Oct. 13, 1959 J. D. MILLER 2,908,436

MULTI-PLY CARTON CONSTRUCTION

Filed March 3, 1958 3 Sheets-Sheet 1

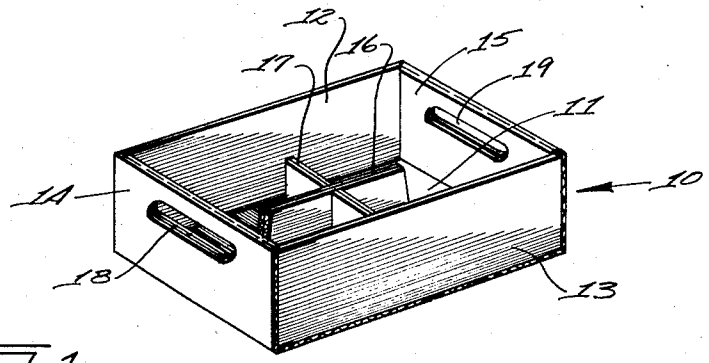
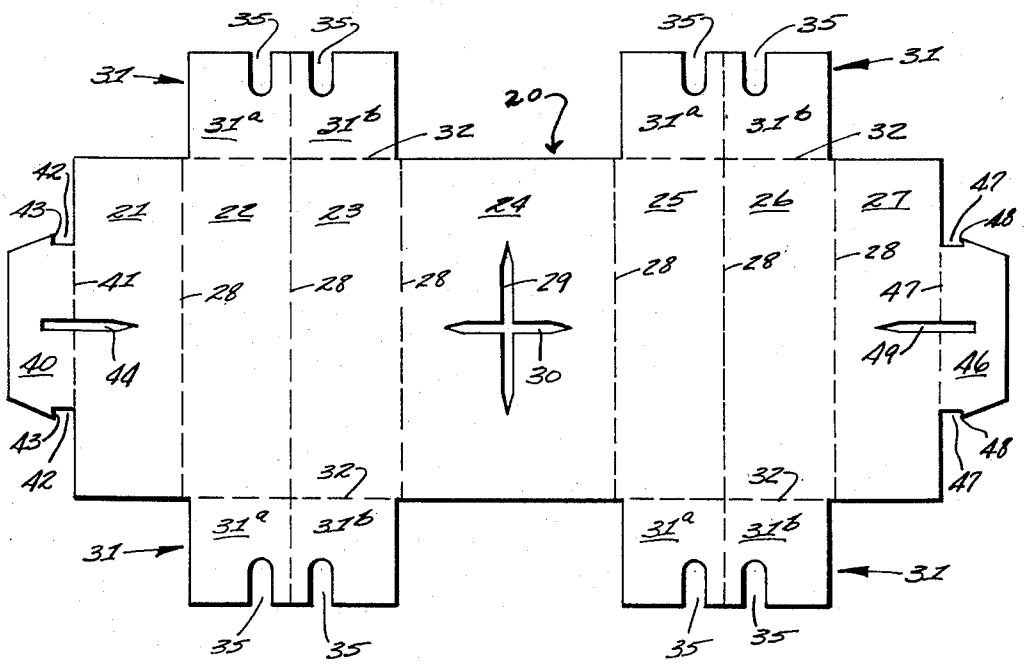


FIG. 1

FIG. 2



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FIG. 3

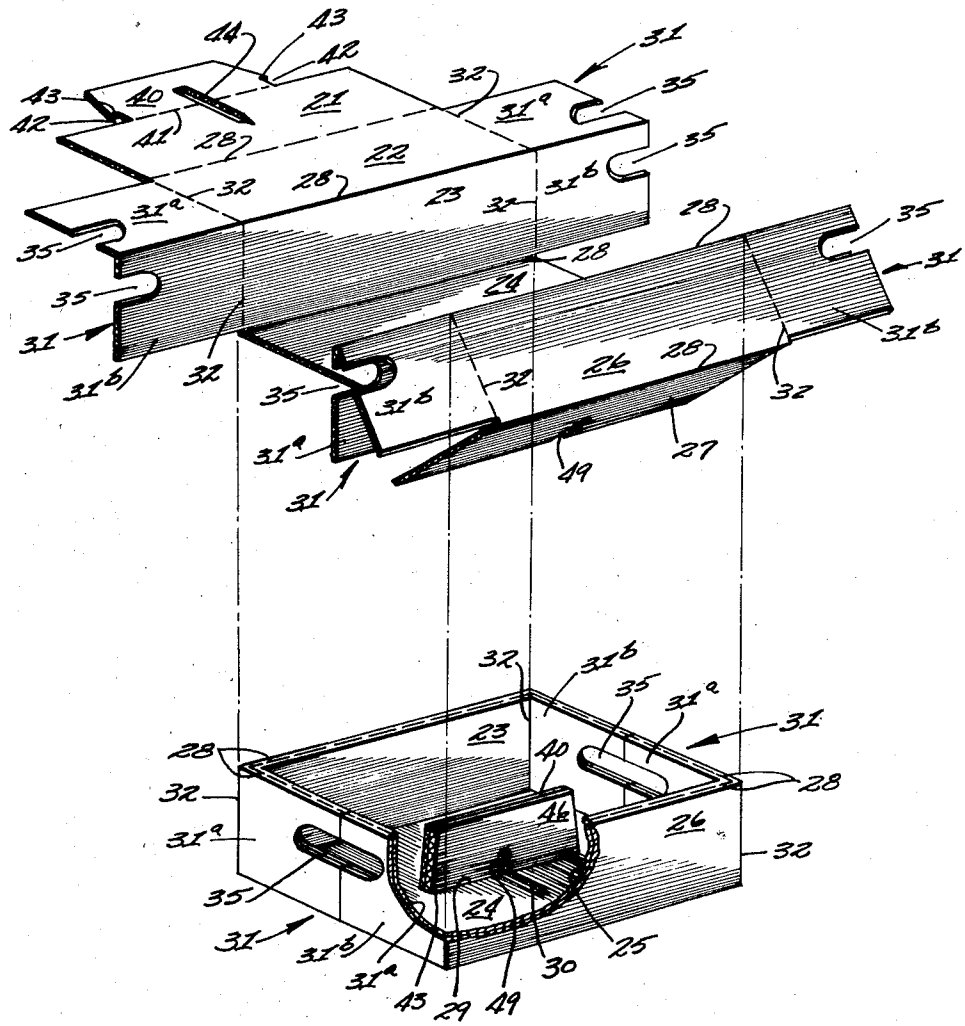


FIG. 4

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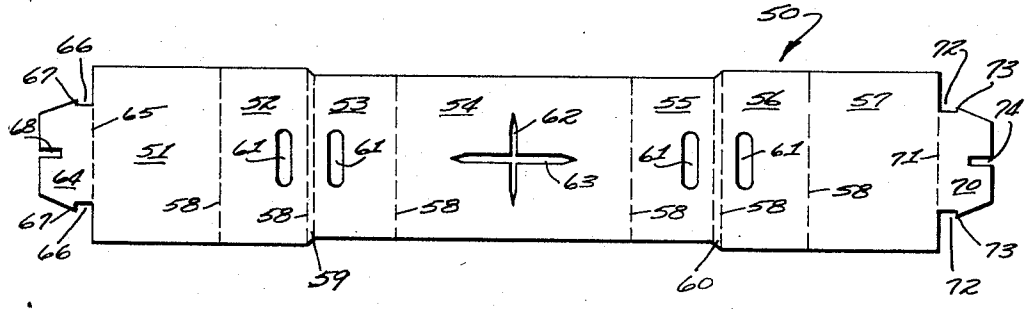
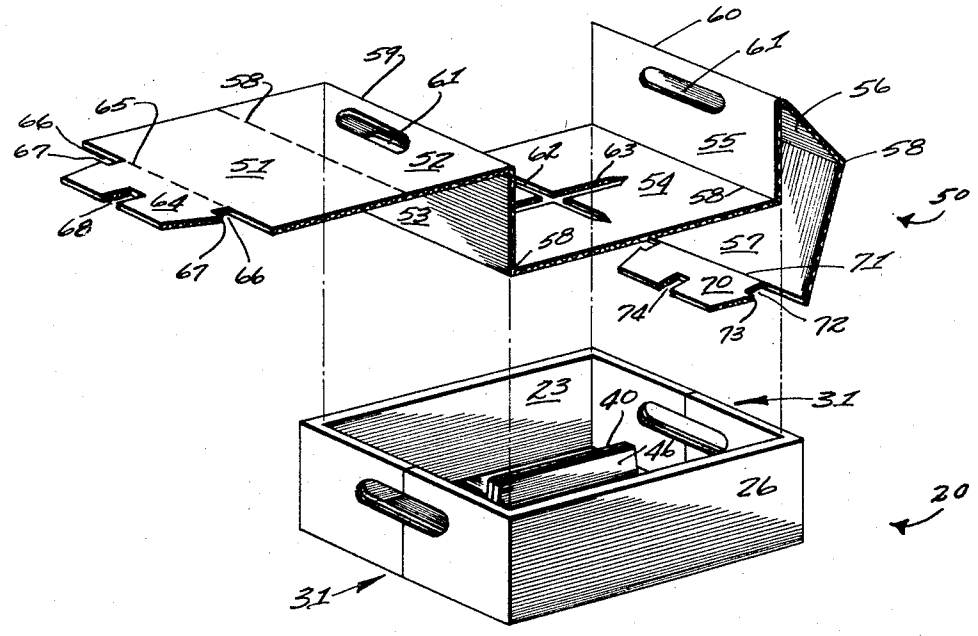


FIG. 5

FIG. 6



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MULTI-PLY CARTON CONSTRUCTION

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Application March 3, 1958, Serial No. 718,581

4 Claims. (Cl. 229—15)

The present invention relates to a carton construction which is formed of a plurality of plies of the material of construction and is designed to include integral partitioning for the purpose of providing a plurality of cells.

Producers of canned and bottled beverages have found that the marketing of such items is enhanced by putting up such items in six-pack form. The usual six-pack consists of six bottles or cans of the product contained in a wrap or light weight box formed of chipboard or cardboard, and which usually includes handles to permit such items to be conveniently carried by the ultimate consumer. These six-packs are conventionally shipped from the manufacturer to the wholesaler and to the dealer in wooden boxes of a size to contain four such six-packs. Obviously, these wooden boxes are expensive, and economically necessitate that these wooden boxes be reused, and, accordingly, they must be shipped back to the manufacturer. There have been previous attempts in the industry in many instances to replace wooden boxes by cartons formed of relatively inexpensive materials, of which corrugated paperboard is the most popular example. Unfortunately, these previous attempts either failed with respect to the strength requirements, have had to resort to auxiliary reinforcing elements of the more ocnventional materials such as wood and the like, or have been of extremely complicated design, which increases the cost of manufacture and frequently involves considerable effort in assembly.

Accordingly, it is an object of this invention to provide a carton construction of a relatively inexpensive material of construction, which carton is of exceptional strength.

It is another object of this invention to provide such a carton which includes partitions which are integrally a part of the main portion of the carton.

It is another object of this invention to provide such a carton which is composed of many plies of the material of construction, yet is of relatively simple design and thereby involves a minimum of waste of the material of construction, and is capable of assembly with a minimum of effort.

It is also an object of this invention to provide such a carton which does not require any auxiliary reinforcing elements of the more rigid materials and does not require any auxiliary fastening arrangements to hold same in assembled form.

These and many other objects of the invention will become apparent to those skilled in the art from the following detailed description, taken in conjunction with the annexed sheets of drawings, on which there is presented for purposes of illustration only, an embodiment of the invention.

In the drawings:

Fig. 1 is a perspective view of the completed carton construction.

Fig. 2 is a plan view of a blank used in forming one component of the carton of this invention.

Fig. 3 is a perspective view of the blank shown in Fig. 2 in an intermediate stage in the erection thereof.

Fig. 4 is a perspective view showing the final form of the erection of the element shown in Figs. 2 and 3.

Fig. 5 is a plan view of the blank which is used in forming the second component of the carton of this invention.

Fig. 6 is a perspective view illustrating how the blank of Fig. 5 is folded and combined with the element of Fig. 4 to produce the completed carton shown in Fig. 1.

Basically, the carton of the present invention comprises a first receptacle defined by a bottom wall, walls upstanding from the perimeter of the bottom wall and internal partitions, a reinforcing element formed of a linear series of foldable panels, one of which is adapted to overlie the bottom wall, two pairs of which are adapted to enclose opposed upstanding walls, another pair of which is adapted to cooperatively reinforce the bottom wall, and a last pair being adapted to project upwardly through slits provided in the bottom wall formers and interfit with the internal partition to thereby yield an interlocked, internally partitioned carton, in which all elements thereof are formed of multiple plies.

Referring now more specifically to the drawings, there is shown in Fig. 1 the completed carton **10** of the present invention. The carton comprises, in general, a bottom wall **11**, opposite upstanding side walls **12** and **13**, opposed upstanding end walls **14** and **15**, and internal upstanding normally disposed partitions **16** and **17**. The walls **14** and **15** are provided with cut-outs **18** and **19**, respectively, which serve as convenient hand holds. The carton **10** is erected from two elements formed of relatively stiff, sheet-like material, for instance, corrugated paperboard. These two elements **20** and **50** are shown, respectively, in knock-down blank form in Figs. 2 and 5.

The blank **20** in Fig. 2 is composed of a linear series of relatively foldable rectangular panels **21**, **22**, **23**, **24**, **25**, **26**, and **27**, separated by score lines **28** in parallel spaced relationship. The centermost panel **24** is provided with a pair of normally intersecting slits **29** and **30**. A flap **31** extends axially from each end of the pairs of panels **22**, **23**, and **25**, **26**, and is separated from the associated panels by a fold line **32**. Score line **28** extends across the score line **32** to divide the flap **31** into two equal parts **31***a* and **31***b*, and lends foldability thereto for a purpose explaned hereinafter. Each portion **31***a* and **31***b* is provided with a notch **35** in its outermost free edge, which is so positioned that the notches in adjoining portions will be in registry when the blank is folded about fold line **28** to bring the associated panels into face-to-face relationship.

A flap or tab **40** extends axially from the panel **21** and is foldably secured thereto by means of score line **41**. The flap or tab **40** is provided with opposed recesses **42** which define shoulders **43** which provide a self-locking feature. A slot **44** traverses the fold line **41** between panels **21** and the flap or tab **40**, and is in alignment with slit **30**. A similar flap or tab **46** extends axially from the other endmost panel **27** and is separated therefrom by a fold line **47**. This flap or tab likewise possesses opposed recesses **47** which define opposed shoulders **48** for a locking feature. A slot **49** traverses the fold line **47** and is in alignment with slit **30**.

The blank just described is erected into carton configuration in the manner shown in Fig. 3. The central panel **24** becomes a ply of the ultimate bottom wall **11** (Fig. 1). Side panels **25** and **26** are folded into face-to-face relationship and into a plane normal to panel **24** to thereby define side walls of the final carton. The fold line **28** between the side panels **25** and **26** becomes the upper edge of the side wall. The panel **27** is then folded reversely beneath the panel **24** and spans the distance from the side wall to the slit **29**. The flap or tab **46** can then be inserted in the slit **29** and projected upwardly into

a position normal to the panel **24**. The portion of the slot **49** within the panel **27** will register with the slit **30**, while the portion of the slot **49** in the flap or tab **46** will intersect therewith, but will project upwardly in the plane of the flap or tab **46**. In identical fashion, the panels **22** and **23** are folded into face-to-face relationship to form an opposite side wall, the panel **21** is reversely folded beneath the panel **24**, and the tab or flap **40** introduced into the slit **29** to project upwardly into face-to-face relationship with the flap or tab **46**. The flaps **31** will have their parts **31***a* and **31***b* in flush relationship, and these are folded inwardly in a plane normal to the side wall defined by the panels **25**, **26**, and **22**, **23**, respectively. There will thus be defined end walls for the carton which are composed of two plies (**31***a*, **31***b*) which have hand holds therethrough by reason of the edge-to-edge meeting of the panels having notches **35** in the free edges.

The construction of the carton of this invention at this stage is shown in Fig. 4, wherein it can be seen that the side walls, end walls, bottom wall, and partitions are formed of two plies of the material of construction. As may further be seen, the end walls formed by the inturned flaps **31** will have a tendency to unfold. If desired, masking tape or the like may be used to hold them together in edge-to-edge relationship. This is not absolutely necessary, however, inasmuch as the second component of the receptacle serves this purpose in a manner to be explained, in addition to providing additional plies for these end walls and also an additional ply for the bottom wall.

The second component for the carton construction of this invention is shown in knock-down blank form in Fig. 5, and is identified by the numeral **50**. It is generally quite similar to the blank shown in Fig. 3, being composed of a foldably connected linear series of relatively foldable panels **51**, **52**, **53**, **54**, **55**, **56**, and **57**, separated by score lines **58**. Between panels **52** and **53**, and likewise between panels **55** and **56**, there is provided a small bridging portion **59** and **60**, respectively, which permits the adjacent panels to be assembled into spaced parallel relationship so that it may embrace the end walls defined by the flaps **31** of the first component. Each of the panels **52**, **53**, **55**, and **56** are provided with a cut-out **61**. These are located on either side of the respective bridging portions **59** and **60** in such fashion that they will be in registration when arranged in spaced parallel relationship. The centermost panel **54** is provided with a pair of intersecting slits **62** and **63** which are normally disposed. Flap or tab **64** extends axially from the panel **51** and is foldably secured thereto by a score line **65**. The flap **64** is smaller than the panel **51** and is provided with cut-outs **66** which define shoulders **67** to provide a self-locking feature. The flap **64** is further provided with a notch **68** in its outermost free edge in alignment with the slit **63**. A similar flap or tab **70** extends axially from the opposite panel **57** and is foldably secured thereto by a score line **71**. It is provided with cut-outs **72** which define shoulders **73**. The outermost edge of the flap **70** is provided with a slit **74** in alignment with slit **63**.

The blank just described is combined with the element shown in Fig. 4 in a manner illustrated in Fig. 6. Thus, the panels **53** and **55** are folded upwardly about fold lines **58** into perpendicular relationship with the panel **54**. In this fashion, the panel **54** may be inserted down within the confines of the upstanding walls of the first component, and with the slit **63** fitting down over the partition defined by the flaps **40** and **46**. Next, the panels **52** and **56** are folded downwardly about the respective end walls (flaps **31**) so that the latter will be embraced by the spaced upper edge-connected panels **55** and **56** and panels **52** and **53**. Next, the panels **51** and **57** are folded reversely into abutting relationship with the lowermost ply of the bottom wall defined by panels **21** and **27**, whereupon the flaps **64** and **70** may be inserted upwardly through the slits **62**, **44**, **49**, and **30**. The notches **68** and **74** will engage the partition plies composed of flaps **40** and **46** and thereby interfit to provide partitions which are normally disposed.

The location of the hereinbefore mentioned shoulders **67**, **73**, **43**, and **48** is adjusted by the dimension of the cut-outs **66**, **72**, **42**, and **47** which is chosen to conform to the total thickness of the plies of the bottom wall, and, further, the shoulders are provided with a lateral dimension selected to cooperate with the linear dimension of the slits so that the tabs or flaps will fit through the slits and will be frictionally contacted thereby so that the carton when finally erected will be self-locked.

In this final form, the bottom wall of the carton construction will be composed of four plies of the material of construction, as will the end walls, while the side walls will be composed of two plies. The cut-outs **61** will register with the notches **35** so that the hand hold will be complete through the entire thickness of the end wall.

From the foregoing description, it is obvious that the blanks constituting the individual components of the carton of this invention are of relatively simple design, and the folding of these blanks and the combining thereof may be accomplished in a simple and expedient fashion. The carton construction of this invention does not require any auxiliary stiffening elements of wood or metal. Further, the carton of this invention does not require any auxiliary fastening arrangements to hold it in its erected form. Additionally, it may be pointed out that the carton of this invention is readily assembled by hand. The unique functioning and cooperative relationship of the end flaps or tabs which serve as integral partitioning means, and likewise serve to lock the structure in its final form, provide the foregoing mentioned advantages. Whatever weakness in the individual panels which is induced by the intersecting slits in the panels forming the bottom wall is overcome by the fact that the preferred design utilizes four plies to constitute the bottom wall. Also, whatever weakness might be induced by the hand hold cut-outs is more than overcome by the provision of four-ply construction in these end walls. It may further be noted that the carton is so designed that, where corrugated board is used as the material of construction, the direction of the corrugations in the various plies varies, thus, further enhancing the strength characteristics of the carton construction of the invention. While, as indicated, the construction disclosed does not require any auxiliary fastening, it may be desirable under the most rigorous of conditions to employ an adhesive to bond the entire wall formers together, as well as the bottom plies.

It will be evident to those skilled in the art that certain modifications may be resorted to in connection with the carton construction described without departing from the spirit and scope of the invention, and it is not intended by the foregoing description to be limited to the precise embodiment shown, except as indicated by the scope of the appended claims.

I claim:

1. A carton construction comprising an open-topped receptacle which includes a bottom wall, walls upstanding from the perimeter of said bottom wall, an internal upstanding partition, said bottom wall and said partition each being provided with a slit, said slits intersecting in the base of said receptacle, and a reinforcing element assembled with said receptacle formed of realtively stiff, sheet-like material, said element comprising a central panel provided with a pair of intersecting slots, one receiving said partition and allowing the panel to assume flush relationship with said bottom wall and the other registering with said slit in said bottom wall of said receptacle, a pair of relatively foldable panels foldably secured in series to an edge of said central panel, said panels being assembled to lie in spaced parallelism embracing one of said upstanding walls of said receptacle, a third panel foldably secured to the second panel of said pair spanning the distance between the upstanding wall and the slit in

said bottom wall, and thereby reinforcing said bottom wall, and a flap foldably secured to said third panel projecting upwardly through in said slit within said receptacle as a second partition, and being provided with a notch in its outermost free edge engaging said first-mentioned partition.

2. A carton construction comprising an open-topped receptacle which includes a bottom wall, upstanding opposed side walls, upstanding opposed end walls formed by in-turned flaps foldably secured to said side walls, said flaps meeting edge-to-edge to complete said end wall, and being provided with notches in said meeting edges, which notches together define a hand hold in said end walls, an internal upstanding partition, said bottom wall and said partition each being provided with a slit, said slits intersecting in the plane of said bottom wall, and a reinforcing element assembled with said receptacle and being formed of relatively stiff, sheet-like material, said element comprising a central panel provided with a pair of centrally located normally disposed intersecting slots, one of said slots registering with said partition when said central panel is lowered thereover into flush contact with said bottom wall, and the other slot being adapted to register with said slit in said bottom wall, a pair of relatively foldable panels foldably secured in series to an edge of said central panel, said pair being positioned in spaced parallelism embracing one of said upstanding end walls, a third panel foldably secured to the second panel of said pair spanning the distance between the upstanding wall and the slit in said bottom wall, and thereby reinforcing said bottom wall, a flap foldably secured to said third panel projecting upwardly within said slit, and shoulders on said flap engaging said slits and preventing removal thereof, said flap being provided with a notch on its outermost free edge engaging said partition in interfitting normal relationship to thereby further divide said receptacle into a plurality of compartments.

3. A carton having a bottom wall and walls upstanding about the perimeter of said bottom formed of multiple plies of relatively stiff, sheet-like material and having a plurality of internal partitions upstanding from said bottom wall, said carton comprising in combination: a first member formed of said material and composed of a linear series of relatively foldable, generally rectangular panels in which the centermost panel defines one of the bottom plies and is provided with a pair of intersecting slits, the next two intermediate panels on both sides of said centermost panel positioned in flush relationship with each other to form a first pair of opposed side walls of said carton, the next outward panel being folded reversely beneath said centermost panel to form half of another bottom ply, and the endmost panels of said series projecting upwardly through said slits to form abutting upstanding partitions, laterally projecting flaps on both sides of said intermediate panels forming a second pair of opposed side walls, the endmost and adjacent intermediate panels having a common slot traversing the fold line therebetween registering with said other slit in assembled formation, said flaps being respectively provided with notches in their outward free edges to serve as hand holds; a second member formed of said material and being composed of a linear series of relatively foldable, generally rectangular panels in which the centermost panel defines the top ply of said bottom wall and has a pair of intersecting slits registering

with said slits in said first member when said two centermost panels are in assembled relationship, the next two intermediate panels on both sides of said centermost panel being folded into spaced, parallel relationship embracing said flaps forming a pair of opposed side walls and each having hand hold notches therein registering with said hand holds in said flaps, the next outward panels each forming half of another bottom ply of said bottom wall, and the endmost panels of said series being assembled in flush abutment projecting upwardly through the unoccupied slit, and each being provided with a slot in the outer free edge thereof to engage the first-mentioned partition to thereby yield an interlocked, internally partitioned carton with all elements thereof formed of multiple plies.

4. A carton construction characterized by having a bottom wall and upstanding side and end walls formed of relatively stiff, sheet-like material, and further characterized by compartmentation, said construction comprising: a first element formed of said material slitted and scored so as to define a central rectangular panel forming a bottom wall ply, and being provided with a pair of intersecting slits, a series of relatively foldable panels foldably secured to opposite edges of said central panel, each of said series comprising a first and second panel folded into abutment with each other in a plane normal to said central panels to form a two-ply side wall for said carton, and a panel foldably secured to said second panel forming one-half of an additional bottom wall ply, a flap foldably secured to said last-mentioned panel of said series receivable in one of said slits and projecting upwardly therethrough into a position normal to said bottom wall and in spaced parallelism with said side walls, said flaps and the adjacent panel to which attached being provided with a slot crossing the line of attachment of said flap and panel and located so that the portion of the slot in the panel registers with the remaining slit not occupied by said flap, and flaps extending from opposite ends of one of said first and second panels, folded inwardly into a plane normal to said side walls and bottom wall to together span the distance between said side walls, said flaps having notches in their outermost free edge which define a hand hold; a second element formed of said material slitted and scored as to define a central rectangular panel provided with a pair of intersecting slits, said central panel of said second element overlying said central panel of said first element to form an inner ply of said bottom wall, a series of relatively foldable panels foldably secured to opposite edges of said central panel, each of said series comprising a first and second panel assembled to embrace the flaps of said first element forming the said end walls, to thereby yield multiple ply end walls, each of said panels being provided with notches positioned so as to register with each other and with the notches in said flaps, a panel foldably secured to said second panel forming one-half of an outer ply of said bottom wall, and a flap foldably secured to said last-mentioned panel projecting upwardly through one of said slits and being provided with a notch in its outer free edge for interfitting with said partition member formed of said first element.

References Cited in the file of this patent

UNITED STATES PATENTS

2,089,067 Myers ---------- Aug. 3, 1937