Dec. 18, 1962 C. H. KEITH 3,069,062

REINFORCED CONTAINER AND BLANKS THEREFOR

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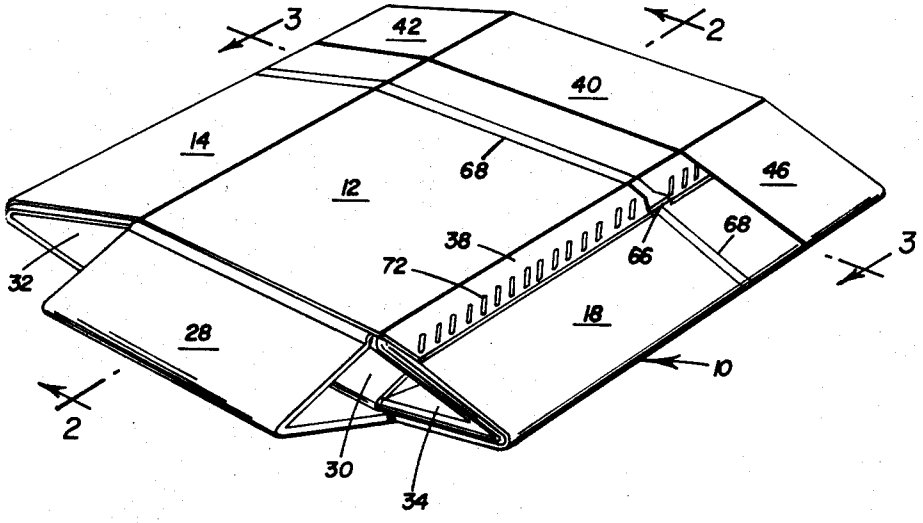


FIG. 1

FIG. 2

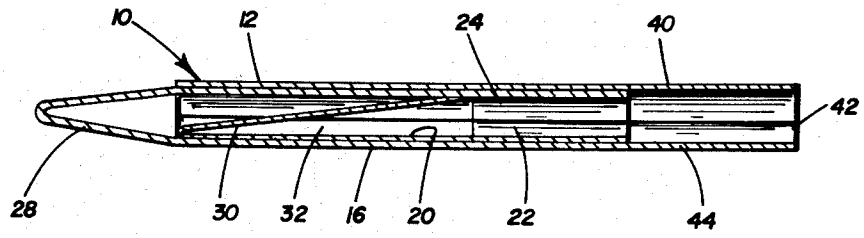
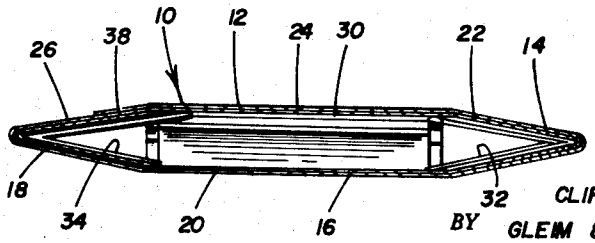


FIG. 3



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Dec. 18, 1962 C. H. KEITH 3,069,062

REINFORCED CONTAINER AND BLANKS THEREFOR

Filed Sept. 30, 1959 18 Sheets-Sheet 2

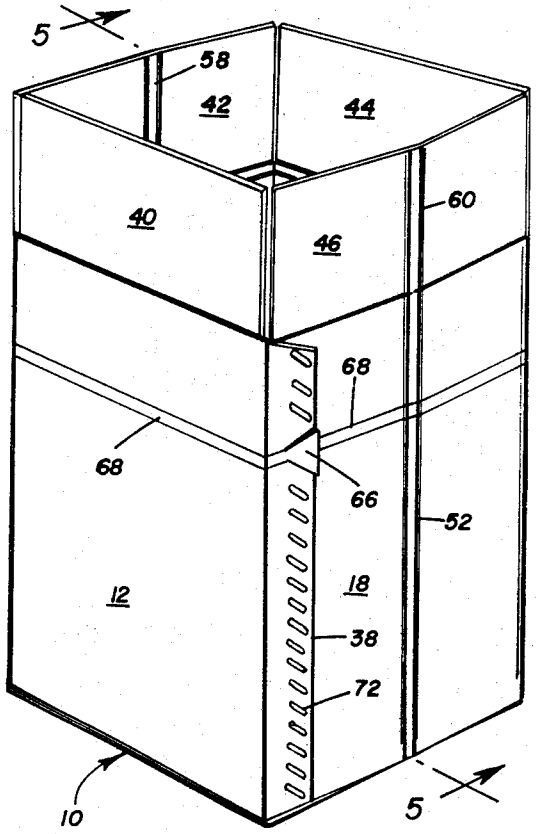


FIG. 4

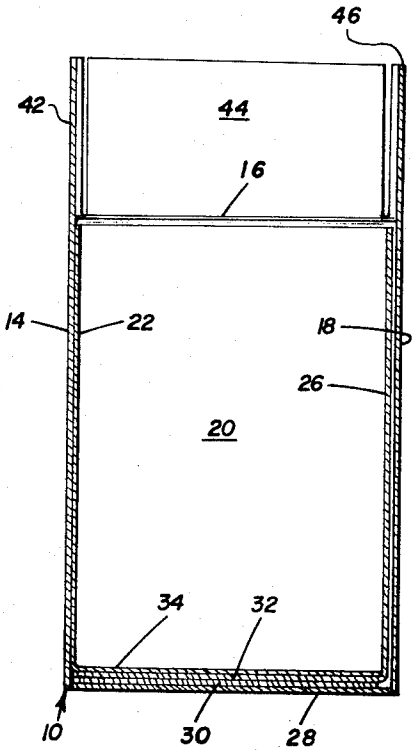


FIG. 5

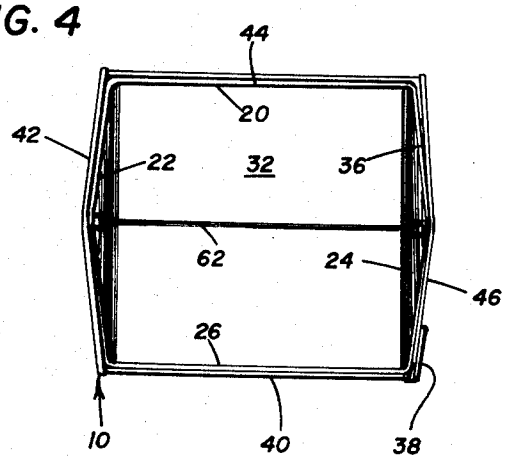


FIG. 6

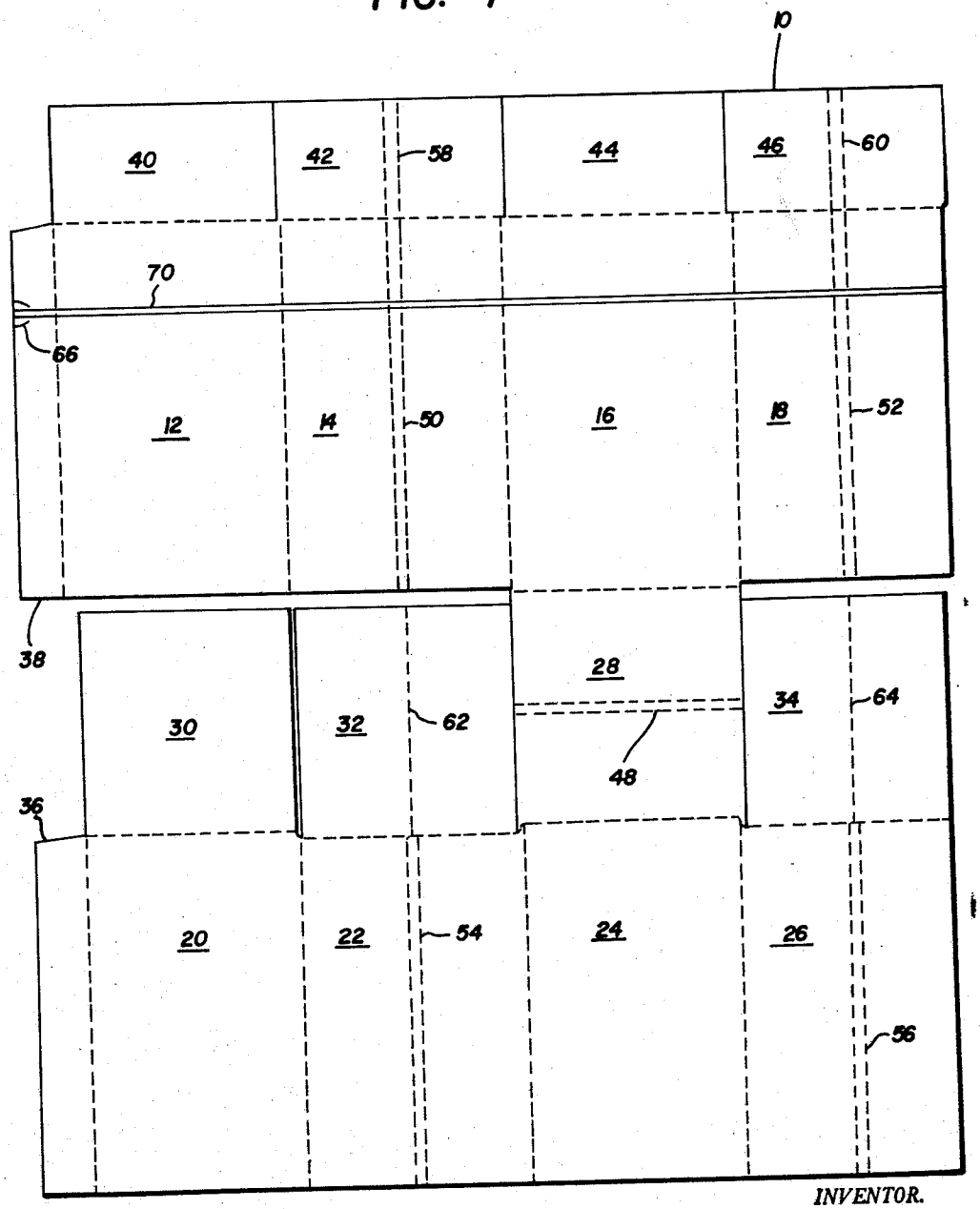
INVENTOR.
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Dec. 18, 1962 C. H. KEITH 3,069,062

REINFORCED CONTAINER AND BLANKS THEREFOR

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FIG. 7



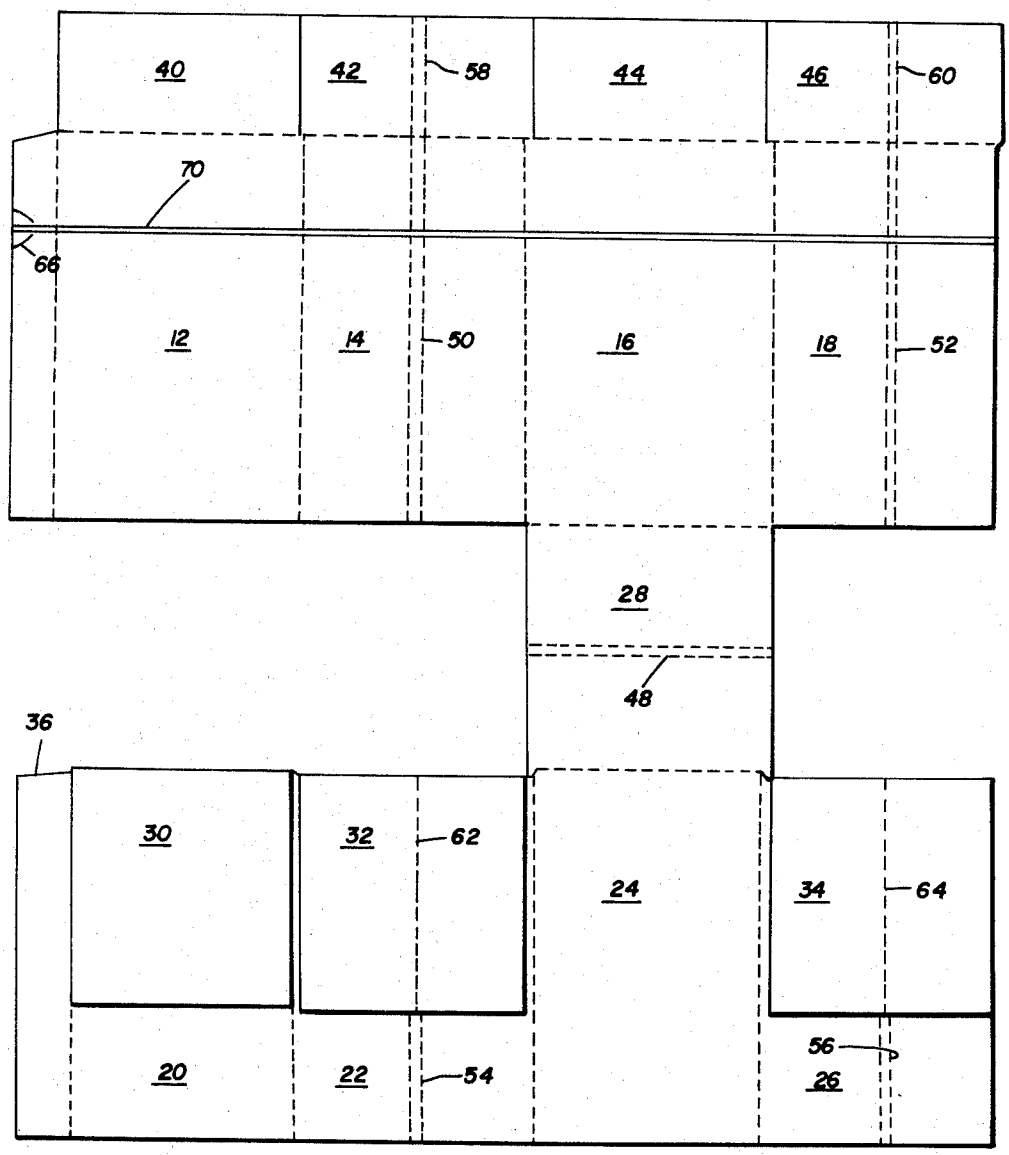
INVENTOR.
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Irwin V. Gleim
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Dec. 18, 1962 C. H. KEITH 3,069,062

REINFORCED CONTAINER AND BLANKS THEREFOR

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FIG. 8



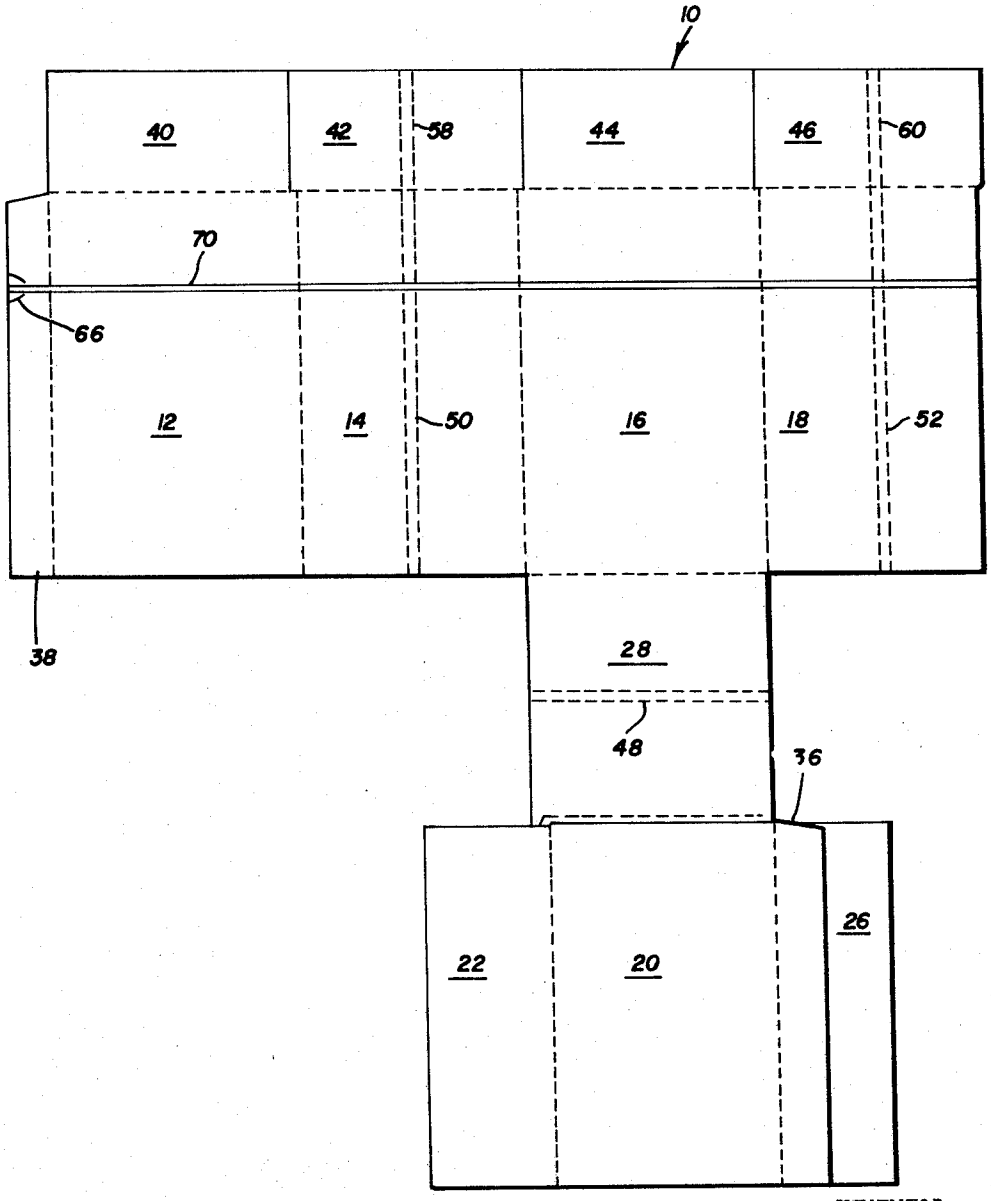
INVENTOR.
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Dec. 18, 1962 C. H. KEITH 3,069,062

REINFORCED CONTAINER AND BLANKS THEREFOR

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FIG. 9



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Dec. 18, 1962 C. H. KEITH 3,069,062

REINFORCED CONTAINER AND BLANKS THEREFOR

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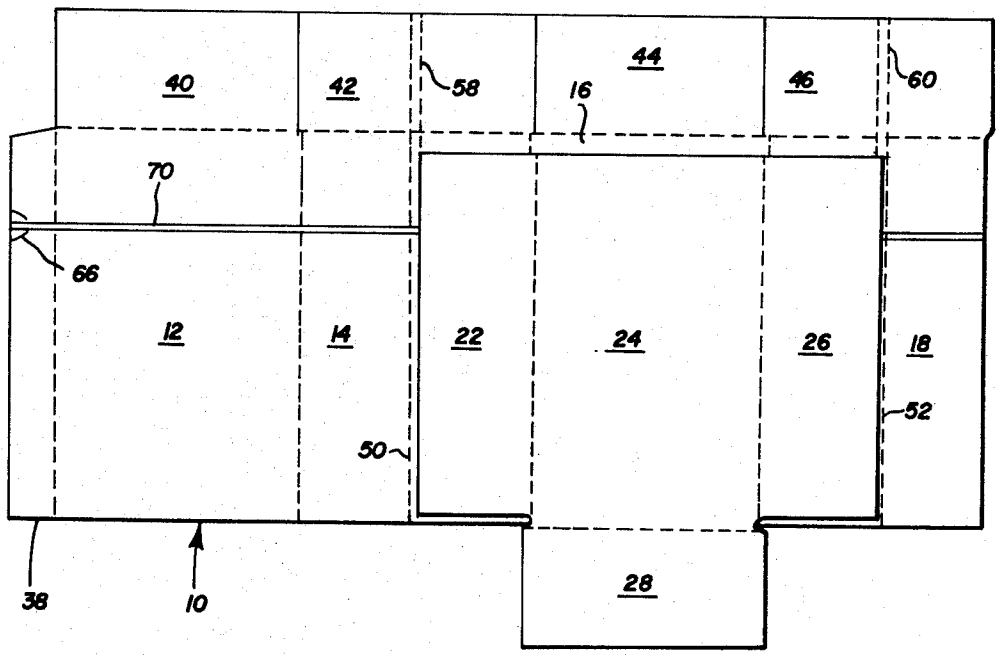


FIG. 10

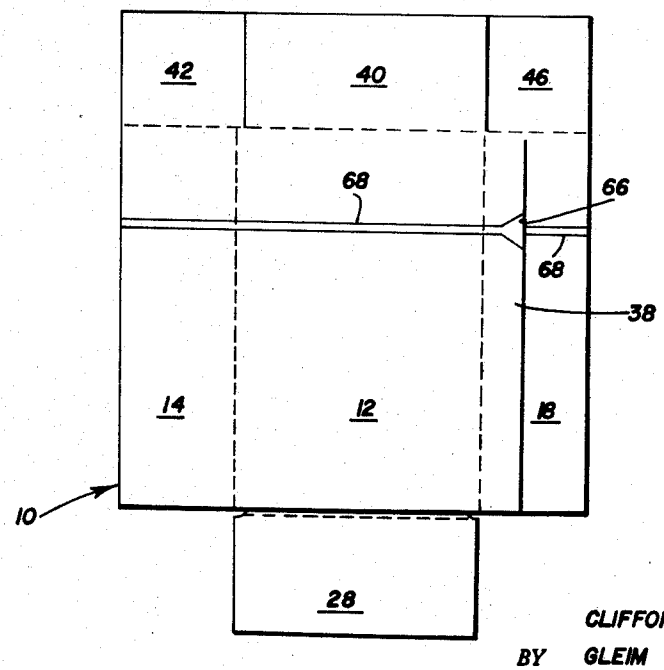


FIG. 11

INVENTOR.
CLIFFORD H. KEITH
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Dec. 18, 1962 C. H. KEITH 3,069,062

REINFORCED CONTAINER AND BLANKS THEREFOR

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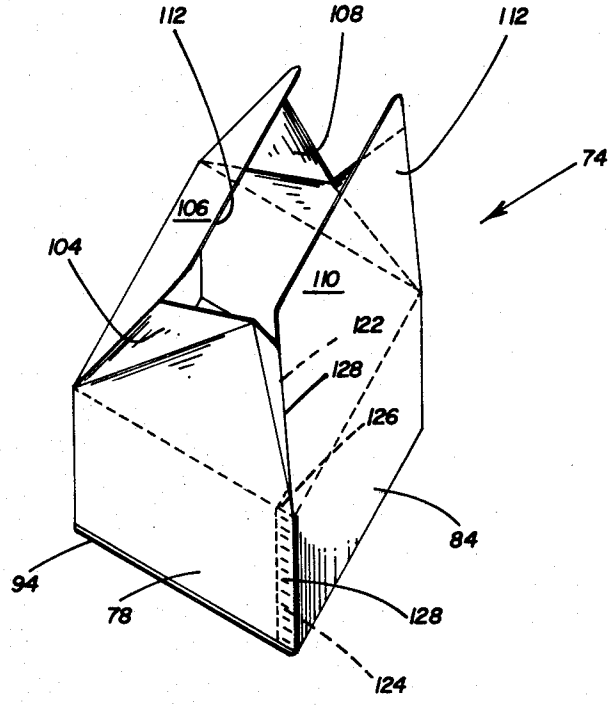


FIG. 18

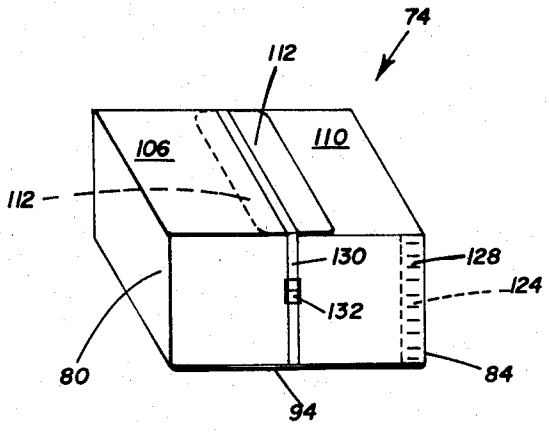


FIG. 12

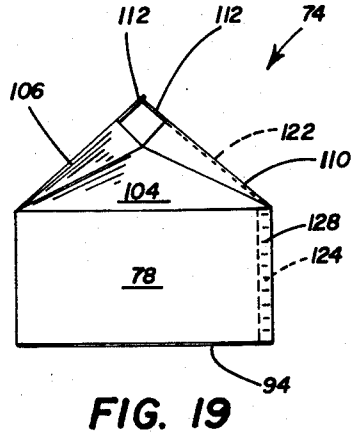


FIG. 19

INVENTOR.
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BY GLEIM & CANDOR
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ATTORNEYS

Dec. 18, 1962 C. H. KEITH 3,069,062

REINFORCED CONTAINER AND BLANKS THEREFOR

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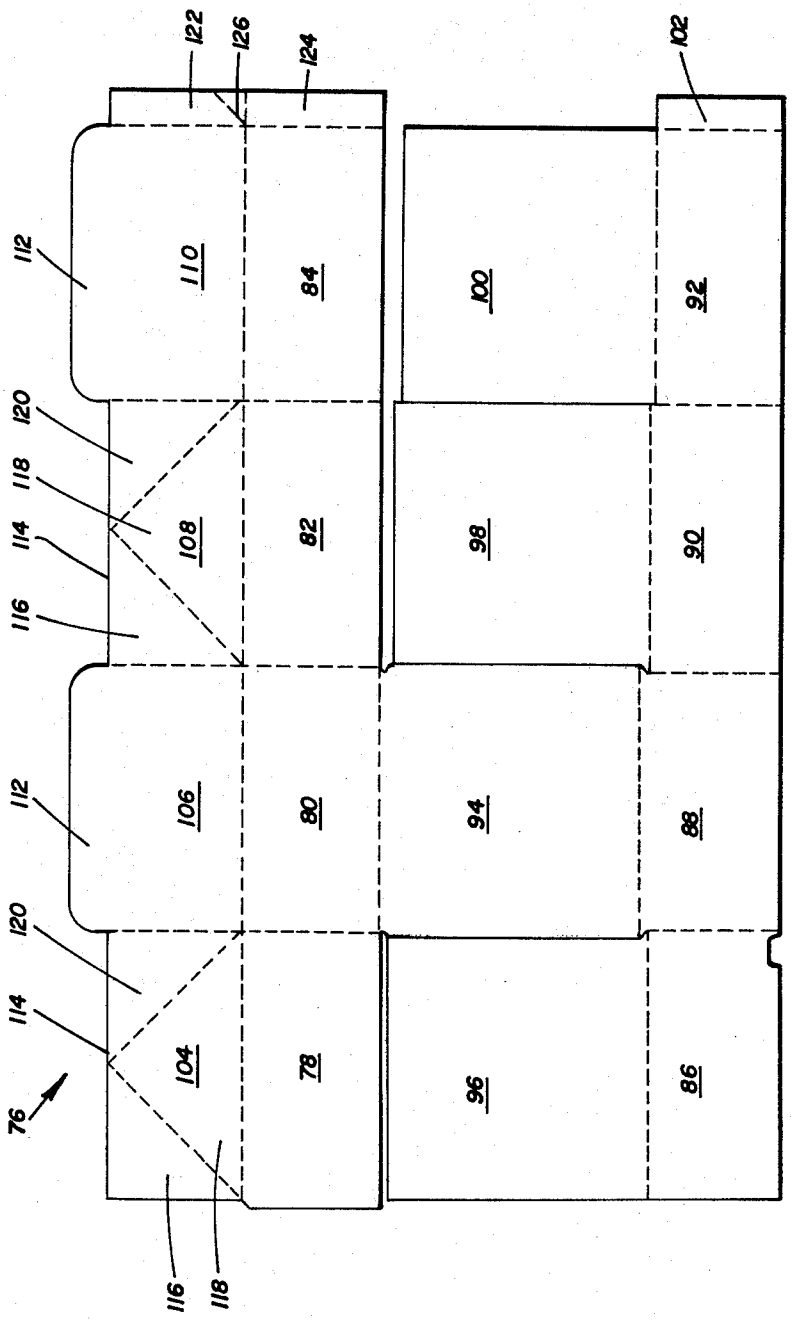


FIG. 13

INVENTOR.
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Dec. 18, 1962 C. H. KEITH 3,069,062

REINFORCED CONTAINER AND BLANKS THEREFOR

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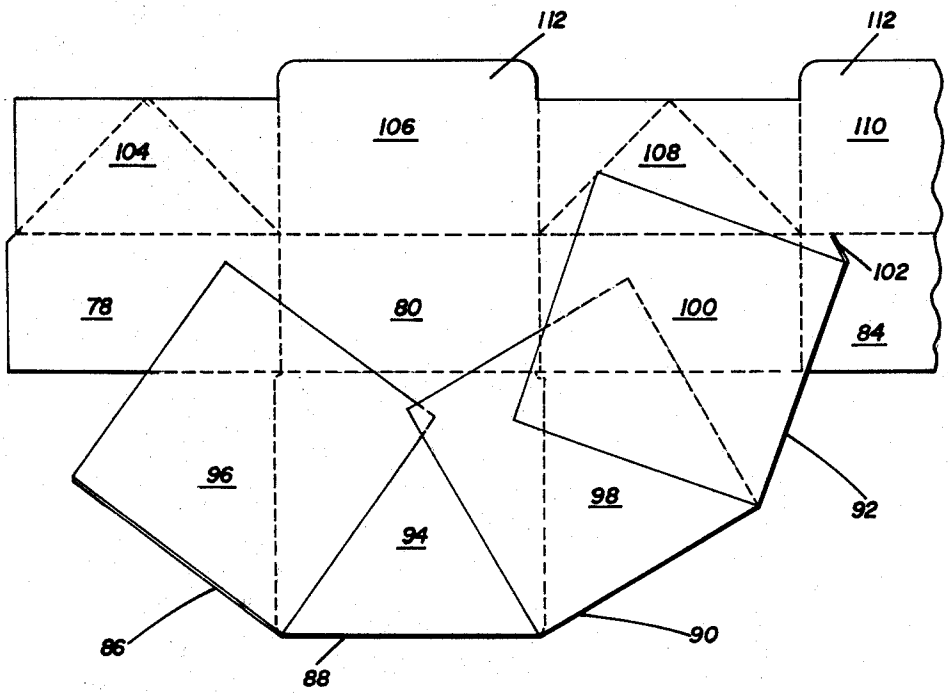


FIG. 14

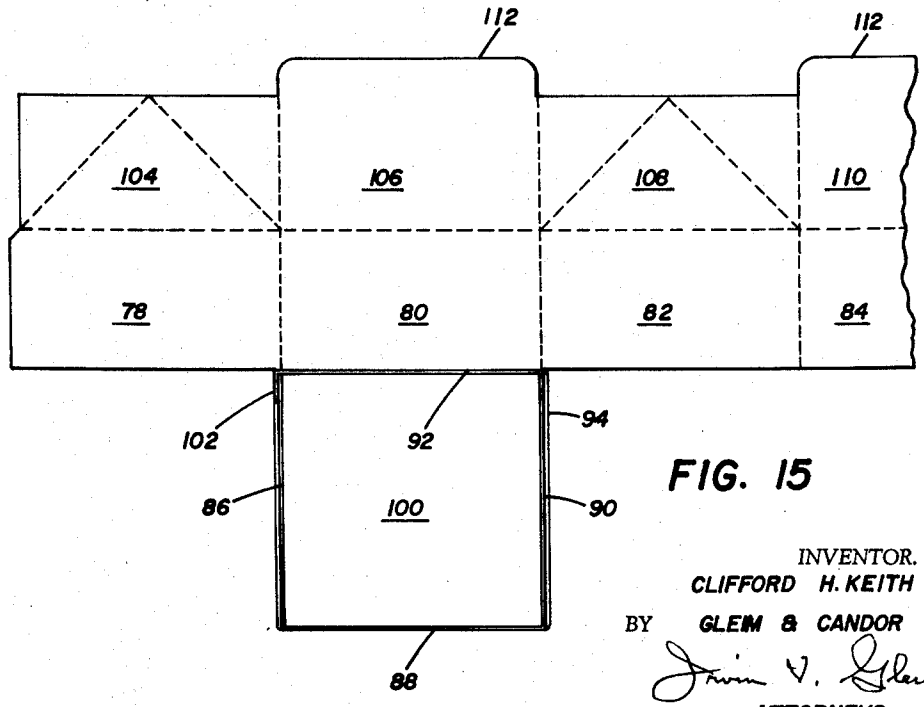


FIG. 15

INVENTOR.
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Dec. 18, 1962 C. H. KEITH 3,069,062

REINFORCED CONTAINER AND BLANKS THEREFOR

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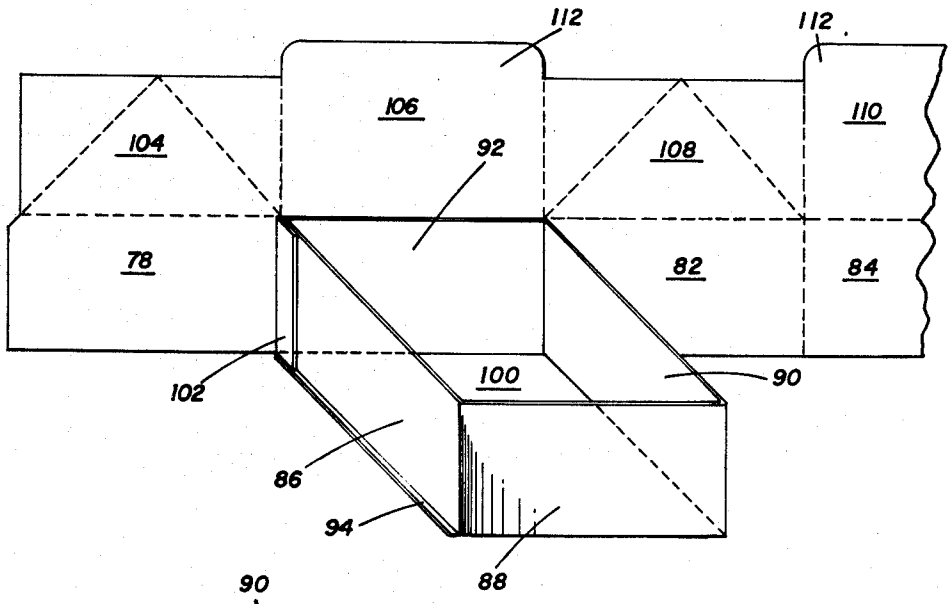


FIG. 16

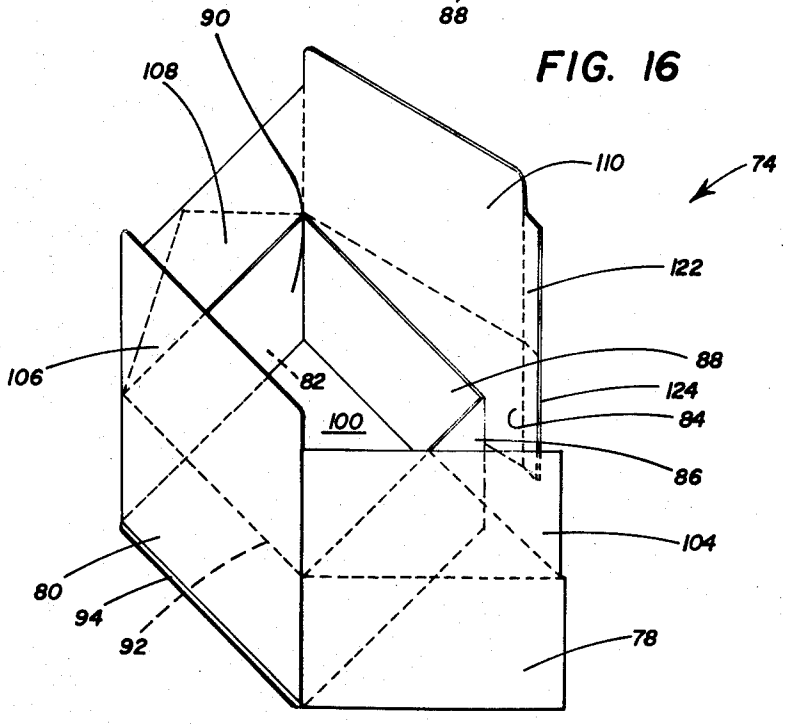


FIG. 17

INVENTOR.
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Dec. 18, 1962 C. H. KEITH 3,069,062

REINFORCED CONTAINER AND BLANKS THEREFOR

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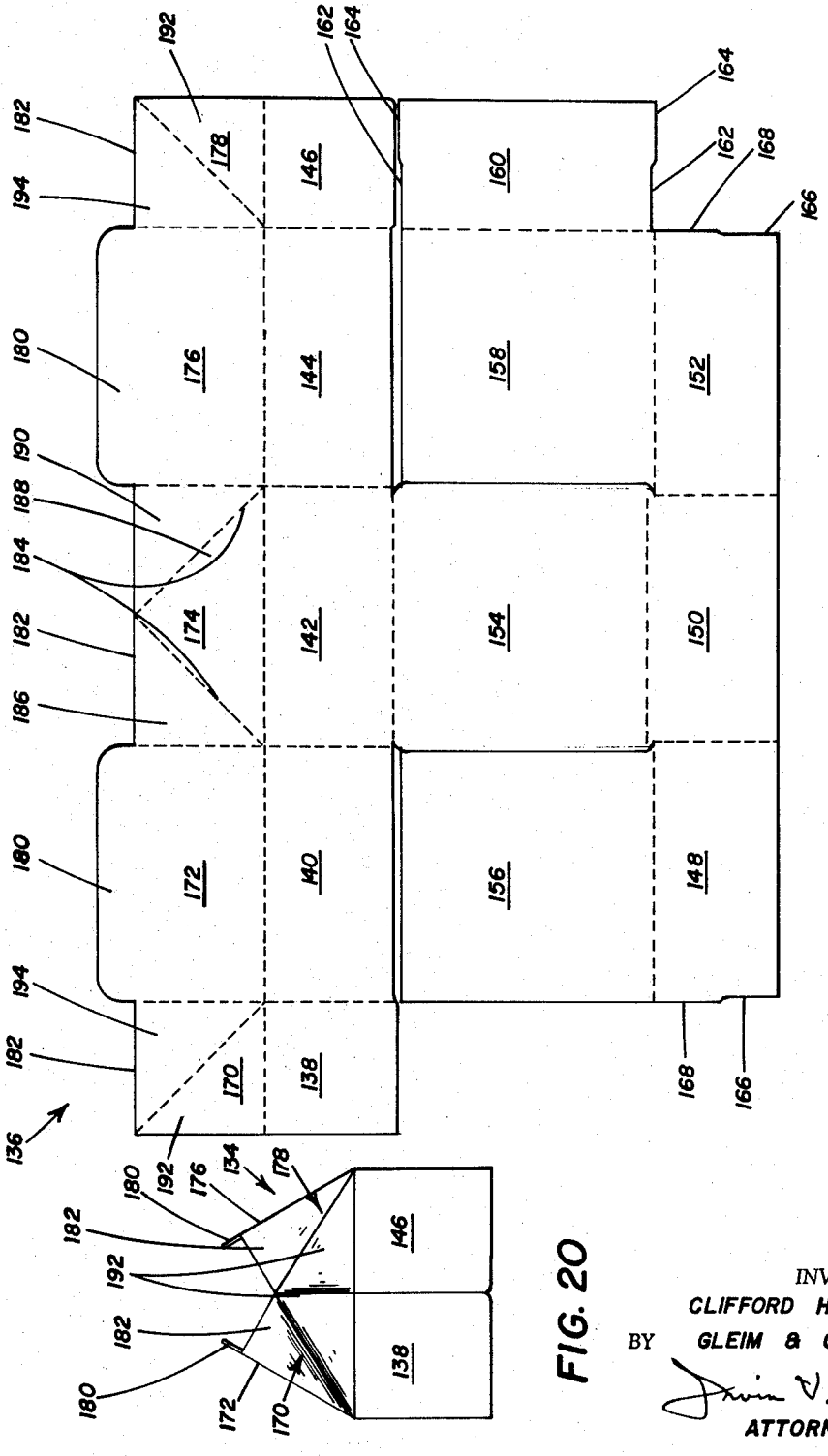


FIG. 21

FIG. 20

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BY GLEIM & CANDOR
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ATTORNEYS

Dec. 18, 1962 C. H. KEITH 3,069,062

REINFORCED CONTAINER AND BLANKS THEREFOR

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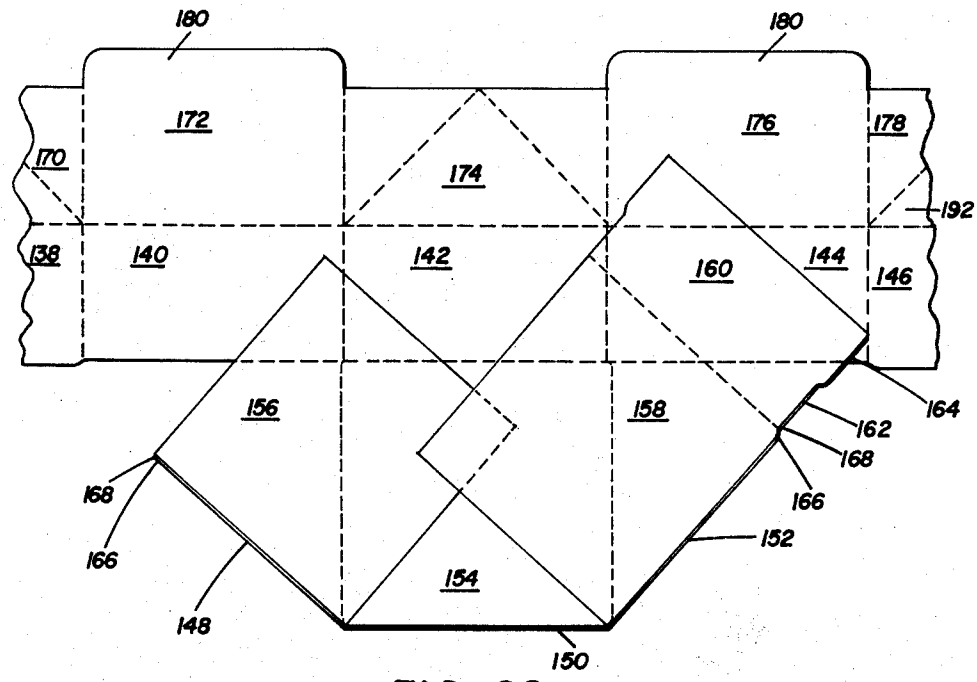


FIG. 22

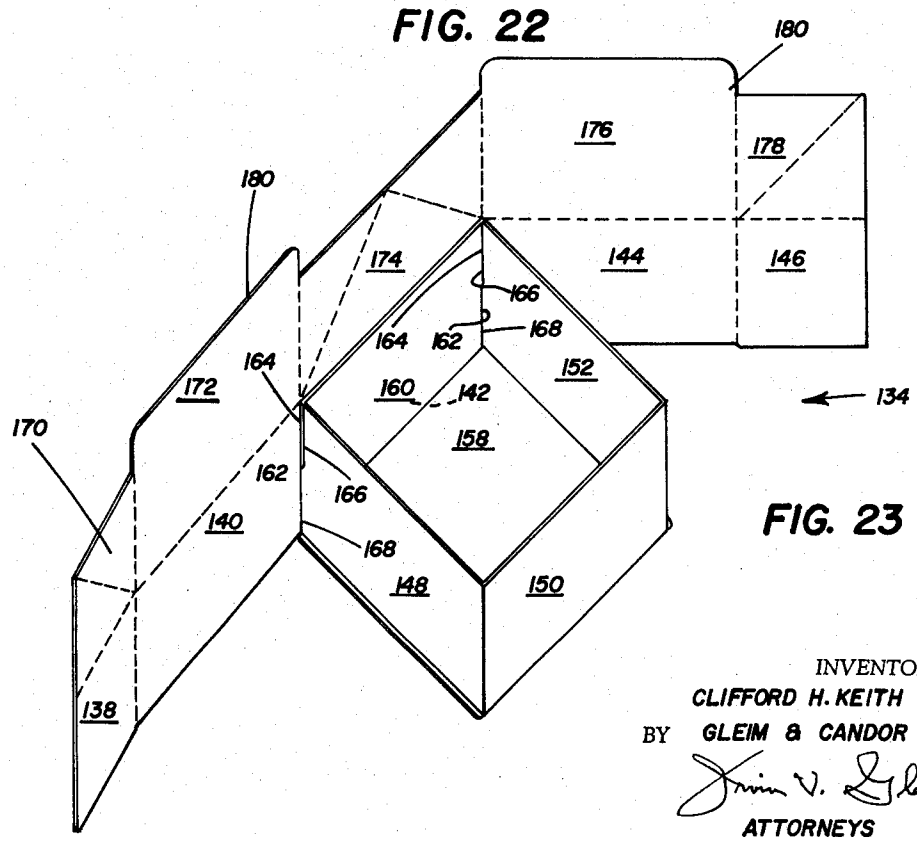


FIG. 23

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Dec. 18, 1962 C. H. KEITH 3,069,062

REINFORCED CONTAINER AND BLANKS THEREFOR

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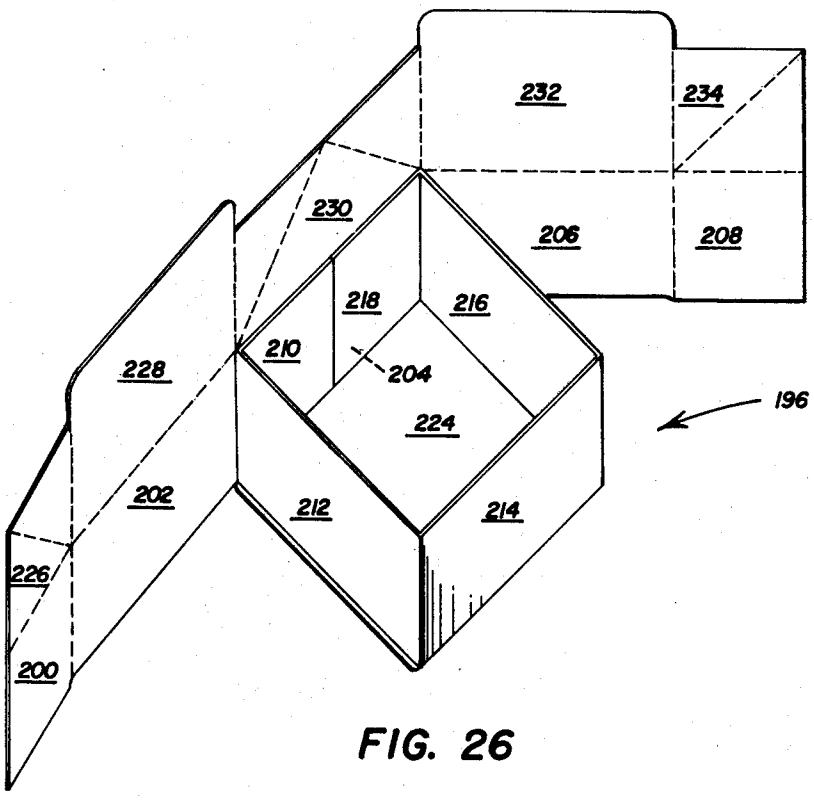


FIG. 26

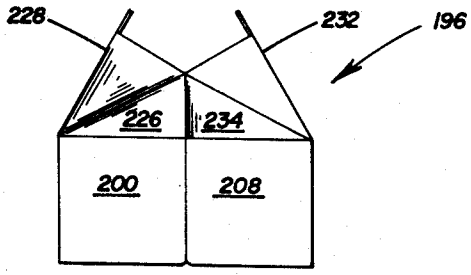


FIG. 24

INVENTOR.
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Dec. 18, 1962 C. H. KEITH 3,069,062

REINFORCED CONTAINER AND BLANKS THEREFOR

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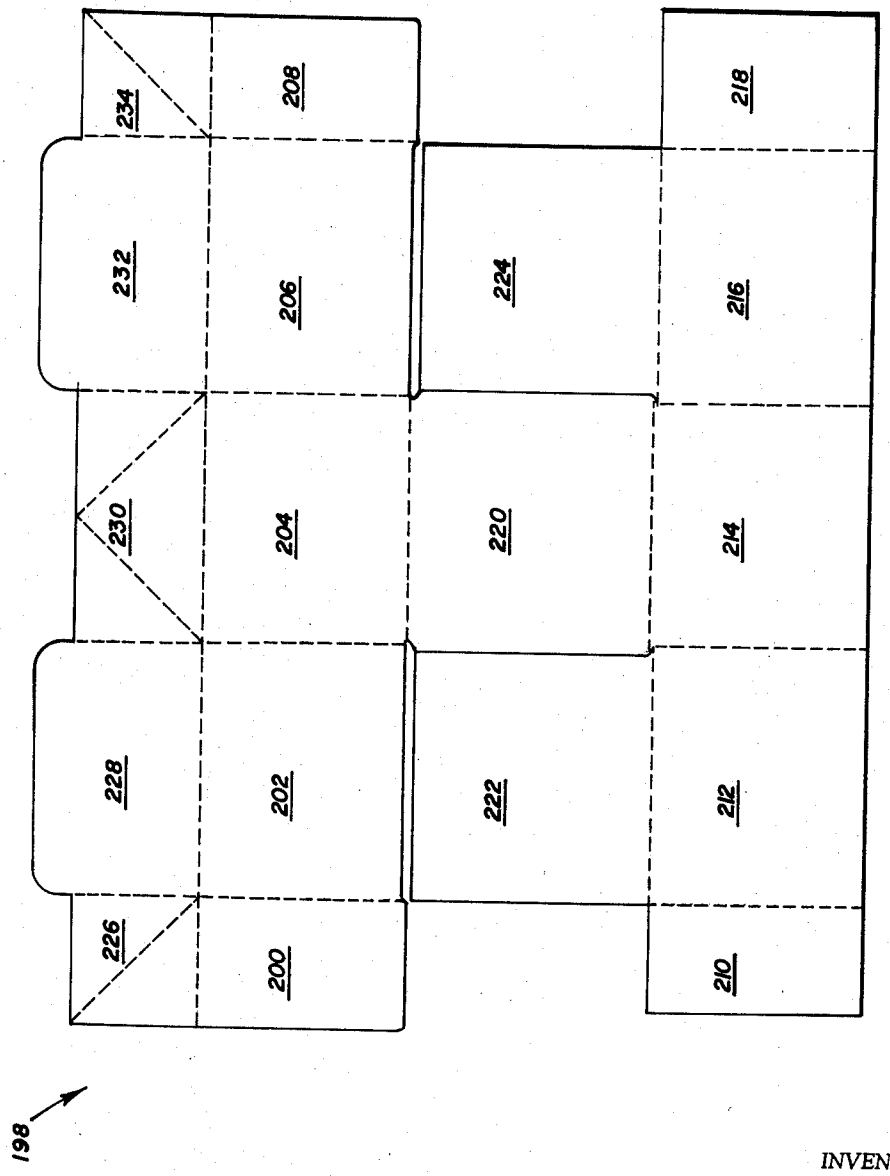


FIG. 25

INVENTOR.
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Dec. 18, 1962 C. H. KEITH 3,069,062

REINFORCED CONTAINER AND BLANKS THEREFOR

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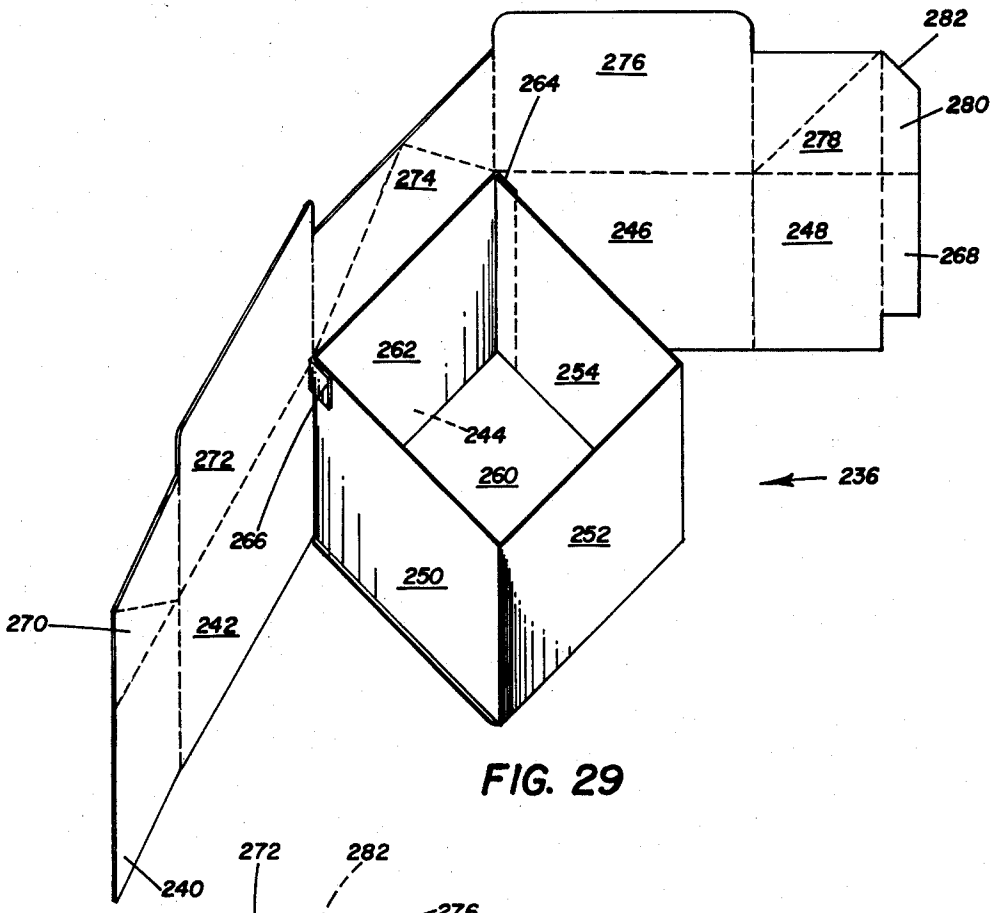


FIG. 29

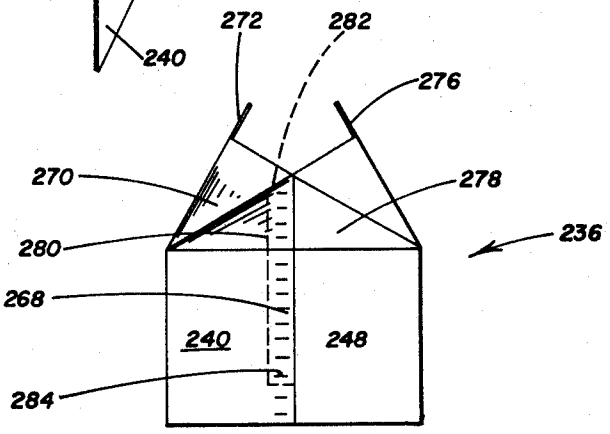


FIG. 27

INVENTOR.
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REINFORCED CONTAINER AND BLANKS THEREFOR

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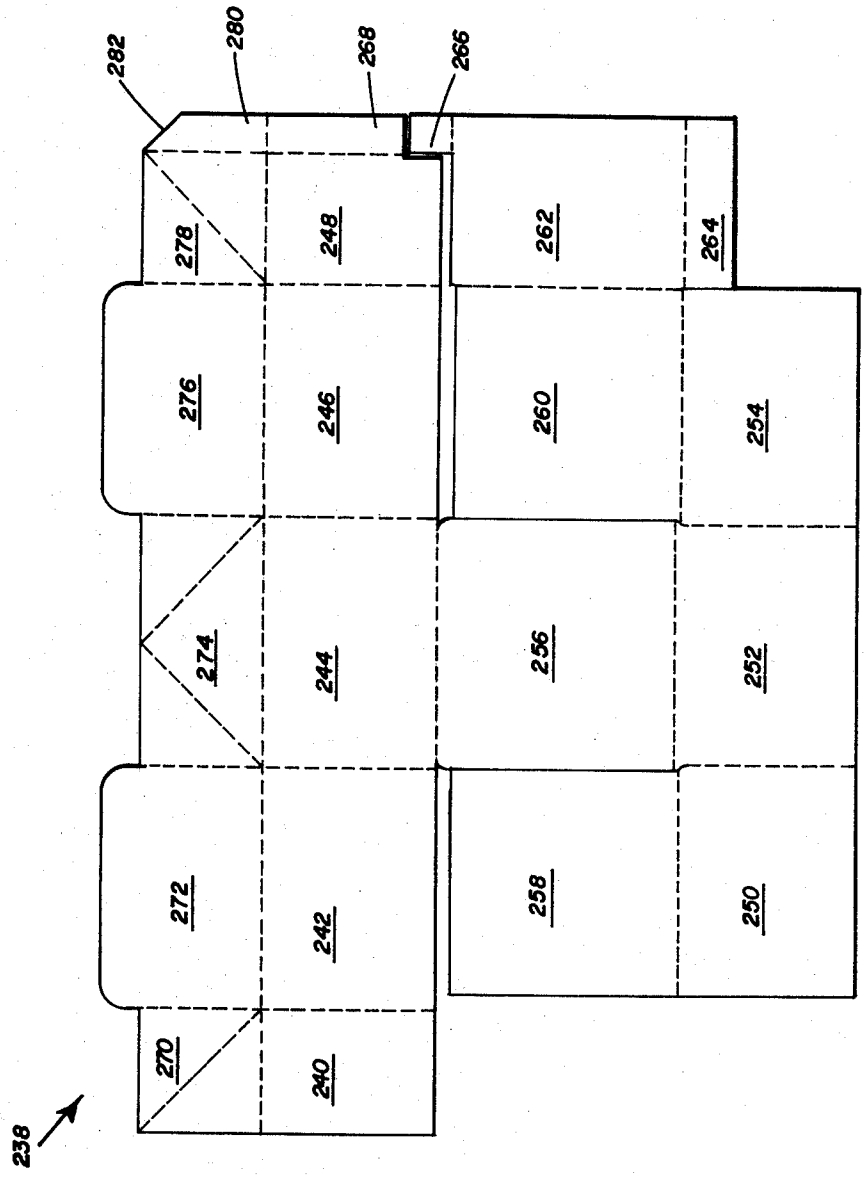


FIG. 28

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Dec. 18, 1962 C. H. KEITH 3,069,062

REINFORCED CONTAINER AND BLANKS THEREFOR

Filed Sept. 30, 1959 18 Sheets-Sheet 17

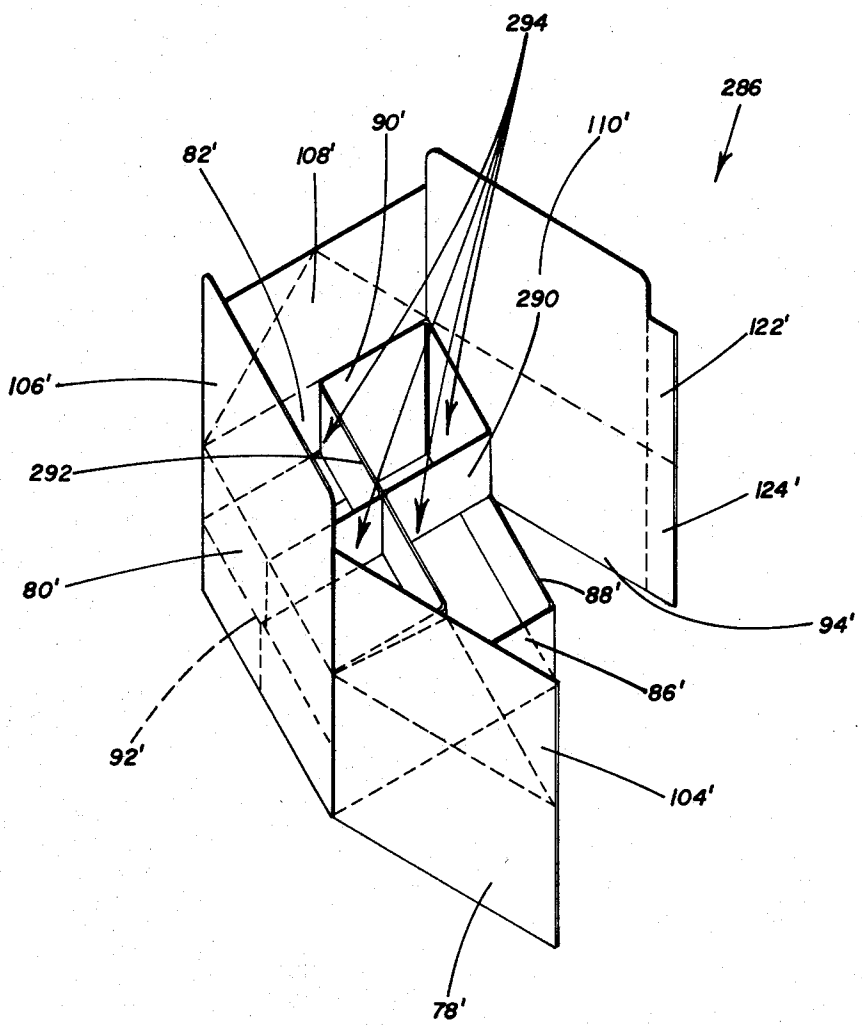


FIG. 30

INVENTOR.
CLIFFORD H. KEITH
BY GLEIM & CANDOR

Dec. 18, 1962 C. H. KEITH 3,069,062

REINFORCED CONTAINER AND BLANKS THEREFOR

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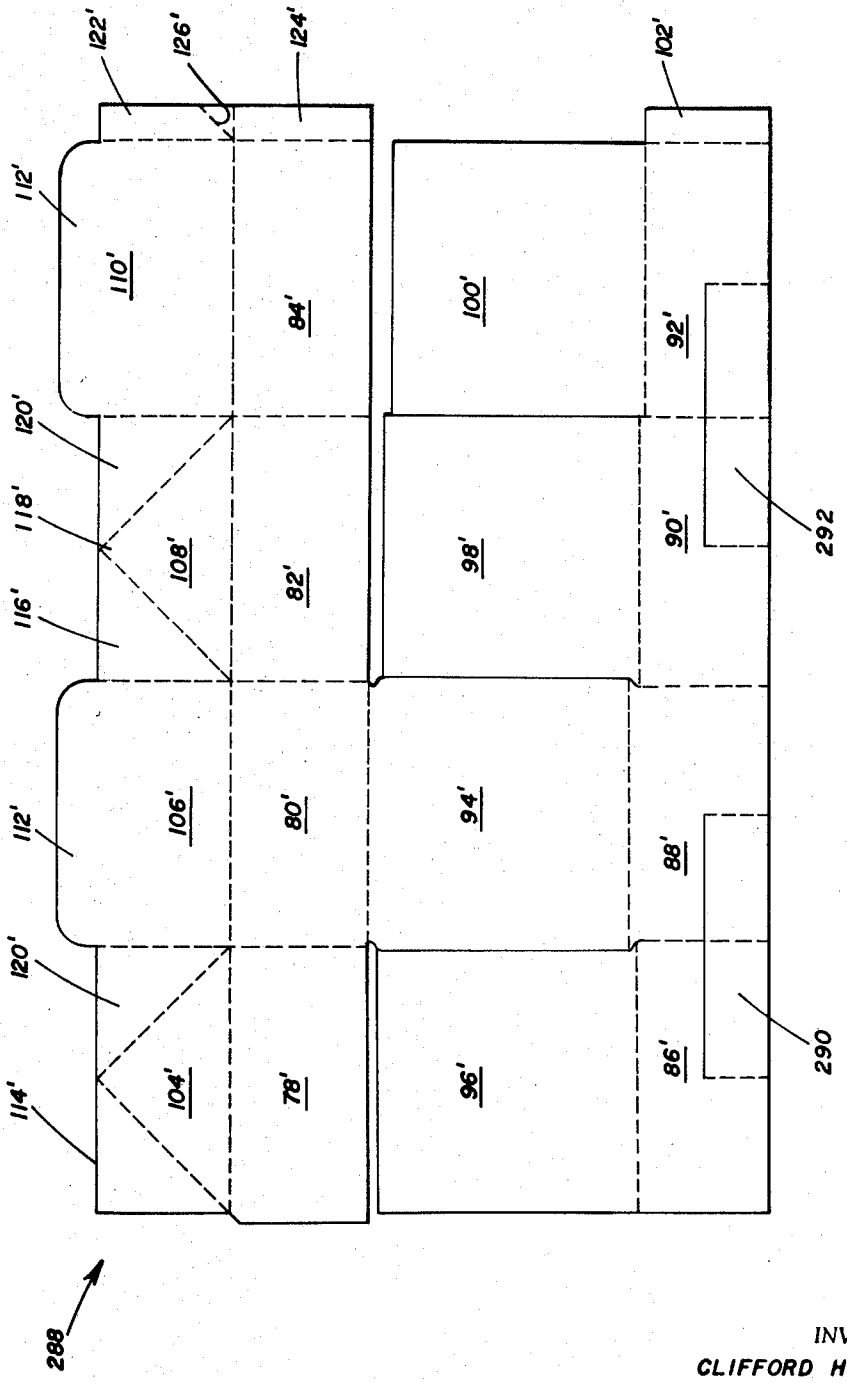


FIG. 31

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BY GLEIM & CANDOR
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ATTORNEYS

United States Patent Office 3,069,062 Patented Dec. 18, 1962

3,069,062 REINFORCED CONTAINER AND BLANKS THEREFOR

Clifford H. Keith, Cincinnati, Ohio, assignor to The Mead Corporation, Dayton, Ohio, a corporation of Ohio

Filed Sept. 30, 1959, Ser. No. 843,498
10 Claims. (Cl. 229—37)

This invention relates to improved containers and to improved blanks for making such containers. More specifically, this invention relates to heavy-duty containers being formed from paperboard or the like having reinforced bottoms, tops, and/or side walls thereof. This invention also relates specifically to improved blanks for forming such heavy-duty containers and the like.

This application is a continuation-in-part of my copending application entitled "Container Structure for Packaging Nails," Serial No. 768,691, filed October 21, 1958, now abandoned.

It is well known in the container art that ordinary paperboard containers can not be readily utilized for heavy-duty purposes as the conventional structures lack sufficient strength and reinforcement means to support the relatively heavy loads of high density goods, non-rigid goods, and the like. Accordingly, when conventional paperboard containers are utilized for shipping and/or storing high density goods and the like, the heavy loads of the goods that are imposed against the various walls of the containers tend to rupture the same thereby resulting in subsequent loss and/or damage to the goods.

Many unsuccessful attempts have been made by various manufacturers in the past to provide a heavy-duty container that is relatively inexpensive to manufacture, relatively easy to assemble, and which is provided with sufficient reinforcing means to support the relatively heavy loads of high density goods and the like.

Accordingly, it is an object of the present invention to provide an improved heavy-duty container.

It is another object of the present invention to provide an improved container blank for forming such a container.

Another object of the present invention is to provide an improved closure means for containers and the like.

Other objects, uses and advantages of the present invention will become apparent from a reading of the following specification taken in conjunction with the accompanying drawings forming a part hereof and wherein:

FIGURE 1 is a perspective view illustrating a collapsed paperboard structure formed in accordance with the teachings of this invention;

FIGURE 2 is a cross-sectional detail view of the container illustrated in FIGURE 1 and is taken on line 2—2 thereof;

FIGURE 3 is another cross-sectional detail view taken substantially on line 3—3 of FIGURE 1;

FIGURE 4 is a further perspective view showing the paperboard container structure of FIGURE 1 in its erect position;

FIGURE 5 is a cross-sectional view of the container illustrated in FIGURE 4 and is taken on line 5—5 thereof;

FIGURE 6 is a top view of the container illustrated in FIGURE 4;

FIGURE 7 is a plan view of a blank formed in accordance with the teachings of this invention, the blank forming the paperboard structure illustrated in FIGURES 1–6;

FIGURE 8 is a corresponding plan view illustrating the first folding step in forming the container structure of FIGURE 1 from the blank shown in FIGURE 7;

FIGURE 9 is a further corresponding plan view showing the second blank folding step by which the assembly of the liner elements is completed;

FIGURE 10 is a further corresponding plan view showing the third blank folding step by which the assembled liner elements are disposed in relation to the outer side wall panels;

FIGURE 11 is a further corresponding plan view showing the final blank folding step by which the assembly of the container structure elements is completed in collapsed form ready for securing to provide the container structure as shown in FIGURE 1;

FIGURE 12 is a perspective view of a container structure forming another embodiment of this invention;

FIGURE 13 is a plan view of another blank formed in accordance with the teachings of this invention, the blank forming the container structure illustrated in FIGURE 12;

FIGURE 14 is a plan view illustrating one method for folding certain of the panels of the blank illustrated in FIGURE 13;

FIGURE 15 illustrates the blank of FIGURE 13 folded into another of its folded positions;

FIGURE 16 is a perspective view of the blank illustrated in FIGURE 13 and illustrates the blank in another of its folded positions;

FIGURE 17 is a perspective view of the blank illustrated in FIGURE 13 and illustrates the blank in its partially assembled position;

FIGURE 18 is a perspective view of the container illustrated in FIGURE 12 and illustrates the same in its partially opened position;

FIGURE 19 is a side view of the container illustrated in FIGURE 12 and illustrates the method of closing the cover means thereof;

FIGURE 20 is a side view of a container structure illustrating another embodiment of this invention;

FIGURE 21 is a plan view of another blank of this invention, the blank forming the container structure illustrated in FIGURE 20;

FIGURE 22 is a view similar to FIGURE 14 and illustrates one method for folding certain of the panels of the blank shown in FIGURE 21;

FIGURE 23 is a perspective view of the partially folded blank of FIGURE 21;

FIGURE 24 is a side view of another container structure and illustrates another embodiment of this invention;

FIGURE 25 is a plan view of another blank of this invention, the blank forming the container structure illustrated in FIGURE 24;

FIGURE 26 is a perspective view of the partially folded blank of FIGURE 25;

FIGURE 27 is a side view of another container structure forming another embodiment of this invention;

FIGURE 28 is a plan view of another blank of this invention, the blank being utilized to form the container structure illustrated in FIGURE 27;

FIGURE 29 is a perspective view of the partially folded blank of FIGURE 28;

FIGURE 30 is a perspective view of another container formed in accordance with the teachings of this invention, the container being illustrated in its partially assembled condition; and

FIGURE 31 is a plan view of another blank of this invention, the blank forming the container structure illustrated in FIGURE 30.

While various container structures of this invention are hereinafter described as being particularly adapted for packaging nails, it is to be understood that these container structures are also readily applicable for packaging other types of high density goods, non-rigid goods, and the like and may also be utilized for any other desired purpose. Further, because of the double side walls of these con-

tainers, the same have increased up and down strength and, therefore, these containers can be stacked with greater security and alignment. In particular, these containers are readily adaptable for palletizing and unitizing.

Reference is now made to the accompanying drawings wherein like reference numerals are utilized throughout the various figures thereof to designate like parts where appropriate, and particular reference is made to FIGURES 1–11 illustrating one embodiment of this invention.

A container structure of this invention is shown in collapsed form in FIGURE 1 and in erect form in FIGURE 4, the container structure being indicated generally by the reference numeral **10**. An improved blank of this invention is illustrated in FIGURE 7 and may be utilized for forming the container structure **10** in a manner hereinafter described.

As shown in FIGURE 7, the illustrated container structure **10** of the present invention is formed from a substantially rectangular blank that is cut and scored to define a first series of four foldably connected side wall means or panels **12**, **14**, **16** and **18**, and a corresponding second series of foldably connected and substantially coextensive liner panel means or liner panels **20**, **22**, **24** and **26**, that are aligned in spaced relation with respect to the first panel series.

Between the respective adjacent edges of corresponding intermediate panels **16** and **24** and in each panel series, a connection panel **28** has opposed edges thereof foldably connected. This connecting panel **28** is foldably connected coextensively at the respective adjacent edges of the panels **16** and **24**, and the extent of the connecting panel **28** between these foldably connected edges corresponds substantially to the width of the respective panels **14** and **18**, and **22** and **26**, to each side of the panels at which it is foldably connected.

On each of the panels **20**, **22** and **26** of the second series, flap panels **30**, **32** and **34** are foldably connected at the inner edges thereof, and these flap panels **30**, **32** and **34** are substantially coextensive in relation to the previously mentioned connecting panel **28**. In addition, one terminal panel **20** of the second series has a side edge flap **36** foldably connected thereto. A similar side edge flap **38** is foldably connected to the terminal panel **12** of the first series, and the panels in this series have closure flaps **40**, **42**, **44** and **46** foldably connected at the outer edges thereof to complete the elements of the blank structure.

The collapsible nature of the container structure **10** of the present invention is provided for in the blank by medial scoring at **48** in the connecting panel **28** between the foldably connected edges thereof; and by further medial scoring at **50**, **52**, **54** and **56** in the respective first series panels **14** and **18**, and second series panels **22** and **26**, at each side of the panels to which the connecting panel **28** is foldably connected, as well as by aligned medial scoring at **58**, **60**, **62** and **64** in the respectively related closure flaps **42** and **46**, and flap panels **32** and **34**.

In addition, the blank is further preferably formed with a tear tab **66** slit at the free edge of the side edge flap **38** on the terminal panel **12** of the first series in spaced relation from the outer edges of the panels of this first series, and in alignment with spaced scores **68** (see FIGURES 1, 4 and 11) extending continuously across all of the first series panels **12**, **14**, **16** and **18** at the faces thereof opposite those shown in FIGURE 7, while a high strength reinforcing tape **70**, such as a fiber glass tape, is applied across the inner faces of these panels in alignment with the tear tab **66** and tear strip **68**, so as to provide for convenient opening of the container structure **10** to obtain access readily to a package load secured therein.

In forming the container structure **10** according to the present invention from the blank shown in FIGURE 7, the first step consists in folding flap panels **30**, **32** and **34** downwardly in doubled relation with respect to the panels **20**, **22** and **26** of the second series on which they are foldably connected so as to arrange the blank elements in the form illustrated in FIGURE 8.

Next the second series panels **20**, **22**, **24** and **26** are folded to the assembled relation shown in FIGURE 9 by doubling the panels **22** and **26** of this series at the medial scores **54** and **56**, therein, the aligned medial scores **62** and **64** providing at the same time for similar doubling of the flap panels **32** and **34** inwardly thereof.

The thus assembled second series panels **20**, **22**, **24** and **26** are then placed in adjacent relation with respect to the panels of the first series by folding upwardly about the medial score **48** in the connecting panel **28**, as illustrated in FIGURE 10, so that the panel **20** of the second series is disposed in face-to-face relation with respect to panel **16** of the first series, and so that panels **14** and **18** of the first series may be doubled about the medial scores **50** and **52** therein to complete the folding of the blank elements, in the form shown in FIGURE 11, for securing at the side edge flap **38**, as by stapling at **72**, to provide the container structure **10** of the present invention in collapsed form as seen in FIGURE 1.

To set up this collapsed carton structure **10** to the erect form shown in FIGURE 4, it is only necessary to push inwardly on the medially scored panels **14** and **18** of the first series so as to square up the container structure **10**, and then fold downwardly the flap panel **30** to a position overlying the connecting panel **28** in order to hold the container structure **10** in this squared position, whereupon the other medially scored flap panels **32** and **34** may be additionally folded downwardly to overlie the connecting panel **28** as well.

In this erect form, the panels **12**, **14**, **16** and **18** of the first series form the outer side walls of the container structure **10**, with the closure flaps **40**, **42**, **44** and **46** thereon extending upwardly to form an open top for filling that may subsequently be closed in the usual manner. The outer bottom wall of the container structure **10** is formed by the connecting panel **28**, with the additional flap members **30**, **32** and **34** serving to complete a bottom in the container structure of four thicknesses. The remaining panels **20**, **22**, **24** and **26** of the second series form liner elements within the container structure **10** so that a double thickness of paperboard is provided at all of the side walls.

Upon filling of the container structure **10**, a top pad may be placed therein, if desired, and the closing of the top end completed by simply folding and securing the top closure flaps **40**, **42**, **44** and **46** in the usual overlapping relation. The flap member **30** is provided on the liner panel **20** of the second series and may alternatively be separated and used as a top pad in the container structure **10**, while still leaving a bottom of three thicknesses therein. Also, the medial scoring of the liner element panel **26** and the flap panel **34** thereon may be eliminated to increase the bracing action of these elements when the container structure **10** is erected. Either of these changes may be made in the container structure **10** without otherwise substantially changing the manner in which it is folded from the initial blank form to assembled collapsed form, or the manner in which it is set up to erect form.

The container structure **10** while being adapted for many uses, is particularly adapted for packaging nails as prior known paperboard nail container structures require tedious and time-consuming set-up operations in assembling the container structures from blanks as well as involving a considerable packaging material inventory and a substantial allotment of space for the container assembly operations. The strength requirements for packaging nails also make it necessary to provide reinforcing liner elements in the container structure, and it has been found in the past particularly difficult to hold these liner elements properly in place during nail packaging operations

which involve a shaking of the package as it is filled with nails so as to obtain a compact package unit. In addition, these prior known paperboard nail container structures require bottom as well as top sealing which is difficult to accomplish readily with heavy package loads such as are involved in packaging nails.

The paperboard container structure **10** provided according to the present invention simplifies and expedites very substantially the handling required in preparing and using it for packaging. This improved container structure **10** is formed from a unitary blank and arranged so that it may be pre-assembled in collapsed form for simple and rapid erection in practice for use. The unitary nature of the container structure **10** thus provided, integrates the liner elements thereof in a manner that obviates any displacement of these elements during the packaging operation, and also results in forming an initially closed bottom end upon erection that eliminates the necessity for any bottom sealing whatsoever in completing the packaging operation.

Another container structure of this invention is illustrated in FIGURE 12 and is generally indicated by reference numeral **74**. The container structure **74** may be made from an improved blank of this invention illustrated in FIGURE 13 and generally indicated by reference numeral **76**.

The substantially rectangular blank **76** is suitably cut and scored to define a first series of foldably connected side wall means or panels **78, 80, 82** and **84**, and a second series of foldably connected liner panel means or panels **86, 88, 90** and **92**. The side wall means **78, 80, 82** and **84** are utilized to form the four outside side walls of the container structure **74** and the liner panel means **86, 88, 90** and **92** are utilized to form the four inside walls of the container structure **74** in a manner hereinafter described.

A bottom wall or connecting panel **94** is respectively foldably connected at opposed side edges thereof to the bottom edges of the panels **80** and **88**. Bottom walls or panels **96, 98** and **100** are respectively foldably connected at one of the side edges thereof to the bottom edges of the liner panels **86, 90** and **92**. A narrow interlocking flap **102** is foldably connected to the terminal or outer side edge of the liner panel **92** for a purpose hereinafter described.

A series of foldably connected cover flap means or panels **104, 106, 108** and **110** are respectively foldably connected at the inner or side edges thereof to the outer or top edges of the side wall means or panels **78, 80, 82** and **84**. The cover flap means or panels **106** and **110** respectively have extensions or free ends **112** extending a predetermined distance beyond the outer edges **114** of the other pair of cover flap means **104** and **108**.

The cover flap means **104** and **108** are each scored and/or slit on the inner surface thereof to define three triangular sections **116, 118** and **120** which form a bellows structure more fully described hereinafter. The width of each cover flap means **104** or **108** is twice the height thereof for a purpose hereinafter set forth.

A pair of foldably connected fastening flaps **122** and **124** are respectively foldably connected to the terminal or outer edges of the respective panels **110** and **84**. The fastening flap **122** is angularly scored at **126** for a purpose hereinafter described.

To form the container structure **74** from the blank **76**, the blank **76** may be folded in many different ways, either manually or automatically, and, for the purpose of illustration and not limitation, one method for manually forming the carton structure **74** from the blank **76** is as follows. Similar methods of assembling the other container structures of this invention are also hereinafter set forth only for the purpose of illustrating one such folding method as many different methods may be utilized.

As shown in FIGURE 14, the liner panel means **86, 88, 90** and **92** are respectively bent perpendicular to the connecting bottom walls **96, 94, 98** and **100**. The bottom walls **96, 98** and **100** are superimposed respectively upon the bottom wall **94** in the order and in the manner illustrated in FIGURE 14 to provide a four sided structure having four bottom walls as illustrated in FIGURE 15. When the blank **76** is formed of corrugated paperboard and the like, it can be seen that certain of the corrugations in the bottom panels **96, 94, 98** and **100** extend transversely relative to certain of the corrugations of the other bottom walls whereby further reinforcing of the bottom of the container structure **74** is provided.

By merely grasping the bottom walls **96, 98** and **100** and superimposing them upon each other in the manner illustrated in FIGURE 14, the respective foldably connected liner panel means **86, 88, 90** and **92** will be automatically bent perpendicular to their respective bottom walls **96, 94, 98** and **100** by the bending action resulting from superimposing the bottom walls into the stacked position illustrated in FIGURE 15.

After the liner panel means **86, 88, 90** and **92** and bottom walls **96, 94, 98** and **100** have been folded and assembled in the manner illustrated in FIGURE 15, the flap **102**, foldably connected to the liner panel **92**, is bent around the outside surface of the liner panel **86** in the manner illustrated in FIGURE 15 to lock the liner panels **86, 88, 90** and **92** together. Subsequently, the liner panel and bottom wall structure is bent perpendicular to the side wall panel **80** in the manner illustrated in FIGURE 16, whereby the liner panel means **92** is disposed parallel to and closely adjacent the side wall means **80** to provide a double side wall at that particular side of the container structure **74**.

As shown in FIGURE 17, the side wall means **78** is superimposed upon the liner panel means **86**, and, similarly, the side wall means **82** and **84** are superimposed upon the liner panel means **90** and **88**.

The fastening flaps **122** and **124** are respectively disposed between the liner panel **86** and the terminal portions of the cover flap means **104** and side wall means **78** and are fastened respectively to the cover flap means **104** and side wall means **78** in any suitable manner such as by gluing, stapling or the like. In the embodiment illustrated in the drawings, the fastening flaps **122** and **124** are secured respectively to the cover flap means **104** and side wall means **78** by staples **128**. The staples **128** may extend through the lower fastening flap **124** into the liner panel **86** to secure the side wall means **78**, the fastening flap **124** and liner panel means **86** together, if desired.

When it is desired to completely close the container structure **74**, the opposed pair of outer flap cover means **106** and **110** are bent downwardly toward the container structure **74** whereby the other pair of opposed inner cover flap means **104** and **108** form bellows structures therewith as the intermediate triangular sections **118** thereof project inwardly toward each other in the manner illustrated in FIGURES 18 and 19. As the outer cover flap means **106** and **110** are brought together in the manner illustrated in FIGURE 19, one of the free ends **112** of either cover flap means **106** or **110** is received under the free end **112** of the other cover flap means **106** or **110**. In the embodiment illustrated in FIGURE 19, the free end **112** of the cover flap means **110** is received between the cover flap means **106** and the respective triangular portions **120** and **116** of the inner cover flap means **104** and **108**.

Further downward movement of the cover flap means **106** and **110**, from the position illustrated in FIGURE 19 to the position illustrated in FIGURE 12, permits the cover flap means **106** and **110** to be disposed substantially parallel to each other and substantially perpendicular to the respective side wall means **80** and **84** without bending the free ends **112** of the cover flap means **106** and **110**. The free ends **112** of the cover flap means **106** and **110**

are respectively adapted to overlap a portion of the other cover flap means **106, 110** when the cover means are disposed in the position illustrated in FIGURE 12.

In order to maintain the cover flap means **108** and **110** in the closed position illustrated in FIGURE 12, a suitable binding strap **130** formed of metal or the like can be secured around the container structure **74** and fastened as at **132**. Since the free ends **112** of the cover flap means **106** and **110** respectively overlap portions of the cover panel means **106** and **110**, a substantially large reinforced area of the cover is provided for receiving the strap **130**. In this manner, the strap **130** will not tend to cut into the top edges of the side walls **78** and **82** of the container structure **74** when the strap **130** is drawn tightly around the container structure **75**.

It can be seen that the blank **76** forms a container structure having reinforced bottom, sides, and top whereby the container structure can be utilized for transporting or storing high density goods. Further, when the container structure is closed in the above manner, other containers can be readily stacked thereon.

Another container structure of this invention is illustrated in FIGURE 20 and is generally indicated by the reference numeral **134**. The container structure **134** may be formed from an improved blank of this invention which is illustrated in FIGURE 21 and is generally indicated by reference numeral **136**.

The substantially rectangular container blank **136** is suitably cut and scored to define a first series of foldably connected side wall means or panels **138, 140, 142, 144** and **146** and a second series of foldably connected liner panel means **148, 150** and **152**.

A bottom wall or connecting panel **154** is respectively foldably connected at opposed side edges thereof to the bottom or inner edges of the side wall means **142** and liner panel means **150**. A pair of bottom walls or panels **156** and **158** are respectively foldably connected at one of the side edges thereof to the bottom edges of liner panel means **148** and **152**.

A fourth liner panel means **160** is foldably connected at its bottom edge to another side edge of the bottom wall or panel **158**. The inner or lower portions of the opposed side edges of the fourth liner panel means **160** are cut away to define notches **162** and tongues **164** at each of the side edges of liner panel means **160** for a purpose hereinafter described.

The outer or terminal side edges of liner panel means **148** and **152** are respectively cut away at the upper or outer portions thereof to form notches **166** and tongues **168** at each of the terminal edges of panel means **148** and **152**. The notches **166** and tongues **168** of liner panel means **148** and **152** are respectively adapted to cooperate with tongues **164** and notches **162** of fourth panel means **160** in a manner more fully described hereinafter.

A series of foldably connected cover flap means **170, 172, 174, 167** and **178** are respectively connected at the inner or side edges thereof to the top or outer edges of side wall means **138, 140, 142, 144** and **146**. The cover flap means **172** and **176** have a free end **180** extending outwardly from outer edges **182** of the other cover flap means **170, 174** and **178**.

The cover flap means **174** has a width equal to twice the heighth thereof and is scored at **184** to define three triangular sections **186, 188** and **190** in substantially the same manner that the cover flap means **104** and **108** of the blank **76** are scored. The cover flap means **170** and **178** are each diagonally scored to define two triangular sections **192** and **194**, the triangular sections **192** of the cover flap means **170** and **178** forming a triangular section substantially equal to the size of the triangular section **188** of the cover flap means **174** when terminal edges of cover flap means **170** and **178** are brought together in a manner hereinafter described. In this manner, cover flap means **174** and the combined cover flap means **170** and **178** provide a pair of opposed bellows structures for closing container structure **134** in substantially the same manner that container structure **74** is closed.

When it is desired to fold container blank **136** into a container structure similar to container structure **134** illustrated in FIGURE 20, the liner panel means **148, 150** and **152** are bent perpendicular to their respective bottom walls **156, 154** and **158**. The bottom wall **156** is then superimposed upon bottom wall **154** and, subsequently, bottom wall **158** is disposed upon bottom wall **156** in the manner illustrated in FIGURE 22 to provide a reinforced bottom for container structure **134**.

The liner panel means **148, 150** and **152** are thereby brought into the position illustrated in FIGURE 23, and by subsequently bending the bottom walls **154, 156** and **158** perpendicular to side wall means **142**, liner panel means **160** is disposed parallel to and closely adjacent to side wall means **142**. The tongues **164** of liner panel means **160** are respectively received in notches **166** of liner panel means **148** and **152**. Similarly, tongues **168** of liner panel means **148** and **152** are respectively received in notches **162** of liner panel means **160** in order to interlock liner panel means **148, 152** and **160** in the positions illustrated in FIGURE 23.

The side wall means **140** and **144** are then superimposed upon the liner panel means **148** and **152**.

Subsequently, the side wall means **138** and **146** are respectively superimposed upon adjacent portions of the remaining liner panel means **150** and are suitably secured thereto such as by gluing or the like. In this manner, side wall means **138, 140, 142, 144** and **146** define four outer side walls of the container structure **134** and liner panel means **148, 150, 152** and **160** define four inner side wall sides of container structure **134**.

When the side wall means **138** and **146** are superimposed and secured to liner panel means **150**, the terminal edges of the foldably connected cover flap means **170** and **178** mate to form a bellows structure similar to the bellows structure defined by cover flap means **174** whereby cover flap means **170, 172, 174, 176** and **178** open and close the container structure **134** in the same manner as the previously described cover means of container structure **74** illustrated in FIGURE 12.

Another container structure formed in accordance with the teachings of this invention is illustrated in FIGURE 24 and is generally indicated by reference numeral **196**. The container structure **196** may be formed from an improved blank of this invention which is illustrated in FIGURE 25 and is generally indicated by reference numeral **198**.

The substantially rectangular container blank **198** is suitably cut and scored to define a first series of foldably connected side wall means **200, 202, 204, 206** and **208** and a second series of foldably connected liner panel means or panels **210, 212, 214, 216** and **218**. A bottom wall or connecting panel **220** is respectively foldably connected at opposed side edges thereof to the bottom or inner edges of side wall means **204** and liner panel means **214**. A pair of bottom walls or panels **222** and **224** are respectively foldably connected at one of the side edges thereof to the bottom or inner edges of liner panel means **212** and **216**.

Another series of foldably connected cover flap means or panels **226, 228, 230, 232** and **234** are respectively foldably connected at their inner edges to the top edges of side wall means **200, 202, 204, 206** and **208**.

Since the particular function and structure of closure flap means **226, 228, 230, 232** and **234** of container blank **198** are substantially identical to the structure and function of cover flap means **170, 172, 174, 176** and **178** of container blank **136** illustrated in FIGURE 21, it is deemed not necessary to set forth the particular details and operation of cover flap means **226, 228, 230, 232** and **234** of container blank **198**.

When it is desired to form a container structure from

container blank **198**, liner panel means **210**, **212**, **214**, **216** and **218** are bent perpendicular to bottom walls **222**, **220** and **224** and bottom walls **222** and **224** are respectively superimposed upon bottom wall **220** in the same manner as bottom walls **156** and **158** of container blank **136** illustrated in FIGURE 22. The terminal or outer liner panel means **210** and **218** are then bent perpendicular to their foldably connected liner panel means **212** and **216** to form a fourth inner side wall of the container structure **196**. Subsequently, bottom walls **222**, **220** and **224** are bent perpendicular to side wall means **204** whereby mating liner panel means **210** and **218** are respectively disposed parallel to and closely adjacent to side wall means **204** in the manner illustrated in FIGURE 26.

The side wall means **202** and **206** are subsequently superimposed on respective liner panel means **212** and **216**, and side wall means **200** and **208** are respectively superimposed on adjacent portions of the remaining liner panel means **214** in the manner illustrated in FIGURE 24. The liner panel means **200** and **208** are suitably secured to liner panel means **214**, such as by stapling, gluing and the like.

The outside cover flap means **228** and **232** are adapted to close container structure **196** in the same manner that outside cover flap means **172** and **176** are adapted to close the container structure **134** illustrated in FIGURE 20.

Another container structure of this invention is illustrated in FIGURE 27 and is generally indicated by reference numeral **236**. The container structure **236** may be formed from an improved blank of this invention which is illustrated in FIGURE 28 and is generally indicated by reference numeral **238**.

The substantially rectangular container blank **238** is suitably cut and scored to define a first series of foldably connected side wall means or panels **240**, **242**, **244**, **246** and **248** and a second series of foldably connected liner panel means or panels **250**, **252** and **254**. A bottom wall or connecting panel **256** is respectively foldably connected at opposed side edges thereof to the inner or bottom edges of side wall means **244** and liner panel means **252**.

A pair of bottom walls or panels **258** and **260** are respectively foldably connected at one of the side edges thereof to inner or bottom edges of liner panel means **250** and **254**.

A fourth liner panel means or panel **262** is respectively foldably connected at the inner or bottom edge thereof to another side edge of the bottom wall **260**. The liner panel means **262** has an interlocking flap **264** foldably connected to one of the side edges thereof and another interlocking flap **266** foldably connected to the outer portion of the other side edge of liner panel means **262**. The interlocking flap **266** is partially carved out of a fastening flap **268** foldably connected to the outer or terminal side edge of side wall means **248**.

A series of foldably connected cover flap means **270**, **272**, **274**, **276** and **278** are respectively foldably connected to the top or outer edges of side wall means **240**, **242**, **244**, **246** and **248**.

Since cover flap means **270**, **272**, **274**, **276** and **278** are identical to and function in the same manner as cover flap means **170**, **172**, **174**, **176** and **178** of container blank **136** illustrated in FIGURE 21, the particular details of and operation of cover flap means **270**, **272**, **274**, **276** and **278** of container blank **238** will not be described.

However, a fastening flap **280** is foldably connected to the outer or terminal side edge of cover flap means **278** and is also foldably connected to fastening flap **268** previously described. The fastening flap **280** is angularly cut away at **282** for a purpose later to be described.

When it is desired to form a container structure from container blank **238**, liner panel means **250**, **252**, **254** are respectively bent perpendicular to their respective bottom walls **258**, **265** and **260**. The bottom wall **258** is superimposed on bottom wall **256** and bottom wall **260** is, in turn, superimposed upon bottom wall **258** in substantially the same manner as bottom walls **156**, **154** and **158** illustrated in FIGURE 22. Subsequently, liner panel means **262** is bent perpendicular to bottom wall **260** in the same manner as liner panel means **142** is bent relative to bottom wall **158** as illustrated in FIGURE 23.

The bottom walls **258**, **265**, **260** are then bent perpendicular to side wall means **244** whereby liner panel means **262** is disposed parallel to and closely adjacent to side wall means **244** in the manner illustrated in FIGURE 29.

Thereafter, side wall means **242** and **246** are respectively superimposed upon liner panel means **250** and **254** while respectively interlocking the interlocking flaps **266** and **264** therebetween. In this manner, liner panel means **262**, **250** and **252** and **254** are locked together by interlocking flaps **266** and **264**.

The side wall means **240** and **248** are subsequently superimposed upon adjacent portions of liner panel means **252**, fastening flaps **268** and **280** being respectively disposed beneath corresponding edge portions of the respective side wall means **240** and cover flap means **270** in the manner illustrated in FIGURE 27.

The edge portions of cover flap means **270** and side wall means **240** are respectively secured to fastening flaps **280** and **268** in any suitable manner, and, in the embodiment illustrated in the drawing, staples **284** fasten the edge portion of cover flap means **270** to fastening flap **280** and fasten the upper edge portion of side wall means **240** to fastening flap **268** and to a corresponding portion of liner panel means **252**. The staples **284** disposed below the fastening flap **268** secure the lower edge portion of side wall means **240** to a corresponding portion of side wall means **252**.

As shown in FIGURE 27, the angularly cut-away edge **282** of fastening flap **280** is superimposed behind diagonal score in the cover flap means **270** whereby fastening flap **280** does not interfere with the bellows structure defined by cover flap means **270** and **278**.

Another container formed in accordance with the teachings of this invention is illustrated in FIGURE 30 and is generally indicated by reference numeral **286**. The container **286** may be formed from another improved blank of this invention which is illustrated in FIGURE 31 and is generally indicated by reference nueral **288**.

The substantially rectangular blank **288** is substantially identical to blank **76** illustrated in FIGURE 13 except for certain features hereinafter described. Accordingly, parts of the blank **288** which are similar to corresponding parts of blank **76** are indicated by like reference numerals in FIGURE 31 followed by a prime mark.

The blank **288** is suitably cut and scored in substantially the same manner as blank **76** illustrated in FIGURE 13, except that a pair of foldable divider panels **290** and **292** are carved out of and are respectively foldably connected to adjacent pairs of liner panel means **86'**, **88'** and **90'**, **92'**. The divider panels **290** and **292** are adapted to selectively divide container structure **286** into four compartments in the following manner.

As shown in FIGURE 30, when it is desired to divide the container structure **286** into compartments, divider panels **290** and **292** are folded inwardly toward the center of container structure **286** whereby four compartments **294** are provided. If it is desired not to compartmentalize the container structure **286**, divider panels **290** and **292** are folded outwardly whereby the same cooperate with respective liner panel means **86'**, **88'**, **90'** and **92'** to form a double walled container structure similar to container structure **74** illustrated in FIGURE 17.

Therefore, it can be seen that the various container blanks of this invention each has a series of foldably connected side wall means which is adapted to eventually form the outer side walls of the resulting container structure. It can be further seen that the series of foldably

connected liner panel means, either alone or in combination with other liner panel means, forms the inner side walls of the resulting containers.

The various container structures provided above each include reinforced side walls, tops and bottoms whereby such containers are particularly adapted for transporting and storing high density goods, such as nails and the like.

While the foregoing presents preferred embodiments of the present invention, it is obvious that other modifications and/or equivalents may be employed without departing from the scope of the invention, which is defined in the appended claims.

What is claimed is:

1. A container comprising a first group of edge-joined panels including a first row of edge-joined panels folded at the edges thereof to define circumferentially continuous inner side walls of said container, a second group of edge-joined panels including a second row of edge-joined panels parallel to and spaced from said first row of panels and folded at the edges thereof and over and around said first row of panels to define circumferentially continuous outer side walls of said container, a bottom panel extending between and connected at opposite sides thereof to a side of one of the panels of each of said rows of panels, and a pair of substantially full-sized additional bottom panels one adjacent each side of said first bottom panel and folded to overlie said first bottom panel to reinforce the same, said additional bottom panels each being edge-joined to a side edge of one of the panels of said rows of panels, each of said rows of panels comprising three full-size side panels and a substantially half-size side panel at each end of each of said rows of panels, the mating ends of each row of panels being diametrically opposite each other and mating medially of the panels of the other row laminated therewith, whereby each side wall of said container is fully two-ply and each corner is reinforced from top to bottom by two angularly and integrally joined adjacent panels for increased bursting strength and resistance to deformation by vertical forces such as produced by multiple stacking of like containers upon each other.

2. A container according to claim 1, said panels being defined by cuts and scored fold lines applied to a single piece of sheet material.

3. A container according to claim 2, said piece of sheet material being of generally rectangular outline for economy of material used.

4. A container according to claim 1, at least a major portion of the overlapping contiguous faces of said rows of panels being adhered to each other for increased container strength and increased wall rigidity.

5. A container comprising a first group of edge-joined panels including a first row of edge-joined panels folded at the edges thereof to define circumferentially continuous inner side walls of said container, a second group of edge-joined panels including a second row of edge-joined panels parallel to and spaced from said first row of panels and folded at the edges thereof and over and around said first row of panels to define circumferentially continuous outer side walls of said container, a bottom panel extending between and connected at opposite sides thereof to a side of one of the panels of each of said rows of panels, and a pair of substantially full-sized additional bottom panels one adjacent each side of said first bottom panel and folded to overlie said first bottom panel to reinforce the same, said additional bottom panels each being edge-joined to a side edge of one of the panels of said rows of panels, the end panels of each of said rows of panels being partial panels of sizes for at least substantially meeting edgewise to provide with its coextensive panel of the other row of panels a fully two-ply side wall, with the mating edges of said partial panels disposed medially of said coextensive panel and on the opposite side of said container from the mating edges of the other row of panels, for providing increased strength against bursting and against vertical deformation at the corners of said container.

6. A container according to claim 5, said panels being defined by cuts and scored fold lines applied to a single piece of sheet material.

7. A container according to claim 6, said piece of sheet material being of generally rectangular outline for economy of material used.

8. A container according to claim 5, at least a major portion of the overlapping contiguous faces of said rows of panels being adhered to each other for increased bursting strength and increased wall rigidity.

9. A container according to claim 1 additionally comprising a pair of outside cover flap means respectively foldably connected to the upper edges of an opposed pair of said side walls, each of said outside cover flap means having a free end that overlaps a portion of the other outside flap means when said outside cover flap means are disposed substantially perpendicular to their respective side walls and substantially parallel to each other to close said open end of said container, and a pair of inside cover flap means respectively foldably connected to the other pair of said side walls, each of said inside cover flap means being foldably connected to said pair of outside cover flap means and defining a bellows structure therewith whereby said free ends of either one of said outside cover flap means is receivable between the other outside cover flap means and portions of said inside cover flap means when said container is closed, said outside cover flap means being free of weakening transverse fold lines.

10. A container according to claim 5 additionally comprising a pair of outside cover flap means respectively foldably connected to the upper edges of an opposed pair of said side walls, each of said outside cover flap means having a free end that overlaps a portion of the other outside flap means when said outside cover flap means are disposed substantially perpendicular to their respective side walls and substantially parallel to each other to close said open end of said container, and a pair of inside cover flap means respectively foldably connected to the other pair of said side walls, each of said inside cover flap means being foldably connected to said pair of outside cover flap means and defining a bellows structure therewith whereby said free ends of either one of said outside cover flap means is receivable between the other outside cover flap means and portions of said inside cover flap means when said container is closed, said outside cover flap means being free of weakening transverse fold lines.

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