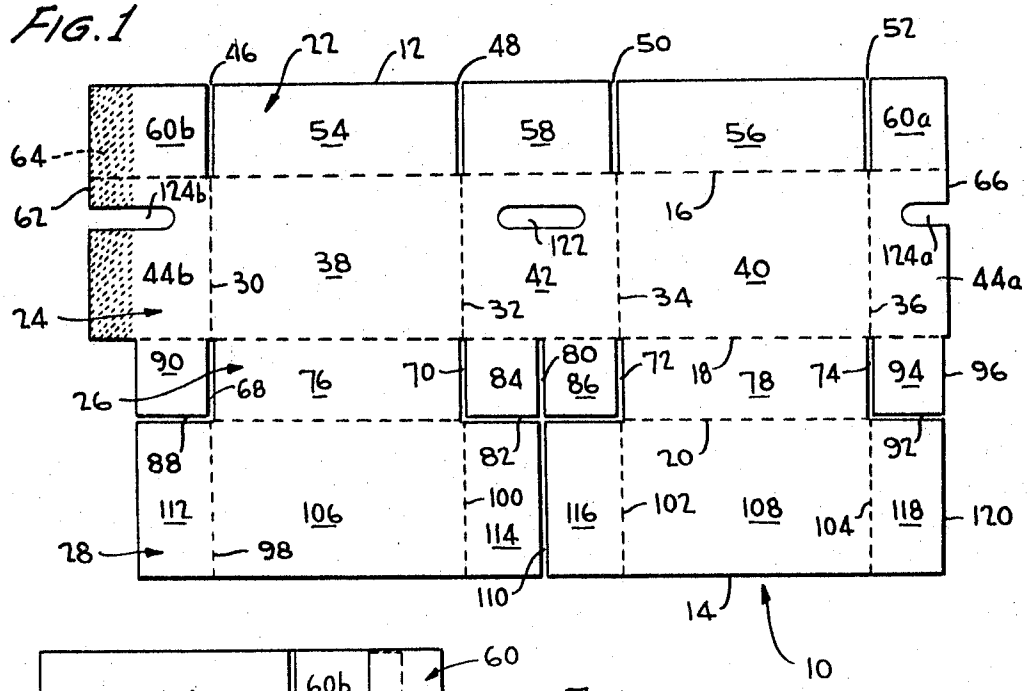
July 22, 1969 D. M. STEGNER 3,456,862

SELF-LOCKING REINFORCED DIVIDED CARTON

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FIG. 1



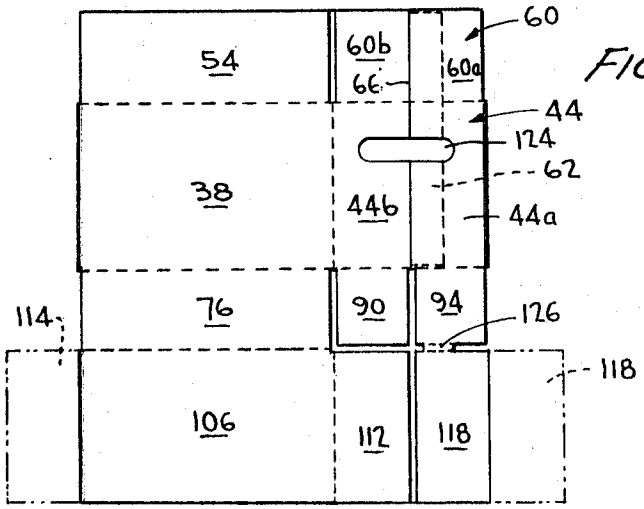
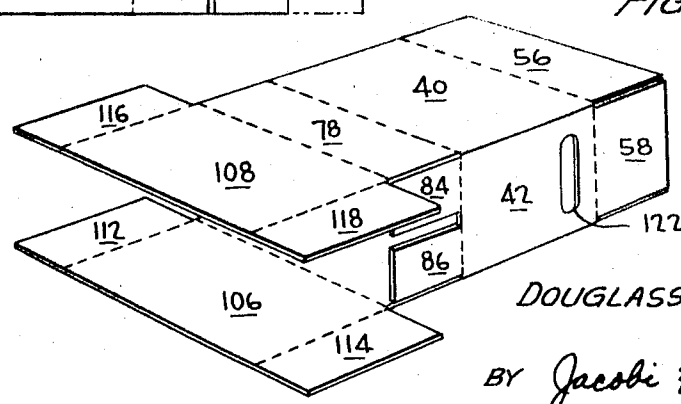


FIG. 2

FIG. 3



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FIG. 4

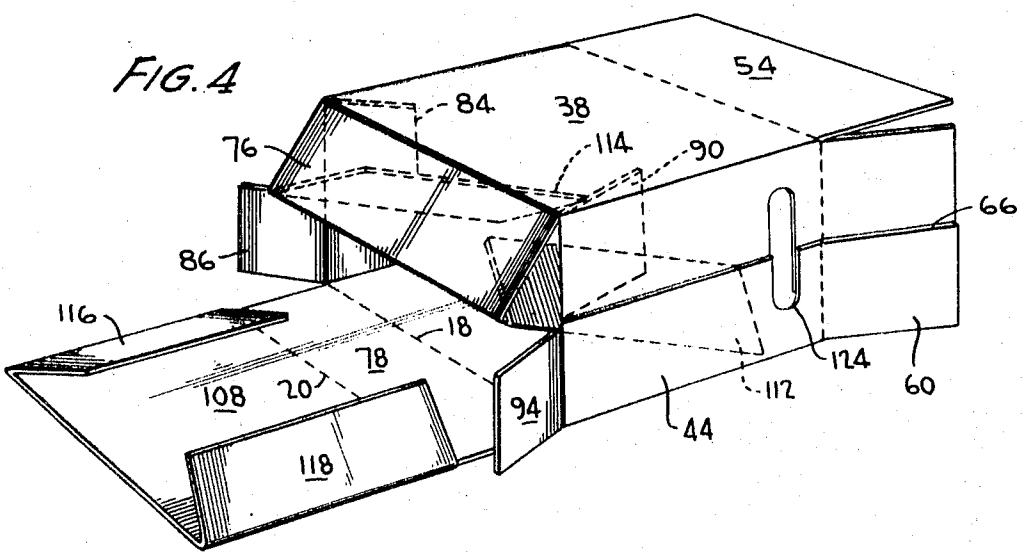
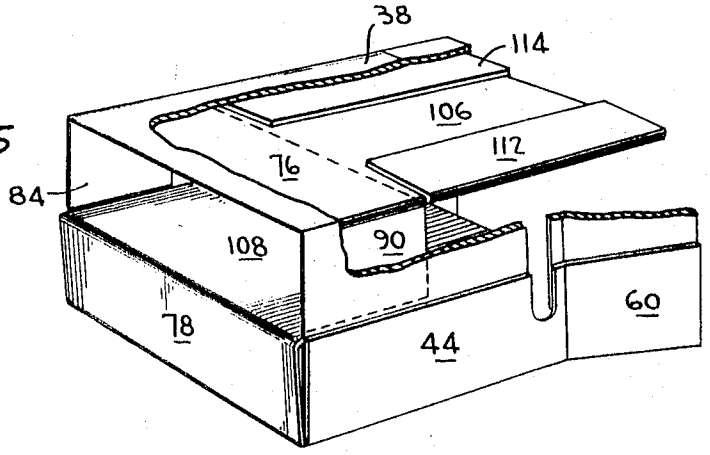


FIG. 5



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FIG. 6

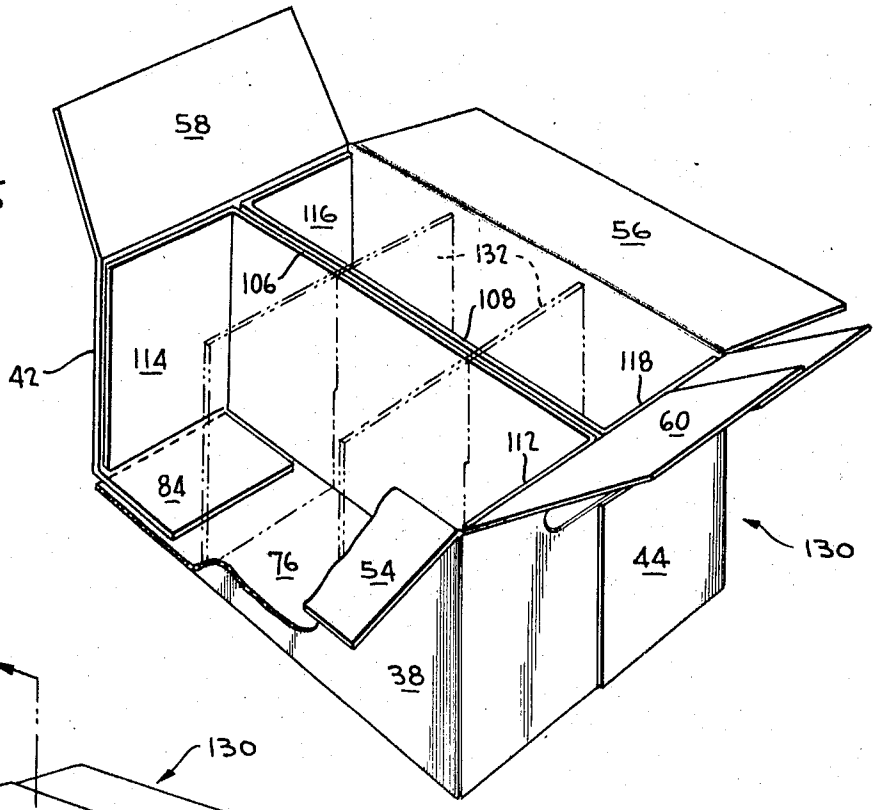


FIG. 7

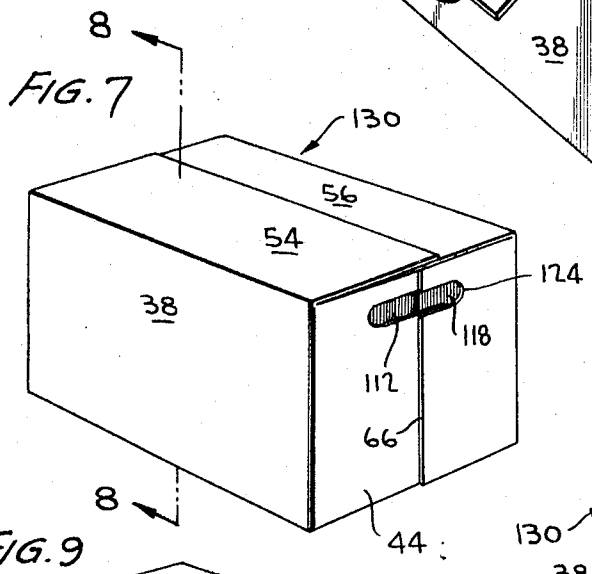


FIG. 8

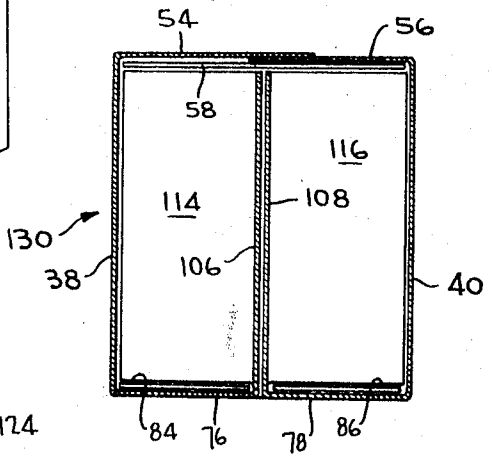
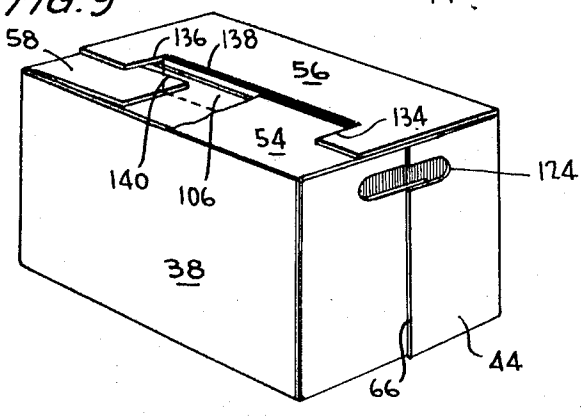


FIG. 9



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SELF-LOCKING REINFORCED DIVIDED CARTON

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FIG. 10

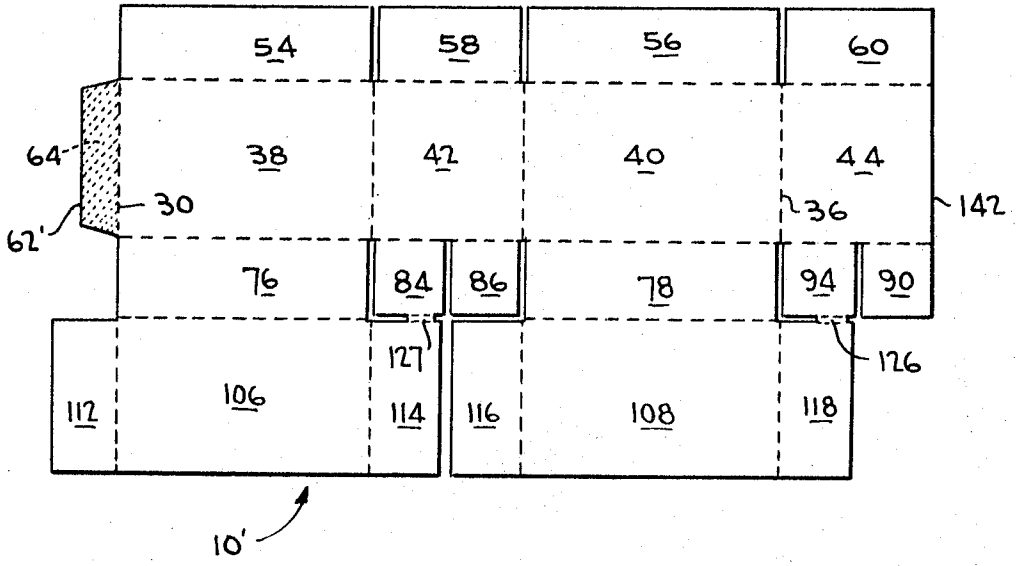


FIG. 11

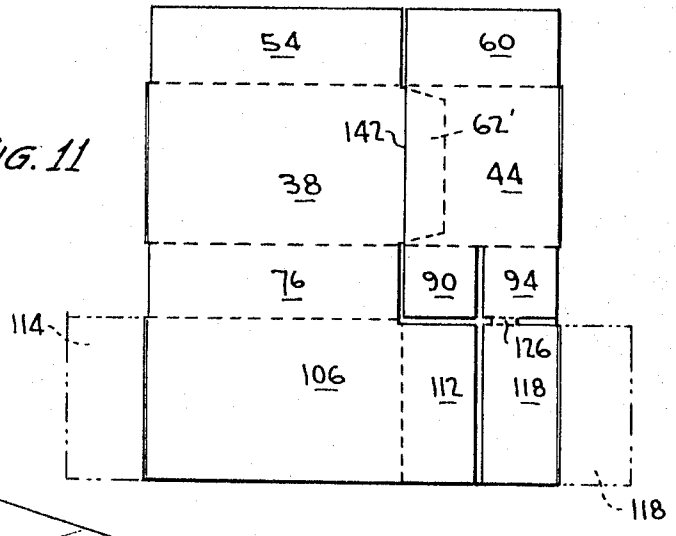
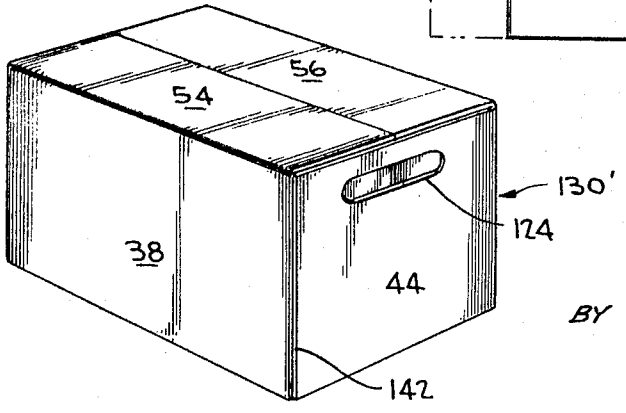


FIG. 12



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FIG. 13

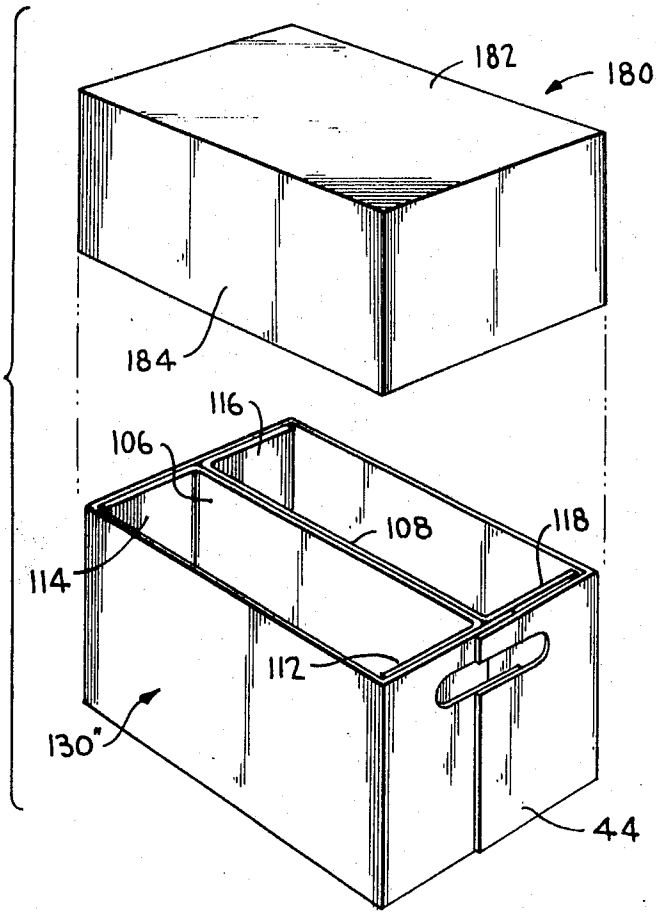


FIG. 14

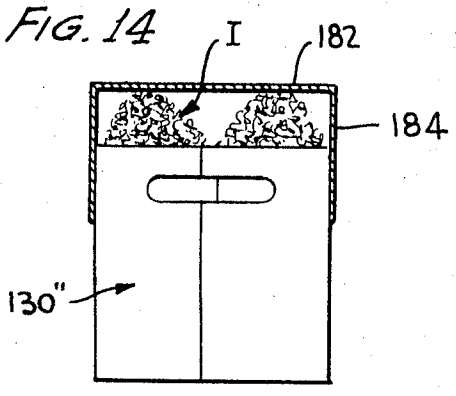
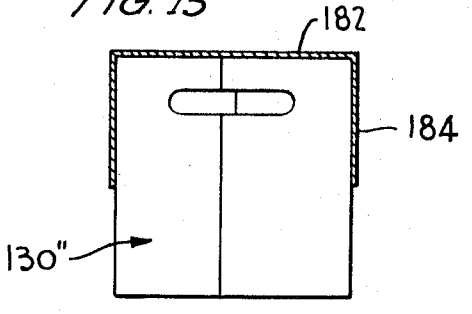


FIG. 15



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United States Patent Office

3,456,862

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3,456,862

SELF-LOCKING REINFORCED DIVIDED CARTON

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Int. Cl. B65d 5/48

U.S. Cl. 229—27 3 Claims

ABSTRACT OF THE DISCLOSURE

An improved self-locking reinforced divided carton and a unitary blank from which the carton is assembled is disclosed. The unitary blank is constructed such that the carton has a double thickness divider therewithin and has hand holes centrally located on the end walls, which hand holes do not communicate with the interior of the carton. As a result of this construction the carton is particularly strong for help in stacking and is resistant to weakening by moisture leaking through it. Further, contamination of the contents is eliminated since there are no openings communicating with the outside.

This invention relates to the art of containers, and more particularly, it relates to a self-locking reinforced divided carton.

As utilized herein, the term "self-locking" refers to a type of carton which can be readily erected by manual operation in the field, and which does not require any special processing or gluing machines or equipment. The term "reinforced" as used herein, refers to a carton which, by its constructional features, possesses high strength characteristics, particularly, high stacking strength. The term "divided," as used herein, refers to a carton having a portion disposed interiorly thereof which serves to create separate compartments therewithin.

Divided cartons have been known and utilized in the art for some time. However, in most instances, such divided cartons utilized a divider section which was separate and distinct from the remainder of the carton. In such prior art constructions, separate inserts, commonly known as H-pads, had to be provided as separate items which were manually inserted into a carton. One of the serious drawbacks and deficiencies with this type of prior art arrangement was that the carton manufacturer had to produce two entirely different sections, namely, the carton blank section and the insert blank section. Then, each of these separate sections had to be shipped to the ultimate user who, in turn, had to separately erect the carton and the insert, and had to then assemble the two. It will thus be appreciated that prior art types of divided cartons were necessarily more expensive for a manufacturer to produce, because of the separte operations required to produce the carton blank and the insert blank, and that more manipulative steps were involved for an ultimate user to properly erect the carton and to insert the divider therewithin.

Considering another aspect of the present invention, it should be apparent that a self-locking carton which can be field erected has a great many advantages and beneficial features in comprison to conventional cartons. That is, the ordinary or conventional carton was supplied by the manufacturer to the user in the form of a carton blank. The user then had to utilize a machine for assembling the blank into a carton and for properly gluing the flaps so that the carton would maintain its erected position. Even aside from the cost of purchasing and operating such a carton erecting machine, a serious drawback with this type of conventional carton was that the erecting machines were not versatile enough to readily

accommodate different sizes and shapes of cartons. Hence, if a shipper utilized only one size and shape of carton, a box-making machine might be practical for his purposes, but if such a shipper utilized several different sizes and shapes of cartons, he could not readily utilize a single type of machine. Moreover, it will be appreciated that in many instances, it is desirable to have a carton which can be fully erected in the field, where no carton gluing machine is available. For this reason, the self-locking type of carton, which does not require any separate gluing operation to erect the same, is desirable and beneficial.

It is recognized, of course, that various types of self-locking cartons have been proposed in the prior art. However, the basic difficulty with all such previous self-locking cartons resided in their low strength characteristics. Indeed; in many instances, if a prior art self-locking carton was loaded with a heavy item, or was subjected to any rough handling, the carton would become unlocked and the item would fall out and very often encounter damage. Additionally, it must be recognized that most cartons, when packed, are at some point during shipping or storage, placed in a position where one such carton is stacked upon another. The stacking strength of such prior art self-locking cartons was extremely low and there was a tendency for the sides or ends of such cartons to bulge outwardly, thereby permitting weight to be applied directly to items or articles packaged within the cartons.

With all of the foregoing information in mind, it is, therefore, a primary object of the present invention to overcome the difficulties and deficiencies associated with piror art forms of cartons and containers, and to provide in their stead, a new and improved container.

Another primary object of the present invention is to provide a divided carton having reinforced strength characteristics and being of the self-locking type.

Another object of the present invention is to provide a divided carton wherein the divider section is integral with the remainder of the carton, so that both the carton section and the divider section can be fabricated of a single improved blank.

Another object of the present invention is to provide a self-locking carton which can be readily erected in the field without the need for any special processing equipment, and which, when erected, remains locked in such condition, even during rough shipping and handling.

Another object of the present invention is to provide a reinforced carton having improved strength characteristics so that no bulging will occur, even during stacking operations, and so that no bottom deflection will occur, even during shipping and handling.

Another object of the present invention is to provide a new and improved carton and carton blank construction which utilizes a minimum amount of material and which can be manufactured with a minimum amount of manufacturing steps and processes.

Another object of the present invention is to provide a carton construction wherein hand holes are provided for enabling the carton to be readily lifted and transported, but wherein such hand holes are separated from the interior of the carton so that the product within the carton still remains protected, even during handling.

Another object of the present invention is to provide a carton which can be erected manually with a minimum amount of manipulative effort and which can thus be assembled in the field quickly and easily, without requiring that the person erecting the carton have any special training or skills.

Other objects, advantages and salient features of the present invention will become apparent from the following detailed description, which, taken in conjunction with

the annexed drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

FIGURE 1 is a plan view of a blank in accordance with one embodiment of the present invention;

FIGURE 2 is plan view of the blank of FIGURE 1, as the same is shipped by the manufacturer to a user;

FIGURES 3 and 4 are perspective views illustrating the carton blank of FIGURE 1 being erected into a completed carton;

FIGURES 5 and 6 are perspective views, partially broken away, to show the erected carton with the top open;

FIGURE 7 is a perspective view of the erected carton with the top closed;

FIGURE 8 is a sectional view taken substantially along the line **8—8** of FIGURE 7;

FIGURE 9 is a perspective view of a carton having a modified form of top closing means;

FIGURE 10 is a plan view of a blank in accordance with another embodiment of the present invention;

FIGURE 11 is a plan view of the blank of FIGURE 10, as the same is shipped by the manufacturer to a user;

FIGURE 12 is a perspective view of the carton blank of FIGURE 10 erected into a final carton, with the top closed;

FIGURE 13 is a perspective view of the carton eliminating the top flaps and using a modified top; and,

FIGURES 14 and 15 are side elevational views showing the top of FIGURE 13 being applied to the carton.

With continued reference to the drawings, there is illustrated in FIGURE 1 a carton blank generally designated **10**. Such carton blank includes what can nominally be defined as an upper edge **12** and a lower edge **14**, such edges being of generally parallel alignment with one another. Three spaced parallel fold lines **16**, **18** and **20** extend across the blank, all such fold lines being in substantially parallel alignment with each other and with the upper and lower edges **12** and **14**. That portion of the blank **10** between the upper edge **12** and the first fold line **16** is generally designated **22** and serves to form the top flaps of the carton. That portion of the blank **10** between the first and second fold lines **16** and **18** is generally designated **24** and serves to form the side and end panels of the carton. That portion of the blank **10** between the second and third fold lines **18** and **20** is generally designated **26** and serves to form the bottom flaps and locking flaps of the carton. Finally, that portion of the blank **10** between the third fold line **20** and the lower edge **14** is generally designated **28** and serves to provide the carton divider sections.

By way of exemplification, rather than limitation, the carton of the present invention is intended to be of generally rectangular configuration. Accordingly, the side panels of the carton are somewhat greater in size than the end panels thereof. In the carton blank **10** of FIGURE 1, the panel portion **24** is divided by four transversely extending fold lines **30**, **32**, **34** and **36** which extend substantially perpendicularly between the fold lines **16** and **18**. That portion between the fold lines **30** and **32** defines one side panel **38**. A similar side panel **40** is formed between the fold lines **34** and **36**. One end panel **42** is set off between the fold lines **32** and **34** and is hence disposed between the side panels **38** and **40**. The other end panel **44** is formed into two halves, with one half **44***a* being hingedly connected to the fold line **36** and the other half **44***b* being hingedly connected to the fold line **30**.

The top flap section **22** of the blank **10** is provided with spaced cut lines **46**, **48**, **50** and **52** aligned respectively with the fold lines **30**, **32**, **34** and **36**. These cut lines serve to set off therebetween the various top flaps of the carton. That portion between the cut lines **46** and **48** forms a top flap **54** hingedly connected with side panel **38**. Similarly, that portion between the cut lines **50** and **52** forms a top flap **56** hingedly connected with the opposite side panel **40**. That portion between the cut lines **48** and **50** forms a top flap **58** hingedly connected with the end panel **42**. Finally, the top flap **60** which is hingedly connected with the end panel **44** is formed into two halves, with the half **60***a* being hingedly attached to the end panel half **44***a* and the half **60***b* being hingedly attached to the end panel half **44***b*.

A glue flap **62** is integrally atached with the end panel and top flap tabs **44***b* and **60***b* and a suitable glue coating **64** is provided thereupon. When the blank **10** is oriented in the manner shown in FIGURE 1, the glue **64** is on the opposite or underside of the glue flap **62**. For convenience of description, the side edge of the opposite end panel half **44***a* and its attached top flap half **60***a* can be designated **66**.

Considering now the bottom and locking flap portion **26** of the blank **10**, it will be seen that cut lines **68**, **70**, **72** and **74** are formed therein, aligned respectively with the fold lines **30**, **32**, **34** and **36**. That portion between the cut lines **68** and **70** forms a bottom flap **76** which is hingedly attached with the side panel **38**. In a similar manner, that portion between the cut lines **72** and **74** forms a bottom flap **78** which is hingedly attached to the opposite side panel **40**.

Referring now to the portion of the section **26** disposed between the cut lines **70** and **72**, it will be seen that an additional cut line **80** is formed therein substantially aligned with the center or medical axis of the end panel **42**. That portion of the third fold line **20** which extends between the cut lines **70** and **72** is completely severed or cut, as shown at **82**, to thereby form two independent locking flaps **84** and **86**, each of which is hingedly attached to the end panel **42**. The third fold line **20** is also cut or severed outwardly from the cut line **68**, as shown at **88**, to thereby form a locking flap **90** hingeably attached to the end panel half **44***b*. Finally, the fold line **20** is cut away outwardly from the cut line **74**, as shown at **92**, to thereby form a locking flap **94** hingedly attached to the end panel half **44***a*. The opposite side of the locking flap **94** is slightly notched out, as shown at **96**, so that when the end panel halves **44***a* and **44***b* are assembled, the locking flaps **90** and **94** will function independently of one another.

Considering the divider section **28** of the blank **10**, it will be seen that four spaced fold lines **98**, **100**, **102** and **104** are provided, such lines being respectively aligned with the fold lines **30**, **32**, **34** and **36**. That portion between the fold lines **98** and **100** forms a central panel **106**. Similarly, that portion between the fold lines **102** and **104** forms another central panel **108**. That portion between the fold lines **100** and **102** includes a transversely extending cut line **110** aligned with the cut line **80**. Hence, the central panel **106** carries at one side thereof end flap **112** hingedly attached along the fold line **98** and at the opposite side thereof end flap **114** hingedly attached along the fold line **100**. The central panel **108** carries at one side thereof end flap **116** hingedly attached along the fold line **102** and at the opposite side thereof end flap **118** hingedly attached along the fold line **104**. The outer edge of the end flap **118** thus is aligned substantially with the outer edge of the locking flap **94**.

Finally, hand holes can be provided in the end panels of the blank **10**. One such hand hole is formed in the end panel **42** and is designated **122**. The hand hole **124** for the end panel **44** includes a notched portion **124***a* in the end panel half **44***a* and a notched portion **124***b* through the glue flap **62** and into the end panel half **44***b*.

As is customary, the blank **10** is formed from a single sheet of fibrous material, as, for example, corrugated cardboard. Then, the manufacturer's joint is formed so that the blank can be shipped to the ultimate user. Referring to FIGURE 2, it will be seen that the manufacturer's joint is created medially of the end panel **44** and its attached flap **60** by disposing the glue flap **62** beneath the end panel half **44***a* and the top flap half **60***a*. Thus, it is

clear that end wall **42** is flat and continuous unlike end wall **44** which has the manufacturer's joint medially thereof. When the gluing of the glue flap is completed, the blank will essentially be folded in half, as shown in FIGURE 2. If desired, the cut lines **82** and **92** can be made discontinuous to thereby leave a small tab or unsevered portion **126** between the locking flap **94** and the end flap **118**, and to leave a similar tab between the locking flap **84** and the end flap **114**. The provision of the tabs prevents the end flaps **114** and **118** from swinging outwardly, as shown in dashed lines in FIGURE 2, while the assembled blank is being transported. However, these tabs **126** can be readily severed merely by a manual tearing operation when it is desired to erect the carton.

When the user receives the assembled carton **10** and desires to erect the same into a completed carton, he first severs the tabs **126**, if the same are provided. Then, as shown in FIGURE 3, the assembled blank is folded until the side panels **38** and **40** are in spaced substantially parallel alignment and the end panels **42** and **44** are likewise arranged, with the end panels and side panels being substantially perpendicular to one another.

Then, continuing to FIGURE 4, the locking flaps **84** and **90** are folded inwardly into the interior of the box until they substantially contact the end panels thereof. Then, the end flaps **112** and **114** are folded over upon the central panel **106** and this entire divider section is folded into the interior of the box. In fact, even the bottom flap **76** is folded upwardly until the same is flush with the side panel **38** of the box or carton, in the manner shown in FIGURE 5. Then, the same procedure is followed on the opposite half of the box. That is, the locking flaps **86** and **94** are folded into the interior of the carton, the end flaps **116** and **118** are folded over onto the central panel **106**, and the entire divider section is inserted into the interior of the carton. Thereafter, the divider section and bottom flap are folded with respect to one another. That is, as shown in FIGURE 5, the bottom flap **78** is disposed in substantially perpendicular relationship to the side panel **40** and the central panel **108** is folded into substantially parallel alignment with the side panels **38** and **40**. It will thus be seen that the central panel **108** extends medially along the center of the carton and divides the same substantially in half whereby two separated compartments are formed in the interior thereof. When the bottom flap **78** and central panel **108** have been thus folded, the locking flaps **86** and **94** are folded downwardly until the same are in abutting and overlying contact to the bottom flap **78**. Then, the end flaps **116** and **118** are folded outwardly so that the same extend substantially along the end walls **42** and **44**. In this manner, the locking flaps **86** and **94** are locked between the bottom flap **78** and the end flaps **116** and **118**.

Then, in a similar manner, the bottom flap **76** is folded to a position whereat the same is substantially coplanar with the bottom flap **78** and the central panel **106** is disposed in abutting contact with the central panel **108**. Thereafter, the locking flaps **84** and **90** are folded downwardly into contact with the bottom flap **76** and the end flaps **112** and **114** are folded outwardly to overlie these locking flaps. As a result, the locking flaps **84** and **90** are locked in position between the bottom flap **76** and the end flaps **112** and **114**.

The completed carton, as shown in FIGURE 6, with the top flaps open, is generally designated **130**. As can be seen from that figure, as well as from FIGURE 8, the two central panels **106** and **108**, extend perpendicularly upwardly in the center of the carton and serve to divide the same into separate compartments. Naturally, this central divider is of a double thickness formed of the material of the central panel **106** and that of the central panel **108**. The end flaps **114** and **116** extend in opposite directions from the central divider panels and are disposed in abutting contacting relationship with the end panel **42**. Hence, this end of the box is formed of a double thickness created by the thickness of the end panel **42** combined with the thickness of the end flaps **114** and **116**. The same is true at the opposite end panel **44** of the carton whereat the end flaps **112** and **118** extend thereacross in abutting relationship. As aforementioned, each end flap overlies a single locking flap and holds the same pressed tightly against the bottom flaps. To reiterate, the end flap **112** holds the locking flap **90** in contact with the bottom panel **76** and the end flap **114** holds the locking flap **84** in contact therewith. The end flap **118** holds the locking flap **94** in contact with the bottom panel **78** and the end flap **116** holds the locking flap **86** in contact therewith. Thus, at least in part, the bottom panels of the carton **130** are formed of a double thickness, at least at the four corners thereof. Even if great weight is applied to the bottom of the box, the bottom flaps **76** and **78** cannot possibly unlock, since they are prevented from doing so by contact between the bottom of the various end flaps and the top of the various associated locking flaps. If desired, the central panels **106** and **108** can be provided with slots extending partly downward from the top thereof, and transverse divider panels **132**, as shown in dotted lines in FIGURE 6, can be inserted thereinto. It is thus possible to divide each of the two main compartments in the divided carton into a series of smaller compartments, if need be.

The carton **130** of the present invention is particularly useful for transporting plastic bottles for containing liquids of various types. The reinforced construction of the carton assures that the same has a very high stacking strength. That is, all of the walls of the carton, except the two side walls **38** and **40**, are partly or entirely of double thickness. This is particularly true along all four vertically extending corners of the box, and therefore, each carton can withstand a great amount of compressive force without bulging or otherwise deforming. Even in the event that a sidewardly directed pressure or force was applied to one of the side panels of the carton, the double thickness central divider therewithin would prevent such a force from being transmitted entirely throughout the extent of the carton.

An additional important feature of the present invention resides in the fact that the hand holes **122** and **124** are substantially blocked from communication with the interior of the carton **130**. This can best be seen from FIGURES 7 and 9 wherein it is shown that the end flaps inside the carton serve to cover the hand holes. Thus, for field packaging of produce, such as lettuce and the like, this expedient proves valuable since it prevents the heads of lettuce or other items within the carton from being damaged when a handler grabs the carton by the hand holes.

In the embodiment shown in FIGURES 7 and 8, the two top flaps **58** and **60** are first folded inwardly, then the top flaps **56** and **54** are folded over to entirely close the carton **130**. These top flaps can be held closed by tape, staples, or even gluing, if this is desired. However, as aforementioned, it is extremely desirable to provide a carton which can be entirely erected and closed without any additional fabricating steps such as taping, gluing or stapling, and therefore, to this end, it is possible to provide the carton of the present invention with a self-locking top, as shown in FIGURE 9. In this figure, a pair of spaced cuts **134** and **136** extend inwardly from the edge of the top flap **56** to set off therebetween a tab portion **138**. Although not shown, a similar tab portion is formed on the top flap **54**. Each of these tabs is insertable between the central panels **106** and **108** forming the carton divider. In order to permit passage of these tabs into the central divider portion, the top flap **58** is provided with a slot **140** extending axially of the divider and the top flap **60** is likewise provided with a similar slot. Thus, to close a carton of this type, the user need

only fold down the two top flaps **58** and **60** until the slots therein align with the central divider. Then, with the tabs folded substantially perpendicularly to the top flaps **54** and **56**, the user lays these flaps downward to a flat position and inserts the tabs between the central panels **106** and **108**. The tabs remain locked therewithin by virtue of frictional engagement and the carton thus remains closed. However, if desired, the top can easily be opened to allow inspection of the contents therewithin and can then be quickly and easily closed.

With the embodiment of carton shown in FIGURES 1 through 9, the manufacturer's joint or end seam extends medially of the end panel **44** and the top flap **60** secured thereto. In certain instances, such as when ornamentation, advertising or other imprinting of the exterior of the box is desired, the presence of this seam or manufacturer's joint along the middle of the box is undesirable. Thus, in these instances, the embodiment of box shown in FIGURES 10–12 can be utilized. With this embodiment, the end seam or manufacturer's joint is formed along a corner of the carton, and is so formed in a manner to be now described, so that the side and end faces or panels of the box are smooth and even.

Referring now to the modified blank **10'** as shown in FIGURE 10, it will be seen that the side panels **38** and **40**, the end panel **42** therebetween, and all of the top and bottom flaps, and divider section, attached thereto, are identical with FIGURE 1. However, in FIGURE 10, the entire end panel **44** is hingeably attached to the side panel **40** along the fold line **36**. That is, instead of being formed in two separate halves as it was in FIGURE 1, the end panel **44** of FIGURE 10 is formed as a single continuous panel. The glue flap **62'** is hingeably attached to the side panel **38** along the fold line **40**, with the glue **64** being on the reverse side thereof. It will be noted that the glue flap **62'** of FIGURE 10 does not continue all the way up into the top flap as it did in FIGURE 1, and hence, there is a slight savings in material with the blank of FIGURE 10.

The tab **126** between the locking flap **94** and the end flap **118**, as previously described in connection with FIGURE 2, is shown on the blank in FIGURE 10. Likewise, a similar tab **127**, described but not shown in FIGURE 2, is illustrated in FIGURE 10 between the locking flap **84** and the end flap **114**. When the blank **10'** of FIGURE 10 is folded into assembled position, and the glue flap **62'** is adhered by the glue coating **64** to the inside of the end panel **44**, the blank assumes the position shown in FIGURE 11. The tabs **126** and **127** prevent the end flaps **114** and **118** from swinging outwardly to their dotted line position during handling or transit.

For convenience of description, the outer edge of the end panel **44** is designated **142**. As can be seen from FIGURE 11, and perhaps better from FIGURE 12 wherein the assembled carton **130'** is shown, this edge **142** which forms the edge of the end seam or manufacturer's joint extends along a vertical corner of the carton **130'**. Hence, the entire end panel **44'** is flat and continuous, and the same can readily be imprinted or decorated. Although the hand holes are not illustrated on the blank **10'** shown in FIGURES 10 and 11, it will be understood that such hand holes can be provided, as shown in FIGURE 12.

To reiterate some of the important aspects of the present invention, it will be readily understood from the foregoing detailed description that the blank **10** or the alternate blank **10'** are each fabricated of a single continuous sheet of corrugated cardboard or other similar material. The manufacturer himself need only provide one assembling operation, namely, the fastening of a single glue flap **62** or **62'** to form a single manufacturer's joint. The blank can then be shipped to the ultimate user. When such a user desires to erect the assembled blank into a carton, such as the carton **130** or **130'**, he need not utilize any tools whatsoever, nor does he need any machinery or fastening media such as glue, tape, staples or the like. Instead, the user need merely square the end and side panels of the box, fold the locking flaps into the box, fold the entire divider section and bottom flap into the box, then square or properly position the bottom flap in a position perpendicular to the side and end panels. When the bottom flap is properly positioned in this manner, the central panel will extend centrally upward in the interior of the box to create a central divider. The person assembling the box then folds the locking flaps between this central panel and the side panel downwardly until the same abut against the inside of the bottom flap. Then, merely by swinging the end flaps on the central panel outwardly, until the same overlie the locking flaps, the proper locking of this divider section is completed. The same sequence is followed with the opposite divider section, and as a result, assembly or erection of the box is completed.

It will be appreciated that the box as produced is fully and tightly locked in its erected position. Regardless of the weight acting on the bottom flaps of the box, no unlocking of the box can occur due to the interaction of the locking flaps with the lower edge of their overlying end flaps. It will also be appreciated that the carton thus produced is highly reinforced and is of great strength. The two end panels of the carton are of double thickness due to the thickness of the end panel itself and that of the two adjacent end flaps extending along the interior thereof. The top of the carton is of double thickness due to the presence of four interfolded top flaps. The bottom of the box is of at least partial double thickness because of the locking flaps extending over the bottom flaps. Finally, the central divider in the middle of the box is of double thickness due to the two central panels which are disposed in abutting relationship with one another. Hence, the only portion of the box which is not of double thickness is the two side panels **38** and **40**. This highly reinforced construction of the carton of the present invention, as will be appreciated, is accomplished without the provision of any separate liner or reinforcing member which must be separately inserted thereinto after assembly. Instead, it is the very construction of the carton itself which provides for its highly reinforced strength characteristics. When hand holes are provided in the end panels of the carton, the presence of the end flaps extending across the interior of the end panels serves to assure that such hand holes are blocked from direct communication with the interior of the carton or the items packaged therewithin.

Naturally, it will be understood that various changes and modifications can be made in the invention shown and described hereinabove without departing from the spirit and scope thereof. For example, the carton need not be limited to rectangular configuration with the side panels being larger than the end panels. Also, it will be seen that in the illustrated and described embodiments set forth hereinabove, each of the bottom flaps was equal to substantially one half the thickness of an end panel, so that the interior divider section was disposed in the center of the carton and served to divide the same into a pair of equally sized compartments. However, if desired, one of the bottom flaps could be of greater width than the other. Thus, for example, one of the bottom flaps could be equal to two thirds of the width of an end panel and the other bottom flap could be equal to one third the width thereof. When a blank having such characteristics was assembled into a carton, the central divider in the interior of the carton would be offset from the middle thereof and would serve to define two separate compartments, one having a volume equal to approximately two thirds of the carton and the other having a volume equal to approximately one third thereof. Other similar changes within the spirit and scope of the present invention will be apparent to those having ordinary skill in the art to which the present invention pertains.

Finally, if attention is directed to FIGURE 13, there is illustrated therein a further modified carton **130''**. This

carton is similar to both the carton **130** and the carton **130'** except that the top flap section **22** is eliminated from the blank. In other words, the top flaps **54, 56, 58** and **60** are eliminated so that the carton **130''** is more or less an open-topped tray. A cap type cover generally designated **180** is used as a top closure for the carton **130''**. This cover includes a flat top panel **182** having a peripheral skirt **184** depending therefrom. When the cover **180** is telescoped onto the carton **130''**, the skirt extends along the exterior thereof.

This type of construction is particularly useful in packaging loose or bulky materials which must be shaken down after being introduced into the carton. For example, if nails, screws, chains or other like items are to be packaged, the carton **130''** is initially overfilled so the items, designated I in FIGURE 14, extend above the top thereof. Then, the cover **180** is applied to the carton so that the underside of the top panel **182** rests on the items. The skirt **184** has sufficient length to assure that it will at least partially telescope over the sides of the carton. Then, when the carton is suitably shaken, by a conventional shake-down packing device, the items I will settle within the carton thereby permitting the cover to lower to the position shown in FIGURE 15 wherein the underside of the top panel **182** abuts against the top of the carton sides.

It will be appreciated that when a cap type cover **180** is utilized for packaging items to be overfilled, the skirt **184** is made longer than necessary. For example, if the skirt was to ordinarily be 3 inches in length, it would be increased to 6 inches when used for packaging overfilled items. Thus, when the cover is initially applied to the carton as shown in FIGURE 14, the lower 3 inches of the skirt **184** telescopes over the carton while the upper 3 inches thereof extend above the carton. Then, after shaking down has been completed, the upper 3 inches likewise telescope over the carton.

Moreover, while the embodiment shown in FIGURES 13–15 is primarily adapted for packaging loose items such as nails or the like which tend to intertwine with each other and thus not settle initially within the carton, such embodiment is necessarily limited to use with such items. As another example of its utility, such embodiment can be used in the packaging of ice packed poultry. Such poultry is placed within the compartments within the carton **130''** and ice is then poured over the poultry. The cover **180** is then applied and as the ice settles within the carton, the cover **180** lowers until it is fully telescoped onto the carton in the manner shown in FIGURE 15.

After reading the foregoing detailed description, it should be apparent that the objects set forth at the outset of the specification have been successfully achieved by the present invention. Accordingly, what is claimed is:

1. An improved self-locking reinforced divided carton comprising:

a pair of spaced parallel side panels;

a pair of spaced parallel end panels;

said end panels being joined with and extending between said side panels;

a pair of bottom flaps connected with said side panels and extending inward therefrom with the inner edges of said bottom flaps being disposed in confronting relationship;

a pair of carton divider sections, connected respectively with each of said bottom flaps at said inner edges thereof;

each carton divider section including a central panel and a pair of end flaps, connected respectively with opposite end edges of the central panel;

said central panels extending upwardly from said bottom flap confronting inner edges to thereby divide the interior of said carton;

said central panels being juxtaposed in contiguous substantially abutting relationship with each other, thereby forming a double thickness divider within said carton;

said end panels each including locking flap means extending inwardly in overlying relationship to said bottom flaps and projecting on opposite sides of said central panels;

one of said end panels being formed of two end panel portions;

the other of said end panels being flat and continuous;

said carton divider section end flaps being folded substantially perpendicularly to said central panels to overlie said locking flap means and thereby retain said carton locked in erected position;

said end flaps also extending along the interior of said end panels to thereby provide said carton with reinforced double thickness ends, each formed by an end panel and an end flap from each of said divider sections;

each of said locking flap means including a pair of closely spaced locking flaps having a slot therebetween, with the width of said slot being substantially equal to said double thickness divider within said carton;

said carton having given width equal to the distance between said side panels thereof;

each of said bottom flaps having a width substantially equal to one-half of said given width;

each of said two end panel portions having a width substantially equal to one-half of said given width;

one of said two end panel portions having glue flap means extending therefrom and juxtaposed with a portion of the other of said two end panel portions medially of the end panel;

said side panels and said end panels having a common given height, and said central panels and said locking flap means also having said given height; and

said end panels having hand hole means for enabling facile lifting and carrying of said carton, said hand hole means being centrally disposed with respect to said side walls and being blocked from communication with the interior of said carton by said end flaps.

2. A self-locking reinforced divided carton as defined in claim **1** further including a pair of top flaps integrally attached to said side panels and extending inwardly therefrom, said top flaps each including a tab portion insertable between said juxtaposed central panels to thereby maintain said top flaps closed.

3. An improved unitary carton blank for a self-locking divided carton, said blank comprising:

a continuous flat sheet of fibrous material;

said sheet having spaced parallel upper and lower edges;

said sheet having spaced parallel first and second fold lines means extending thereacross in parallel relationship to said upper and lower edges, with said first fold line being disposed closest to said upper fold lines;

said sheet portion between said upper edge and said first fold line forming the carton top flaps;

said sheet portion between said first and second fold lines defining said carton side and end panels;

said sheet portion between said first and second fold lines having three spaced transverse fold lines extending perpendicularly between said first and second fold lines to set off two side panels and two end panels;

said sheet portion between said upper edge and said first fold line having a series of cut lines, each cut line being aligned with a transverse fold line, with the cut lines serving to set off top flap means;

said sheet portion further including a third fold line, parallel to said first and second fold lines, and disposed between said second fold line and said lower edge;

said sheet portion between said second and third fold lines forming the carton bottom flaps and locking flaps;

said sheet portion between said third fold line and said lower edge forming said carton divider section;

said sheet portion between said second and third fold lines including a series of cut lines extending between said second and third fold lines, one such cut line being formed in alignment with each side edge of each of said end panels, and one such cut line being aligned with the center of each of said end panels;

said third fold line including a slit portion coextensive with the width of each end panel whereby each end panel of said carton will carry a pair of independent locking flaps;

said sheet portion between said third fold line and said lower edge being transversely cut at locations aligned with the center of each of said end panels and having fold lines aligned with the fold lines defining the side edges of said side panels whereby said carton divider section includes a pair of central panels, each having integrally attached foldable end flaps along the sides thereof;

a glue flap means being integrally connected with a side edge of said sheet between said first and second fold lines; and

said blank being erectable into a carton having opposed parallel side panels connected by opposed parallel end panels with said carton divider section being disposed interiorly of said carton and said end flaps overlying said locking flaps to maintain said carton locked in erected condition.

References Cited

UNITED STATES PATENTS

2,034,679	3/1936	Kundts	229—27 X
2,596,331	5/1952	Ferguson	229—27
2,965,277	12/1960	Prieto	229—27
3,145,902	8/1964	Nolen	229—27
3,228,581	1/1966	Stegner	229—27
3,258,152	6/1966	Cameron	229—27 X

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