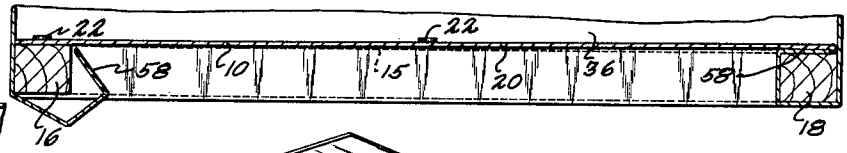
Jan. 26, 1965 T. MUNROE 3,167,234

WOOD REINFORCED SHIPPING CARTON

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Fig-4



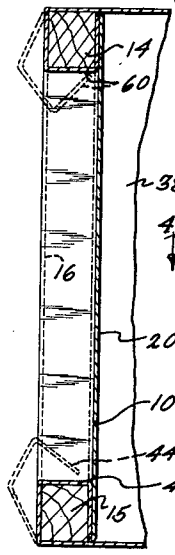
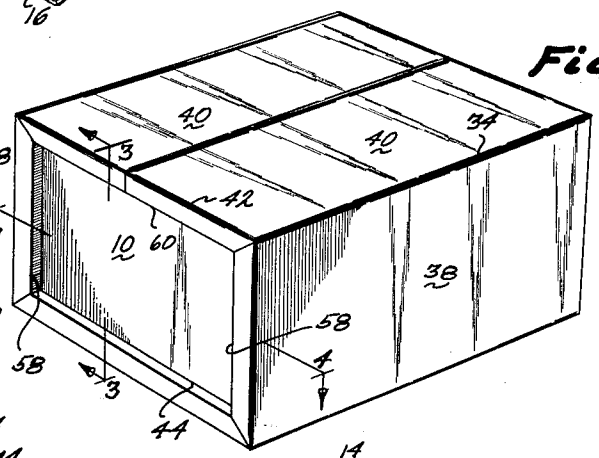


Fig-1



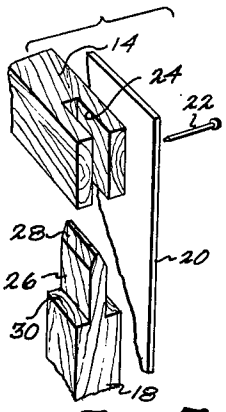


Fig-3

Fig-5

Fig-2

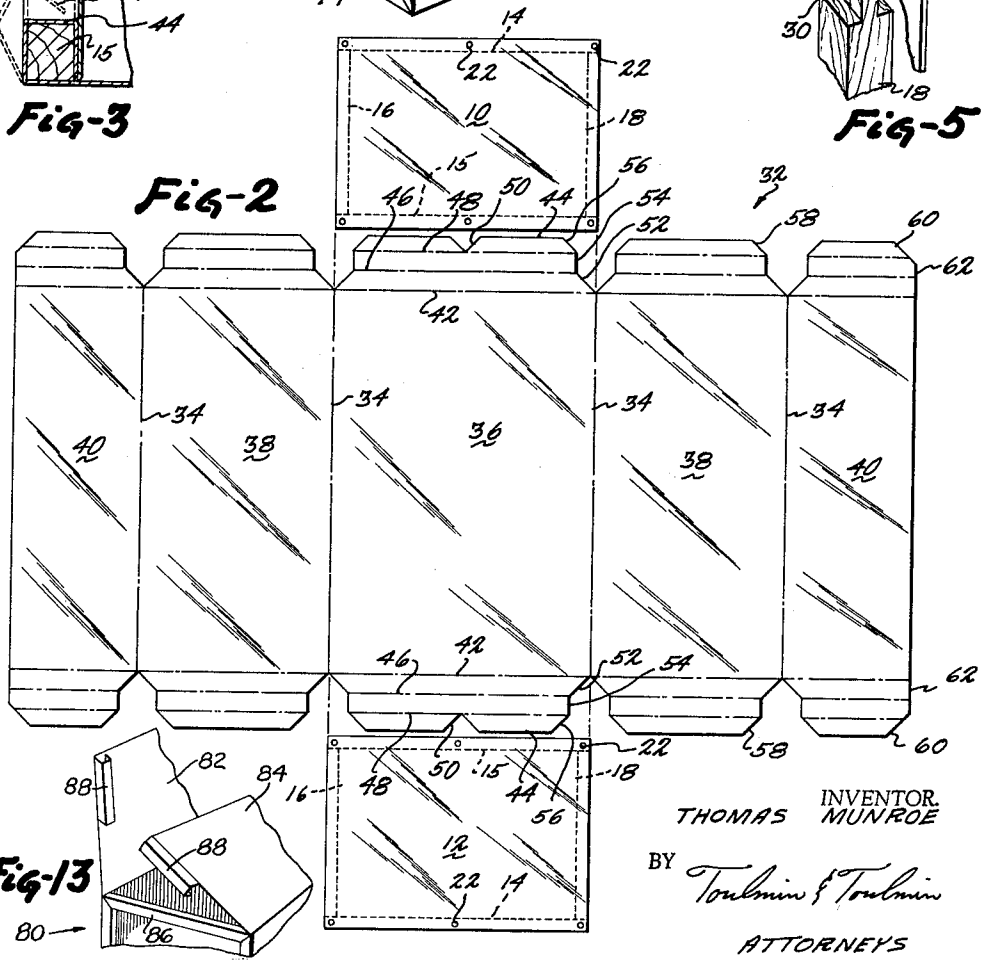


Fig-13

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WOOD REINFORCED SHIPPING CARTON

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Fig-6

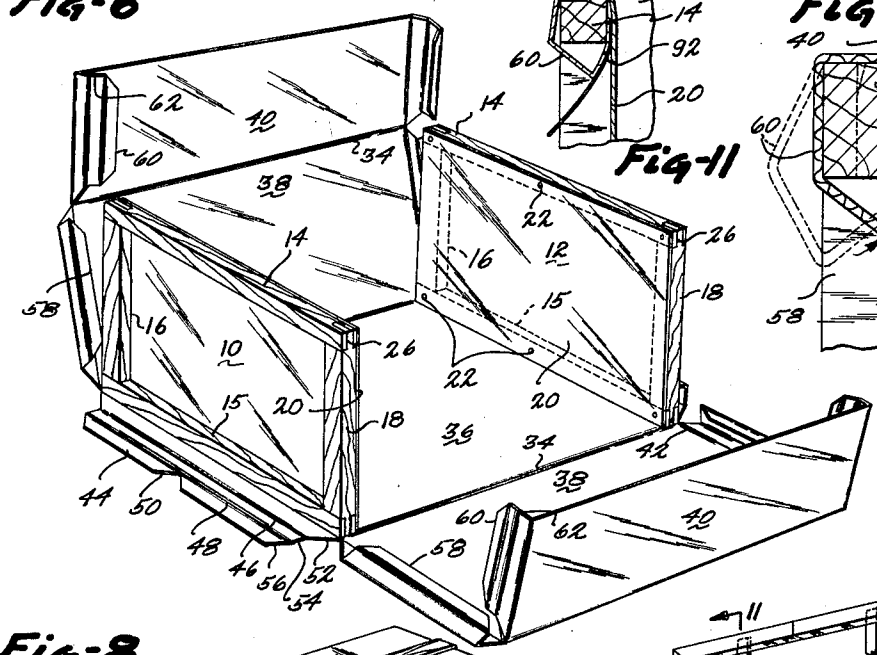
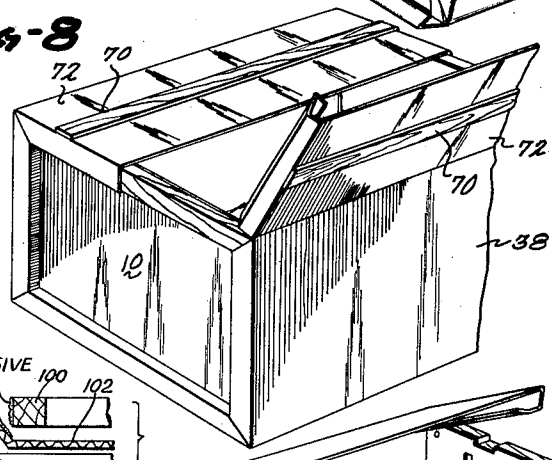


Fig-11

Fig-7

Fig-8



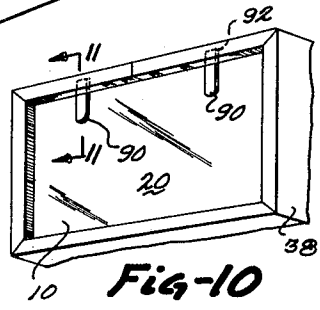


Fig-10

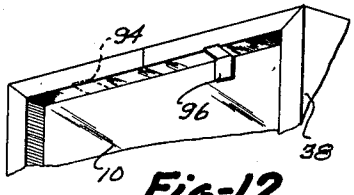


Fig-12

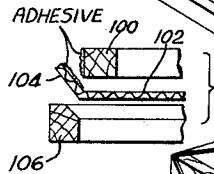


Fig-14

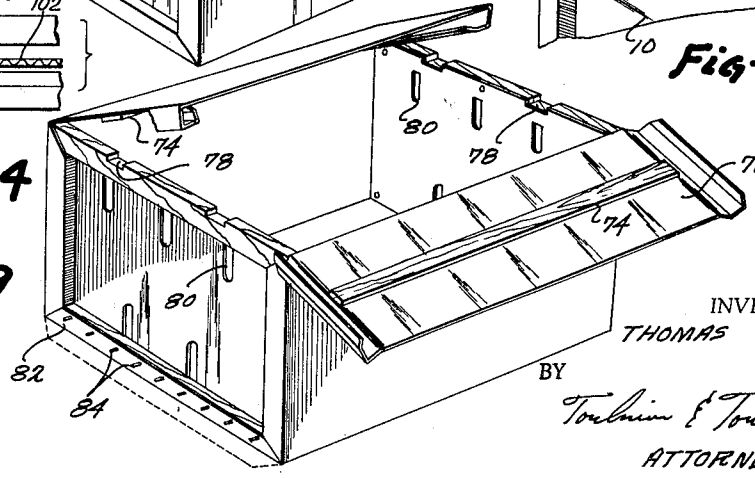


Fig-9

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United States Patent Office 3,167,234 Patented Jan. 26, 1965

3,167,234

WOOD REINFORCED SHIPPING CARTON

Thomas Munroe, Dayton, Ohio, assignor to Moraine Box Company, Dayton, Ohio, a corporation of Ohio

Filed Apr. 1, 1963, Ser. No. 269,822
6 Claims. (Cl. 229—23)

This invention relates to cartons and particularly to corrugated paper cartons having wood reinforced panels therein, and more particularly still, the invention relates to a carton of the nature referred to in which the carton can be made up and closed without the use of nails or staples or adhesives or any other separate fastening means.

Boxes and cartons which can be closed without the use of any fastening means are, of course, known with respect to smaller cardboard cartons that are employed, particularly in retail establishments, for carrying light articles. Cartons or boxes of this nature usually have interlocking tabs or slots for interconnecting closure flaps so that no fastening means are required.

It is also known to provide small corrugated paper cartons in which articles of commerce, such as small electric motors and the like are placed in which no nails or other fastening means are required, but wherein the closure flaps for the carton are either glued closed or are taped closed.

To my knowledge, however, there has never been a carton of the corrugated paper type having wood reinforced panels in which the carton can be set up and closed without the use of any fastening means whatsoever. It is in connection with a carton of this type that the present invention is primarily concerned.

The carton of the present invention is somewhat related to the cartons disclosed in my issued Patents 3,029,995 and 2,972,440 wherein a corrugated paper blank is provided that makes up three or four sides of a carton and which completed carton includes at least two reinforced panels to which the other panels of the carton are attached by nails or staples. The present invention represents a departure from the invention disclosed in the patents referred to above in that, while a corrugated paper blank is employed for making up the carton and in combination with wood reinforced panels, there is no stapling or nailing required to connect the wood reinforced panels to the other panels of the carton either for assembling the carton initially or for setting the carton up and closing it.

With the foregoing in mind, a primary object of the present invention is the provision of a carton which can be made up and closed ready for shipment without using any nails or staples or other fasteners or without requiring any machines for fastening the several panels of the carton together.

Another object of this invention is the provision of a corrugated paper carton arrangement that can be manufactured and shipped flat and which can readily be set up at the point of use without any tools and then closed up ready for shipment without the use of any tools or fasteners.

The foregoing objects as well as other objects and advantages will become more apparent upon reference to the following specification taken in connection with the accompanying drawings in which:

FIGURE 1 is a perspective view showing a carton according to the present invention set up and closed ready for shipment;

FIGURE 2 is a plan view showing the basic corrugated paper blank from which the carton is made and the wood reinforced end panels that close the ends of the carton;

FIGURE 3 is a vertical sectional view indicated by line 3—3 on FIGURE 1 showing the one end panel and

the connection thereof to the top and bottom walls of the carton;

FIGURE 4 is a plan sectional view indicated by line 4—4 on FIGURE 1 showing the same wood reinforced end panel of the carton and the manner in which the front and back panels of the carton blank are connected thereto;

FIGURE 5 is a fragmentary perspective view showing how the wood rails reinforcing the end panels are joined and are connected to the corrugated paper member which, together with the rails, makes up the end panel;

FIGURE 6 is a perspective view of the carton of FIGURE 1 showing it in the process of being set up;

FIGURE 7 is a fragmentary view drawn at enlarged scale and showing the top panel of the carton being joined to the top rail of one of the end panels;

FIGURE 8 is a perspective view of a modified form of the carton in which the top divided panel is reinforced with wood rails;

FIGURE 9 is a view like FIGURE 8 but shows how the reinforcing of the parts of the top panel could be applied to the underneath side thereof;

FIGURE 10 is a perspective view showing one end of a carton having pull tabs by means of which the carton can be easily opened;

FIGURE 11 is a sectional view indicated by line 11—11 on FIGURE 10;

FIGURE 12 is a view like FIGURE 10 but showing a modified arrangement;

FIGURE 13 is a fragmentary perspective view showing another modified arrangement; and,

FIGURE 14 is a fragmentary view showing a different manner of forming the wood reinforced end member.

Referring to the drawings somewhat more in detail, and with particular reference to FIGURES 1 thru 7, the carton according to the present invention comprises wood reinforced end panels 10 and 12. Each of these panels consists of a top rail 14, a bottom rail 15, and end rails 16 and 18 all of wood, forming a rectangle and having attached thereto a corrugated paper member 20. According to the preferred form of the present invention, member 20 is connected to wood rail frame by six nails or fasteners 22 which are located in the corners of the end panels and intermediate the ends of the top and bottom rails.

As will be seen in FIGURE 5, the rails in the corners of the end panels are employed not only for holding the corrugated paper member 20 to the rails but also serve to interconnect the top and bottom rails with the end rails. These rails are advantageously formed so that one has a groove or slot 24 therein and the other has a tongue or tenon 26 that is receivable in the slot. Preferably the tongue is tapered at the ends as at 28 so that it can be formed for a close fit in the slot but can be easily inserted therein. This arrangement, particularly where the shoulder 30 at the base of the tongue abuts the adjacent top or bottom rail, provides for an extremely rigid end panel structure.

The end panels, which are identical for both ends of the carton, are joined with the main carton blank to make up the completed carton. The main blank is illustrated in developed form in FIGURE 2 and is adapted for forming the bottom, side and top walls of the carton, as will be seen in FIGURES 1 and 6. This blank is generally indicated at 32 and comprises a rectangular sheet of corrugated paper scored along lines 34 so as to be readily foldable, said score lines defining the bottom panel 36, the side panels 38 and the two half panels 40 which, together, make up the top panel of the carton.

Extending from each of the aforementioned panels are flaps which are joined with the panels 36, 38 and 40

by the score lines **42**. The flaps for the bottom panel **36** are indicated at **44** and are themselves scored at **46** and **48** so that the flaps can be formed around the wood rails of the end panels, as will be explained more fully hereinafter. The flaps on the opposite ends of the bottom panel **36** are centrally notched as at **50**, and have their ends formed inwardly at an angle as at **52** adjacent flap **36**, and then having a straight portion **54** and a final tapered corner **56**. The formation of the ends of the flaps are required so that when the carton blank is folded up, the end flaps can be formed around the wood rails without interfering with each other.

Extending from opposite ends of the side panels **38** of the carton blank are flaps **58** formed similarly to the flaps **44** except having no central notch, and extending from the ends of the panels **40** are the flaps **60** which are similar to the aforementioned flaps **44** and **58**, except that flaps **60** along their outer edge are preferably straight as at **62**, because these edges will be located in the middle of the top rail and do not have to be cut away for clearance.

Referring now to FIGURES 3, 4, 6 and 7, it will be seen that to make up a carton, the blank **32** is assembled with the end panels by forming the carton around the end panels and by forming the flaps **44**, **58** and **60** around the wood rails, and inserting the outermost portions of these flaps between the wood rails and the corrugated paper members **20** that are attached to the inside faces of the rails. This is perhaps brought out in FIGURE 7 wherein a typical connection of the nature referred to is illustrated. In FIGURE 7, wherein the rail can be considered to be the top rail **14**, the flap **60** is formed about the rail and the end part of the flap outwardly from the outermost score mark therein and indicated at **64** is being inserted between the corrugated paper member **20** and the rail **14** to which this member is secured by nails or staples. The corrugated paper is relatively stiff so that once the portion **64** of the flap is pushed into the space between member **20** and rail **14**, it is securely held therein and can only be removed by the use of a tool which can be inserted between the formed over flap and the rail to pry the flap out, or else the carton must be cut to get it open. In connection with the flaps formed around the cut rails, it will be appreciated that the notch **50** in the flaps **44** associated with panel **36** are provided for preventing interference between these flaps and the nails holding the members **20** to the bottom rails of the end panels in the middle thereof. The cut off corners of the flaps **62** are provided for this same purpose with respect to the nails in the middle of the top rails.

The carton completely set up as illustrated in FIGURE 1 has all of the panels of the carton blank securely connected with the wood reinforced end panels of the carton and all of the wood is completely enclosed so that the cartons can be manually handled quite comfortably without any danger of picking up splinters. Because of the tight connection between the main carton blank and the cut reinforced end panels, the carton is capable of withstanding considerable abuse without coming apart and, furthermore, the full strength of the materials making up the carton can be developed.

Inasmuch as no nails or other fastening means are required, the carton is extremely inexpensive to manufacture and use. The end panels are fabricated and are only brought together with the main carton blank at the point of use of the carton. The carton can thus be shipped flat, which is conserving of space and shipping costs. No nailing machines or other devices are required at the point of use and the carton can be completely set up and closed manually. In use, the bottom and side panels of the carton would be attached to the end members, the carton will then be filled and the final operation would be the closing of the top of the carton and

the forming of the flaps thereof around the top rails of the end panels.

The top panel means of the carton could, of course, be a single panel if so desired. Further, the possibility presents itself of forming the rails on the end panels of rolled up pieces of corrugated paper which could be integral with the end panels.

It will be understood that, where required, the use of nails and staples in the carton to make the closing thereof more secure is not prevented and, likewise, sealing staples can be applied to close the joint in the top panel as desired or necessary.

It is also contemplated within the provision of the present invention to reinforce the carton additionally with wood strips which might be desirable where the cartons are to be stacked. This could be done by applying the wood strips **70** extending across the parts **72** of the top panel as indicated in FIGURE 8. These wood strips could be grooved, stapled or notched to the top parts of the panel if desired.

It is also contemplated that reinforcing strips **74** of this nature could be applied to the undersides of the part **76** of the top panel as indicated in FIGURE 9, and in which case, the top rails of the end members and the corrugated paper panels secured thereto would be notched out at **78** for receiving the ends of the strips **74**. FIGURE 9 also indicates certain other features that could be included in the carton if desired, these features including ventilating holes **80** which could be formed in any one of the number of carton walls and located where desired. Walls of this nature might be required when the carton is used for shipping fruits or vegetables or the like and could be easily formed in the corrugated paper members at the time of cutting thereof.

FIGURE 9 shows that the bottom panel of the corrugated paper carton blank, instead of having long flaps thereon for wrapping around the bottom rails of the end panels, could have shorter flaps **82** thereon lying along the outside face of the bottom rails of the end panels and connected thereto as by nails or staples **84**. This arrangement will permit the end panels to be joined to the carton blank and held together therewith. The blank and the end panels could be folded for shipment and the setting up of the carton would be the same as illustrated in FIGURE 6 except the bottom panel would already be joined to the end members of the carton by the aforementioned nails or staples **84**.

The nature of the carton of the present invention is such that it lends itself well to packing of household goods and the like for shipping. The cartons are strong and easy to handle and remain securely closed. In connection with work of this nature, however, it is desirable for the cartons to be easily openable without destroying the carton because they can be re-used.

It is also the case that many times when fruits or vegetables or the like are shipped, the receiver might wish to open the carton without damage to it. The opening of the carton can be accomplished by pulling the flaps out that have been tucked in under the wood rails.

One way of doing this is to have a thin metal blade with a short hook on the end which can be slipped under the wood rails so that the hook engages the innermost end of the flap, whereupon the flap can be easily pulled out by the tool. In order to avoid the necessity of using a tool however, the present invention also contemplates modifications such as shown in FIGURES 10, 11 and 12.

In FIGURES 10 and 11, what is dsclosed is pull tabs **90** which are affixed to the flaps at the ends of the two parts of the top panel as indicated at **92** in FIGURE 11. These tabs are cemented or otherwise affixed to the end portions of the flaps and may be adhesively connected to the end members **20** or taped thereto if so desired. These tabs provide an easy means for pulling the flaps out when desired.

Another way in which the carton could be formed so

that it could be opened readily is illustrated in FIGURE 12 wherein the portions of the flap elements that extend over the bottoms of the top wood rails of the end members are scored as indicated at 94 in such a manner that a short tab 96 can be torn out and form a pull tab. The tabs 96 as well as the tabs 90 provide means for pulling straight down on the terminal portions of the flaps and this will easily disengage the flaps from the wood rails and permit the carton to be opened without damage thereto, while at the same time, the provision of the flaps in no way decreases the ability of the carton to remain tightly closed during handling and shipping. All tucked in flaps could have such tabs if desired.

FIGURE 13 shows a somewhat modified arrangement in which a carton 80 according to the present invention has two top panels 82 and 84 each of an extent to extend completely across the top of the carton. With this arrangement the uppermost flap could be provided with marginal portions to form about the top rails 86 of the end members but it is also possible to form the panels as illustrated with a flap 88 on the outer portion of each side edge of the top flaps and in which case each of the top flaps would be securely affixed to top rail 86.

It will be understood that additional nails or staples or adhesives could be employed wherever desired if the carton were to be subjected to rough handling for prolonged periods at a time. Similarly, the wooden frame for the end members could be glued at the corners if desired and this would prevent the nails from becoming loose on account of the carton being abused.

FIGURE 14 illustrates a modified arrangement wherein wood frame 100 for an end member of the carton has the corrugated paper panel 102 secured thereto by forming the panel with edge portions 104 which can be formed over one or more of the faces of the wood frame 100 and secured thereto by nails or staples or adhesive. When secured to the wooden frame by adhesive, the wood frame itself could be assembled with the corners adhesively joined and then it could be pressed together with panel 102 into a confining frame 106 which would hold the frame and panel together until the adhesive set up. This would make an extremely strong end panel and would not in anyway interfere with the connecting of the main panels of the carton blank to the rails of the end members as has been described above.

To summarize, the present invention provides a carton adapted for being manufactured in a variety of sizes and proportions and in connection with which all machinery such as cutting machinery, nailing and stapling machinery, and gluing and stitching devices would be eliminated at the point of use of the carton, and instead, the setting up and closing and locking closed of the carton would be a completely manual operation, which can be done quickly and inexpensively.

It will be understood that this invention is susceptible to modification in order to adapt it to different usages and conditions; and accordingly, it is desired to comprehend such modifications within this invention as may fall within the scope of the appended claims.

I claim:

1. In a carton blank; comprising bottom, side and top panel means hingedly interconnected and forming a substantially rectangular blank, end members for the carton comprising end panels and rigid rails extending along the edges of said panels on the outside each end member having a width corresponding to the width of the bottom panel means and a height corresponding to the height of said side panel means, each said panel means of the blank having flap means hingedly connected thereto and scored along lines parallel to the ends of the panel means and spaced apart to divide the flap means into hingedly interconnected portions, each said flap means being arranged for being formed about the adjacent wood rail of the adjacent end member and the terminal portion of each said flap means remote from the connection of the flap means to the panel being receivable in the region between the said end panel and the rail about which the flap means is formed, the said portion of each flap means adjacent the connection of the flap means with its respective panel means being beveled inwardly toward the center of the respective flap means so said flap means will be in edge to edge engagement when formed about said rails, said flap means having the ends of said terminal portions beveled to facilitate insertion thereof between the rails and the pertaining end panel, means connecting said end panels to said rails comprising connector elements in the corners of the panels which also extend through the rails so as to interconnect the rails at the corners of the panels, and additional connectors intermediate the ends of the top and bottom rails, and the flap means pertaining to the top and bottom panel means being notched intermediate their ends to prevent interference with said last mentioned connectors.

2. A carton according to claim 1 in which at least the terminal portions of said flap means pertaining to said top pull means have pull tabs connected thereto and projecting outwardly from between the respective rail and end panel for disengaging the said flap means from the rails about which they are formed.

3. A carton according to claim 1 in which said top panel means have reinforcing strips extending thereacross from end to end and overlying said end members when said top panel means are folded down at the end members.

4. A carton according to claim 1 in which each said top panel means extends substantially completely across the top of the carton thereby providing for a double-ply carton top, and the said flap means on each of said top panels extending along the length of about one half the top rails of the end members from the outer edges of the respective top panels.

5. A carton according to claim 1 in which said end panels have edge portions formed at least part way around said rigid rails and secured thereto.

6. A carton according to claim 2 in which said pull tab means are portions of the respective flap means formed by cutting the flap means part way around the tab means and turning the tab means out from the flap means.

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