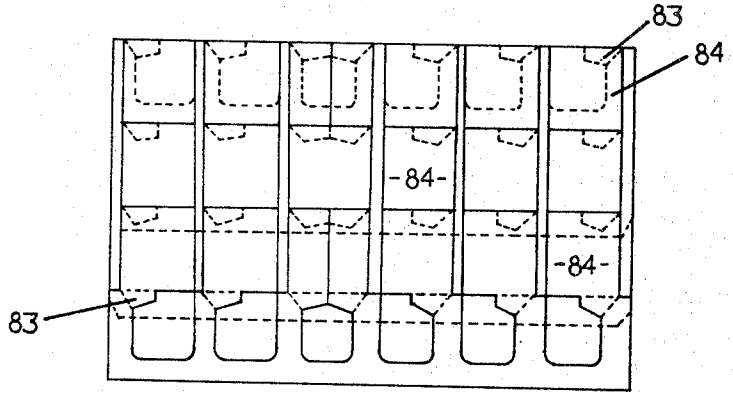


Fig. 16

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Sept. 10, 1968 D. WAINBERG 3,400,876

CARTONS

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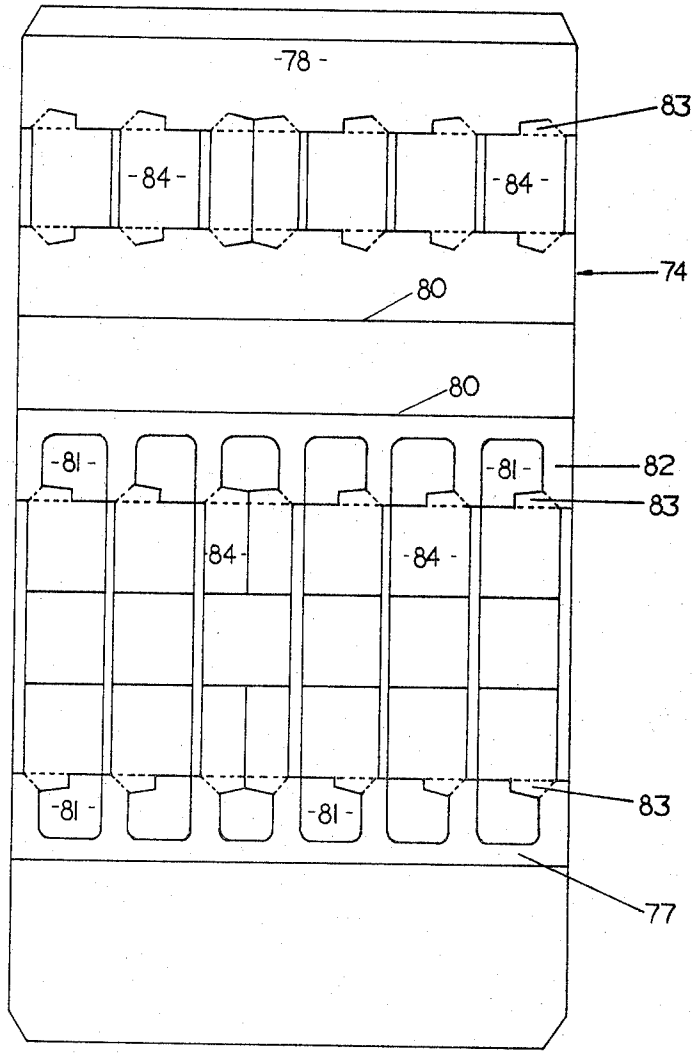


Fig-11

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Patented Sept. 10, 1968

3,400,876

CARTONS

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Filed Aug. 10, 1967, Ser. No. 665,661
5 Claims. (Cl. 229—28)

ABSTRACT OF THE DISCLOSURE

The invention refers to a carton made from a one piece pre-cut blank and in which the bottom wall is flanked by integral longitudinal upright walls, the upright walls having cutout portions to form parallel upright poses with their upper ends integrally connected with lateral extensions, which in turn are integrally connected to transverse members that extend across the width of the carton. The transverse members are in a horizontal position prior to carton erection and having their lateral extensions in approximately vertical alignment with the upright posts, the extensions adapted to be expanded outwardly from the transverse members during application of pressure against the transverse members for changing their horizontal positions to appoximately vertical positions and adapted to swing inwardly for back-to-back abutment with the inner faces of the upright posts and thereby automatically self-locking the transverse members with the posts and completing the erection of the carton.

The invention relates to improvements in cartons as described in the present specification and illustrated in the accompanying drawings that form a part of the same.

The invention consists essentially in the novel features of construction as pointed out broadly and specifically in the claims for novelty following a description containing an explanation in detail of acceptable forms of the invention.

In the past, cartons formed from pre-cut blanks have been constructed with transverse partitions that are hingedly connected to the side walls of the carton by webs which will permit the free lateral movement of the transverse partitions in either direction in the carton. Such type of cartons simply utilize their transverse partitions as spacer walls for separating the comestibles or other articles, that may be inserted in the carton, from one another and lack the necessary resiliency and restraint for mantaining the contents of the carton in approximately vertical setup positions. Other types of cartons include longitudinal partitions for engaging with the transverse partitions so as to secure them in a fixed position.

In such instances the cartons do not adequately protect their contents and necessitate the use of high grades of paperboard and the use of more material in their manufacture, and which often increases their costs of manufacture and assembly to such an extent that they are almost to prohibitive for what they are to be used for.

It is therefore the purpose of this invention to permit the use of low grades of paperboard, when required, by providing a carton with transverse partitions having reversible snap hinge members integral with longitudinal walls of the carton that will not only strengthen the carton but maintain the transverse partitions in approximately resiliently fixed upright positions so as to keep the contents of the carton from unnecessary shifting from their located positions.

Among the objects of the invention are to devise a carton, made from a one-piece pre-cut blank, which is simple and yet sturdy and durable in construction, economical in material and cost of manufacture, which may be shipped conveniently and capable of being quickly and easily set up in condition for reception of the intended comestibles or other articles.

Another object of the invention is to provide an improved carton having an interior assembly which will give the utmost protection to the contents carried therein during transportation, storage or display.

Still another object of the invention is to provide a carton with integral transverse partitions which will self-lock themselves into approximately rigid upright positions and which place the load directly on the bottom of the carton, instead of transmitting it to the side walls.

A still further object of the invention is to construct a carton provided with longitudinal walls, side panels or posts to which transverse partitions are integrally connected by reversible snap hinge members which will effect the required resiliency to the transverse partitions to snap them from a horizontal position to a fixed vertical position in the setting up of the carton.

Other objects of the invention will be apparent from the description of the disclosures of the invention and the illustrations thereof.

In the drawings:

FIGURE 1 is a plan view of the pre-cut blank from which the carton is formed.

FIGURE 2 is a plan view of the pre-cut blank, as illustrated in FIGURE 1, folded and completed into a collapsed position, ready to be set up or erected into a formed carton.

FIGURE 3 is a fragmentary perspective view of the erected carton illustrating various positions of the transverse partitions.

FIGURE 4 is a fragmeintary perspective detail of one end of a transverse partition integrally connected with a post of the carton by a snap hinge member and extending therefrom in a approximately horizontal position.

FIGURE 5 is a similar view to FIGURE 4 showing the hinge member being reversed to snap the transverse partition towards an approximately upright position.

FIGURE 6 is a similar view to FIGURE 4 showing the hinge member snapped into a reversed position and causing the transverse partition to resiliently self-lock itself into an upright position.

FIGURE 7 is a perspective view of the setup carton.

FIGURE 8 is a fragmentary perspective view of one end of the carton and in which the end transverse partition is provided with lateral flanges.

FIGURE 9 is a fragmentary perspective view of one end of the carton and in which the end transverse partition is provided with downwardly projecting flanges.

FIGURE 10 is a fragmentary perspective view of one end of a modified form of carton and in which the transverse partitions are integrally connected to side walls of the carton by the reversible snap hinge members.

FIGURE 11 is a fragmentary perspective view of one end of a modified form of carton and in which the end transverse partition is provided with integral lateral and downwardly projecting flanges.

FIGURE 12 is a plan view of a modified form of the pre-cut blank from which a carton having a double row of compartments is formed.

FIGURE 13 is a plan view of the pre-cut blank, as il-

lustrated in FIGURE 12, folded and completed into a collapsed position, ready to be set up or erected into a formed carton.

FIGURE 14 is a perspective view of the setup carton as formed from the pre-cut blank as illustrated in FIGURE 12 and having one end wall removed.

FIGURE 15 is a perspective view of a further modification of the carton having multiple rows of compartments and having one end wall removed.

FIGURE 16 is a plan view of the pre-cut blank for the carton as illustrated on FIGURE 15.

FIGURE 17 is a plan view of the pre-cut blank for the carton, as illustrated in FIGURE 15, folded and completed into a collapsed position, ready to be set up or erected into a formed carton.

Like numerals of reference indicate corresponding parts in the various figures.

The description of the various parts of the carton will hereinafter be described as being semi-completed or completed assembly or in a setup position.

Referring to the drawings, the carton, as indicated by the numeral **20**, is formed of a bottom wall **21** having a longitudinal folding line **22** from which extends the integral side wall **23** and a longitudinal free edge **24** that is engaged with and is secured to the longitudinal glue flap **25** which is integral with and extends from the longitudinal lower fold **26** of the opposing side wall **27**.

The side walls **23** and **27** are integrally connected to one another by the self-locking transverse members **28** consisting of panels, transverse walls and end walls, partitions, separators and the like for dividing the interior of the carton into compartments **29**. These side walls **23** and **27** have a plurality of cutout portions **30** from which the upright posts **31** and the reversing snap hinge members **32** are formed and act as integral supports for the self-locking transverse members and their incurvation.

Each of the reversing snap hinge members **32** consists of a lateral extension **33** to the transverse member **28** and from which it is bendable at the longitudinal hinge crease line **34** and which is also integral with and diagonally bendable from the post **31** at the diagonal or oblique hinge crease line **35**. In this way, the integral reversing snap hinge members **32** actually embody the transverse members **28** and the posts **31** as movable portions for the actuation of the hinge members and effect the self-locking of the transverse members in their relatively fixed upright positions.

In the formation of the pre-cut blanks into a collapsed carton, the bottom wall **21** and the integral side wall **23** are folded inwardly along the aforementioned longitudinal hinge crease lines **34** so that they will abut the inner surfaces of the transverse members **28** and their integral opposing side wall **27**, the longitudinal free edge **24** of the bottom wall taking an aligning position with the longitudinal fold line **26** formed between the side wall **27** and the glue flap **25**; the glue flap is then folded over the free edge **24** of the bottom wall and is suitably adhered thereto.

The carton in its collapsed position is now ready to be set up either by manual or mechanical means into an erected carton. This is accomplished by simply engaging with one or both sides of the side walls of the carton and exerting pressure thereagainst, thereby automatically raising the side walls into upright positions. At this point of erecting the carton, the transverse members are in a horizontal and parallel position with the bottom wall of the carton. Further manual or mechanical means are then applied to the self-locking transverse members for forcing them downwardly and inwardly.

As the self-locking transverse members **28** are forced inwardly from approximately horizontal positions towards approximate vertical positions by manual or mechanical means, the lateral extensions **33** of the reversing snap hinge members **32** will automatically flex themselves outwardly from the integral joinders with the transverse

members **28** at their longitudinal or straight hinge crease lines **34**. Simultaneously the lateral extensions **33**, through their integral joinders at the diagonal or oblique hinge crease lines **35** with the upper portions of the upright posts, will cause a twist torsional strain to the posts which will create a yielding resilience and resistance tension to the pressure force exerted against the flat front surface of the transverse members **28** as they are pressed and pushed towards the direction of the location of the integral and parallel supporting posts.

This will create resilient deformations to the upper portions of the posts so that as the transverse members are pressed rearwardly to an approximately vertical position their lateral extensions will reverse their direction of movement to flip or fold back upon themselves so as to engage and abut the inner faces of the upright posts and automatically self-lock the transverse members with the upright posts so as to remain and be maintained in a fixed position and presented from being moved further back after they have reached their predetermined upright positions.

It will be noted that the transverse members **28**, while being maintained in relatively fixed positions, will provide lateral rigidity to the carbon and simultaneously augment to the longitudinal rigidity of the carton through strengthening the posts and side walls of the carton, and thereby materially reducing to a minimum any twisting or distortion of the carton in either the lateral or longitudinal directions. This is accomplished by the reversal and abutting positions of the lateral extensions of the transverse members against the inner surfaces of the posts **31** and the side walls **23** and **27** and which have now absorbed the resiliency and upper deformations of the posts. If and when it is desirable for one purpose or another to return one or more of the transverse members to a horizontal position, a light flip to the bottom rear face of the transverse member will cause the abutting release of the transverse member's lateral extensions from engagement with the upright posts and walls, and resiliently spring back to its approximate horizontal position.

In the majority of instances it has been found that the self-locking transverse members **28** are sufficient in themselves to maintain fixed upright positions in the erected position of the carton and which includes the transverse members that form the end transverse walls of the carton. However, in certain types of cartons, it may be desirable to provide a means for presenting the transverse members, in their upright positions, from moving in either direction, such as when they are used to form the end walls **36**, an example of which is shown in FIGURE 8.

In FIGURE 8, a transverse wall in the form of a self-locking end wall **36** is provided with integral lateral flanges **37** that are situated adjacent to the reversing snap hinge members **32**. These lateral flanges **37** are adapted to project slightly beyond the outer vertical plane of the side walls and accompanying posts so that when the end transverse walls **36** are moved into upright self-locked positions, as hereinbefore mentioned, the lateral flanges **37** thereof are forced past the outer vertical edges of the side walls and their integral posts, and thereafter automatically expand beyond the vertical edges and thereby preventing the end transverse walls **36** from being moved inwardly into the carton, at the same time the end transverse walls are prevented from moving outwardly through the self-locking means of the transverse members of walls, as hereinbefore described.

In FIGURE 9, a slight modification for preventing the outward movements of the end transverse walls **38** is shown, in which the restraining flanges **39** project from the inner longitudinal edges **40** of the end transverse walls **38** and are notched out at **41** from the outer longitudinal edges **42** of the adjacent transverse member **28**. These transverse end walls **38** are arcuately swung out-

wardly by manual or mechanical force and against resilient and tensional strain of the self-locking means of the transverse end wall so that the restraining flange **39** will be moved beyond the transverse outer edge **43** of the bottom wall **21** of the carton and project downwardly therefrom to form legs and at the same time present the transverse end wall from being moved inwardly.

In FIGURE 10, a slight deviation of the invention is illustrated, in which a greater depth is provided from the side walls **44** of the carton and the height of the integral posts **45** is shorter than previously described. The integral arrangements of the reversing snap hinge members are the same as shown in FIGURE 1 to 9 inclusive, which are for cartons of comparatively shallow depth.

In FIGURE 11, the modification of the invention is similar to FIGURE **10** as it illustrates a carton having comparatively deep upright walls **46** and in which the end transverse walls utilize downwardly projecting flanges **47** for the formation of legs, and lateral flanges **48**, which is the combination of FIGURES 8 and 9.

In FIGURES 12, 13 and 14 there is illustrated a carton **49** incorporating the invention and utilizing a double row of individual compartments **50**, each compartment being divided by individual integral transverse members **51** and longitudinal partitions **52** and side walls **53** and **54**, all integrally joined to one another through integrally reversing snap hinge members **55**.

The pre-cut blank **56** for the formation of the carton **49** consists of a bottom wall **57** having longitudinal and parallel folding crease lines **58** and **59** separating it from the integrally articulating side walls **53** and **54** respectively. The side walls **53** and **54** have a plurality of cut-out portions **60** from which the integral upright posts **61** and the reversing snap hinge members **62** are formed and operate as integral supports and control of the movements for the individual self-locking transverse members.

The inner longitudinal wall or partition **63** is integral with the transverse members **51** through the integral upright posts **64** and the reversing snap hinge members **55** that are formed from cutout portions of the inner longitudinal wall or partition **63** and is longitudinally foldable along the longitudinal intermittent crease line **65**. A longitudinal glue flap or strip **67** extends along and is integral with the lower extremity of the inner longitudinal wall **63** and is adapted to be adhered or otherwise secured to the bottom wall **57** of the carton **49**.

The inner longitudinal wall or partition **68** has the cutout portions **69** from which are formed the posts **70** and the integral reversing snap hinge members **71** that are integral with the self-locking transverse members **51**, and which in turn are integral with the side wall **54**, and foldable therefrom along the intermittent crease line **72**. The lower longitudinal portion of the inner wall or partition **68** is provided with an adhesive surface situated below the cutout portions **69** and is for the purpose of securing the inner longitudinal wall **68** to the longitudinal inner wall **63**, and thereby completing a row of individual compartments.

In FIGURES 15, 16 and 17 a further modification of the carton is illustrated, in which the carton is divided into a triple row of independent compartments. As in the forms of the invention already described and shown in the accompanying drawings, the carton **73** is formed from a pre-cut blank **74** made of a single piece of material, such as cardboard, and consists of the bottom wall **75**, the side walls **76** and **77** and the longitudinal partition walls **78** and **79**, all integral with one another and separated from each other by the longitudinal folding crease lines **80**.

The side walls **76** and **77** and the longitudinal partition walls **78** and **79** have cutout portions **81** which are transversely parallel to one another, and from which the integral upright posts **82** and the reversing snap hinge members **83** are formed and operate as integral supports and control of the movements for the individual self-locking transverse members **84**, which are integral with the supporting posts and the reversing snap hinge members, and the assembly and erection of this carton is similar to the setting up of the other cartons already described.

The materials used for making the pre-cut blanks for the cartons are of course diversified, such as stiff cardboard, pasteboard, boxboard, plastic, aluminum, composite material and others that lend themselves to be made from a blank that may be foldable to form the required configurations of the cartons.

Since changes may be made in the above structures and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What I claim is:

1. A carton made from a one-piece pre-cut blank and comprising a bottom wall, longitudinal walls integrally connected with said bottom wall and having a plurality of parallel cutout portions, integral upright posts and reversing snap hinge members formed from the cutout portions of said longitudinal walls, transverse members integrally connected with said reversing snap hinge members and forming with said longitudinal walls a plurality of compartments, and characterized by the fact that said reversing snap hinge members consist of lateral extensions integral with the side extremities of the transverse members and located adjacent to the upper corners thereof and separated and articulated therefrom by longitudinal crease fold lines and angularly and integrally joined to the upper portions of said upright posts and separated and articulated therefrom by diagonal crease fold lines which extend from the ends of the longitudinal crease fold lines situated at the upper corner junctions of said lateral extensions and transverse members and which terminate at their other ends at the inner corner junctions of said upright posts and said transverse members.

2. A carton as claimed in claim **1**, characterized by the fact that said transverse members are in horizontal position prior to carton erection and having their lateral extensions in approximately integral vertical alinement with said upright posts, said lateral extensions adapted to be expanded outwardly from said transverse members during application of pressure against said transverse members for changing their horizontal positions to approximately vertical positions and adapted to swing inwardly for back-to-back abutment with the inner faces of said upright posts and automatically self-lock said transverse members with said posts and completing the erection of said carton.

3. A carton as claimed in claim **2**, characterized by the fact that the upper portions of said upright posts are deformed during the change of angular directions of said lateral extensions and effecting resiliency of movement to said transverse members.

4. A carton made from a one-piece pre-cut blank comprising a bottom wall, integral side walls and inner longitudinal partitions forming a continuous part of said bottom wall and having a plurality of parallel cut-out portions, integral upright posts and reversing snap hinge members formed from the cut-out portions of said side walls and said inner longitudinal partitions, self-locking transverse members integrally connected with said reversing snap hinge members and forming with said side walls and said inner longitudinal partitions a plurality of compartments, and characterized by the fact that said reversing snap hinge members consist of lateral extensions integral with the side extremities of the transverse members and located adjacent to the upper corners thereof and separated and articulated therefrom by longitudinal crease fold lines and angularly and integrally joined to the upper portions of said upright posts and separated and articulated therefrom by diagonal crease fold lines which extend

from the ends of the longitudinal crease fold lines situated at the upper corner junctions of said lateral extensions and transverse members and which terminate at their other ends at the inner corner junctions of said upright posts and said transverse members, and said inner longitudinal partitions being integrally connected to said side walls through said snap hinge members and said self-locking transverse members and adhesively secured to said bottom wall.

5. A carton as claimed in claim 4, characterized by the fact that each of the compartments is formed with opposing individual self-locking transverse members and the other remaining walls are formed by the rigid side walls and inner longitudinal partitions.

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DAVID M. BOCKENEK, *Primary Examiner.*