June 26, 1951 M. I. WILLIAMSON 2,558,714

BOTTLE CARRIER

Filed Dec. 24, 1949 6 Sheets-Sheet 1

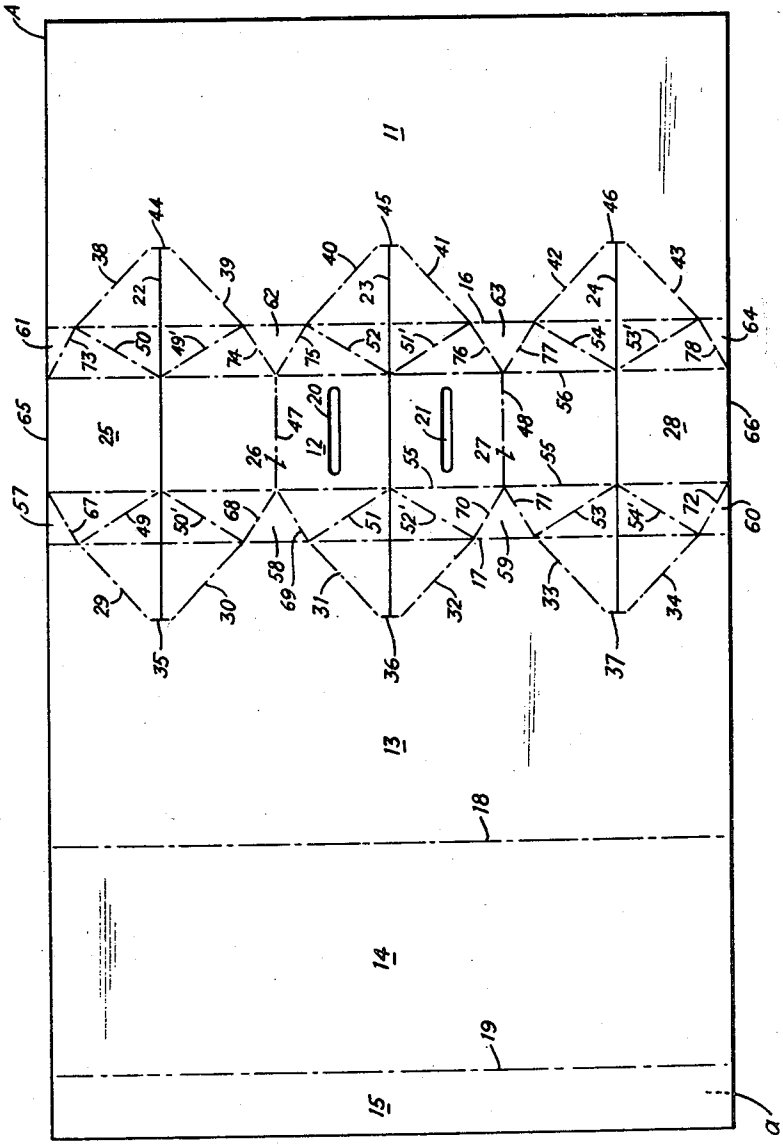


Fig. 1

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BOTTLE CARRIER

Filed Dec. 24, 1949 6 Sheets-Sheet 2

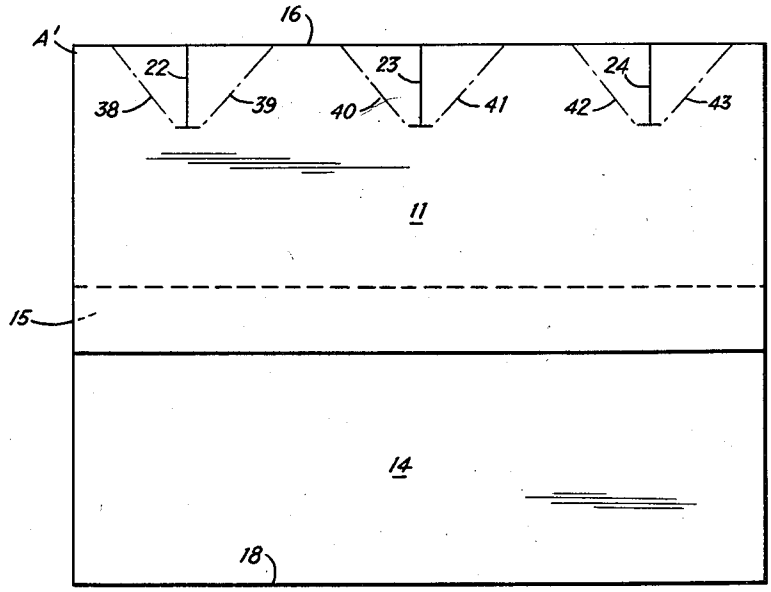


Fig. 2

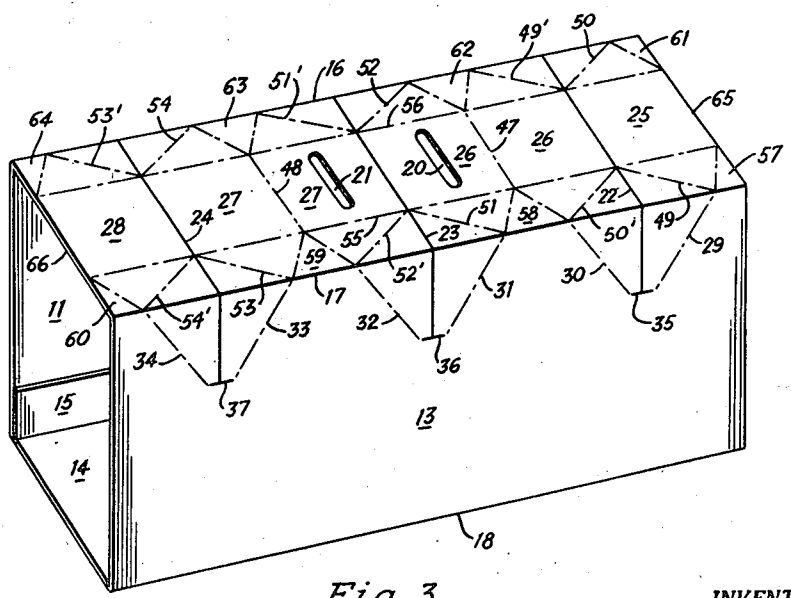


Fig. 3

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BOTTLE CARRIER

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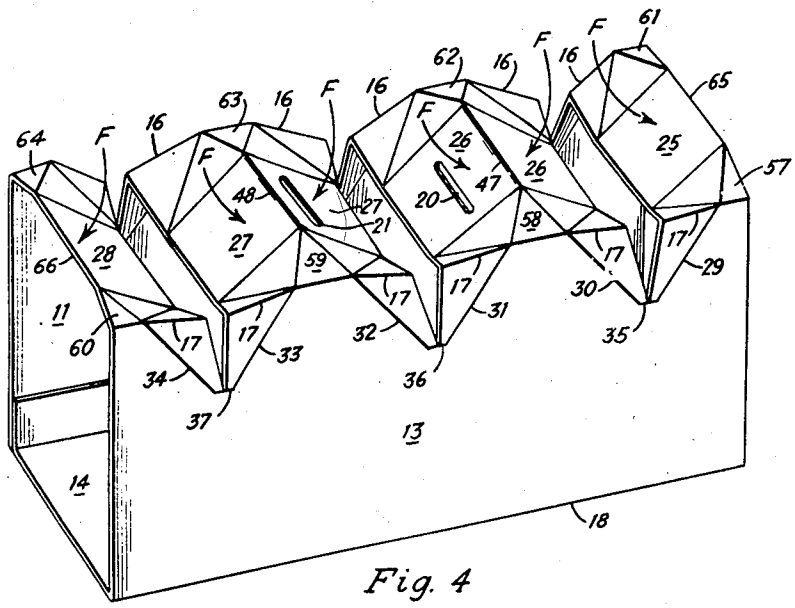


Fig. 4

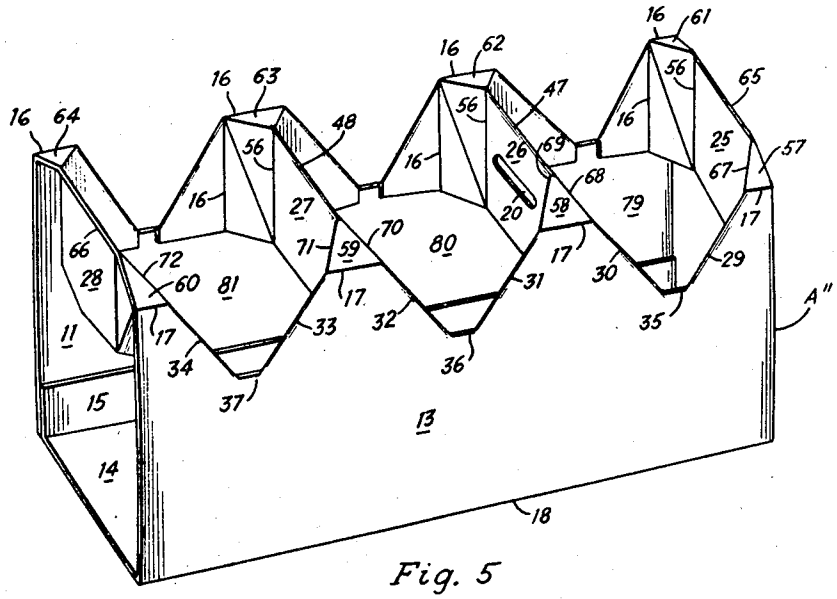


Fig. 5

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BOTTLE CARRIER

Filed Dec. 24, 1949 6 Sheets-Sheet 4

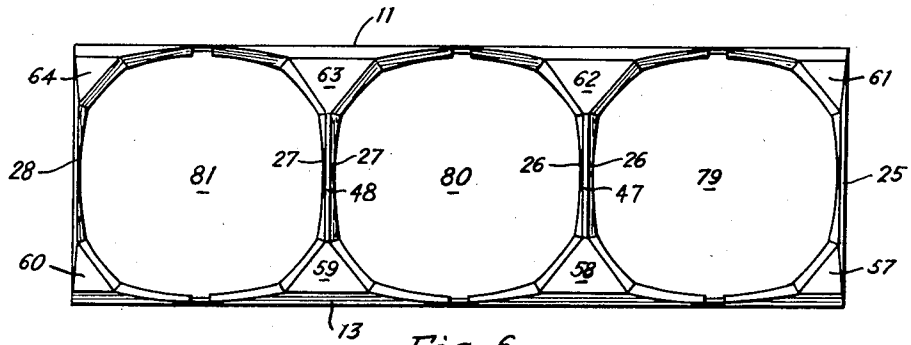


Fig. 6

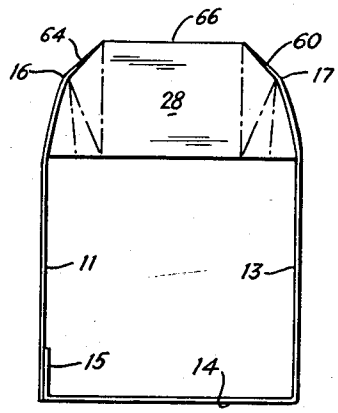


Fig. 7

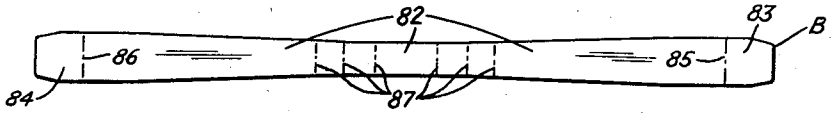


Fig. 8

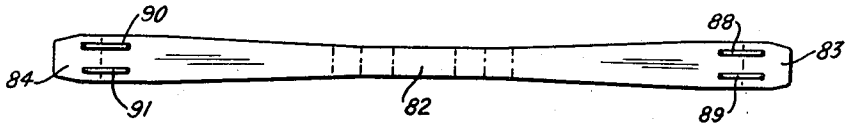


Fig. 9

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BOTTLE CARRIER

Filed Dec. 24, 1949 6 Sheets-Sheet 5

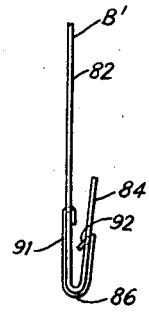


Fig. 10

Fig. 11

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BOTTLE CARRIER

Filed Dec. 24, 1949 6 Sheets-Sheet 6

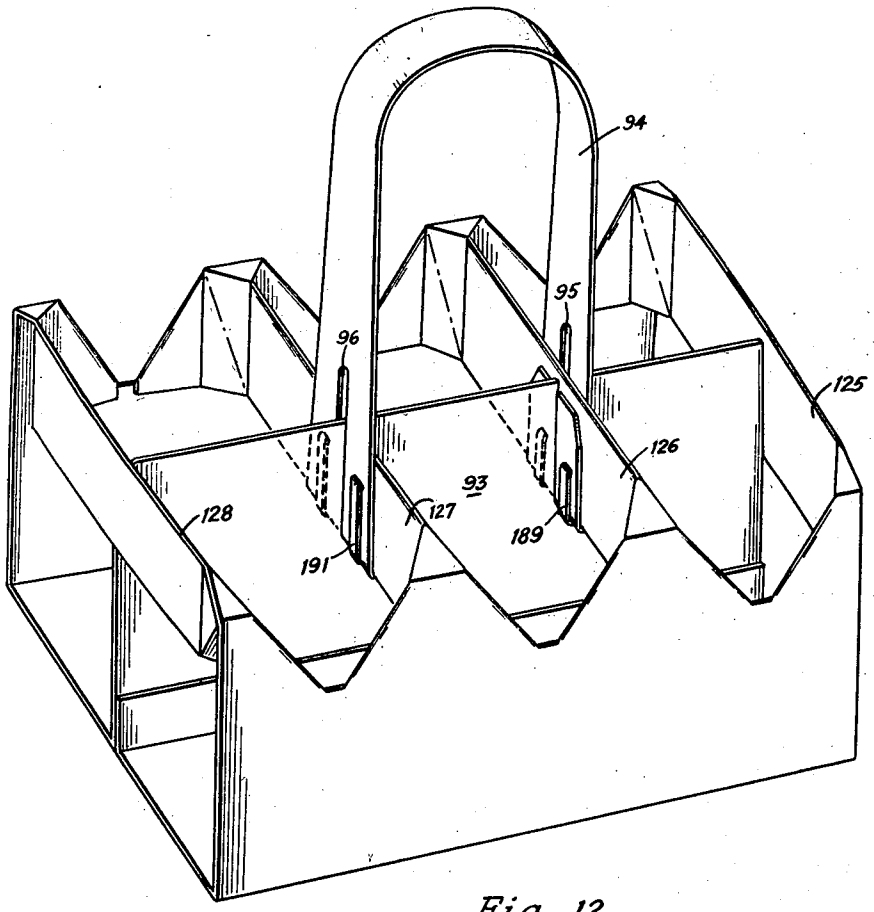


Fig. 12

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UNITED STATES PATENT OFFICE

2,558,714

BOTTLE CARRIER

Marshall I. Williamson, New Haven, Conn., assignor to National Folding Box Company, Inc., New Haven, Conn., a corporation of Connecticut

Application December 24, 1949, Serial No. 134,889

9 Claims. (Cl. 224—48)

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This invention relates to improvements in carriers made from foldable sheet material, such as paperboard, for packing a plurality of bottles, cans, jars, or similar articles as a unit which may easily be stacked by the dealer, carried home by the consumer and which, in addition, provides protection for the packaged articles.

Carriers of the aforementioned type are popularly referred to as "bottle carriers," and this term will be used hereinafter for convenience, although it is plain that a carrier for bottles is equally useful for the packaging of cans, jars, and similar articles of merchandise.

The commonly known bottle carriers may be divided into two groups, a first group comprising, those carriers in which the handle forms an integral, or non-detachable part of the carrier body, and a second group comprising those carriers in which the handle constitutes a separate element which may be attached to, or detached from, the carrier body.

Carriers equipped with an integral handle generally have the disadvantage of requiring more stock than carriers within second group. Also, the desirable feature of having a handle which extends above the tops of the bottles for convenient carrying and which is depressible below the tops of the bottles to permit stacking of loaded carriers complicates the construction and increases the cost of the carrier.

Carriers with a detachable handle have become popular in recent years because of certain advantages. Firstly, less stock is required for the carrier body and, secondly, the assembly of the carrier body is generally simpler and less expensive than the assembly of a carrier body with an integral handle. Prominent among carriers with a detachable handle are those in which the handle is formed from a piece of bent wire. Wire handles are sturdy and have the advantage of being salvageable for reuse with a new carrier body, after the initial body wears out, or is discarded by the bottler. Another advantage of the wire handle is the ease with which the handle can be made to telescope to move out of the way for the purpose of stacking loaded carriers.

However, the cost of wire handles is so high as to make their use prohibitive for one-trip-carriers, and often uneconomical for carriers which make only a few round trips between the bottler and the consumer. In addition, the cost of each wire handle mounts, in effect, every time it must be detached from a used carrier body and reassembled with a new carrier body. Another factor influencing the average cost of the wire

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handle is the fact that a certain percentage of handle equipped carriers are not returned, but are lost.

The present invention provides a carrier falling within the second of the aforementioned groups. The principal feature of the invention is the provision of a strap handle offering the same advantages as the conventional wire handle, but having the additional advantage of costing only a fraction of the cost of a wire handle. Strap handles incorporating the present invention are conveniently made from paperboard. The board, may, but need not necessarily, be reinformed with fabric or other reinforcing material, if the handle is to support an unusually great load or is to be used under unusually unfavorable conditions.

The idea of equipping a bottle carrier with a strap handle is basically not novel. Strap handles made from paperboard have previously been proposed for bottle carriers. However, the known strap handles, as far as can be ascertained, were constructed in such a form and were attached to the carrier body in such a way, as to become detached too easily.

The present invention is based on the recognition that the strength of the board used in a strap handle must be utilized in a most advantageous manner, if the handle is to remain securely attached to the carrier body, not only under ordinary conditions of use, but also under conditions of abuse, to which bottle carriers are frequently subjected. The strap handle provided by the present invention may be attached to any carrier body equipped with a plurality of transverse bottle separating top webs extending from one side wall of the carrier body to the other side wall, or from one side wall to a center partition and thence to the other side wall. The engagement of the strap handle provided by the present invention with the top webs is such that the strap handle engages the webs along the bottom edge of the webs, the handle being folded at the bottom edge and so constructed that unfolding under the load of the body is prevented.

The invention will be specifically explained by reference to a particularly advantageous form of carrier body forming the subject matter of a separate copending application for Letters Patent of Marshall I. Williamson, Serial Number 157,195, filed April 21, 1950. The carrier body comprises transverse webs constructed in such a way as to provide truss structures of extraordinary strength capable of distributing the total load evenly over the entire side walls of the carrier, and preventing concentration of the load at isolated transfer

points to the handle, in distinction from conventional carriers equipped with wire handles which provide a point-to-point type of engagement between handle and body, rather than an engagement of the edge-to-surface type. The improved strap handles provided by this invention are equally useful for carrier bodies in which the transverse webs are of single ply strength as they are for those in which the webs are of double ply strength.

The various features, objects and advantages of the invention will appear more fully from the detailed description which follows accompanied by drawings showing, for the purpose of illustration, preferred embodiments of the invention as applied to an illustrative form of carrier body. The invention also consists in certain new and original features of construction hereinafter set forth and claimed.

Although the characteristic features of the invention which are believed to be novel will be particularly pointed out in the claims appended hereto, the invention itself, its objects and advantages and the manner in which it may be carried out may be better understood from the detailed description in which:

Figure 1 is a plan view of a flat blank from which a carrier body may be made;

Figure 2 is a plan view of the blank of Figure 1 after an initial gluing and folding operation resulting in a flat tubular structure;

Figure 3 is a perspective view of the blank of Figure 2 after expansion into hollow form;

Figure 4 is a perspective view of the expanded blank of Figure 3 in the process of formation of its cellular top web structure;

Figure 5 is a perspective view of the completed carrier body after formation of its top web structure;

Figure 6 is a plan view of the completed carrier body shown in Figure 5;

Figure 7 is an elevational side view of the carrier body shown in Figure 5;

Figure 8 is a plan view of a flat blank for a strap handle;

Figure 9 is a plan view of the blank shown in Figure 8 after reinforcement by staples;

Figure 10 is a side view, on an enlarged scale of one of the ends of the strap shown in Figure 9 bent for attachment to a carrier body;

Figure 11 is a perspective view of the strap handle of Figures 9 and 10 attached to the carrier body of Figure 5; and

Figure 12 is a perspective view of a strap handle attached to a six cell carrier having a center partition.

In the following description and in the claims various details will be identified by specific names for convenience. The names, however, are intended to be as generic in their application as the art will permit. Corresponding reference characters refer to corresponding parts in the several figures of the drawings.

In the drawings accompanying and forming part of, this specification certain specific disclosure of the invention is made for the purpose of explanation of broader aspects of the invention, but it is understood that the details may be modified in various respects without departure from the broad principles of the invention and that the invention may be applied to other structures than the ones shown.

The blank A as shown in Figure 1 may be cut and scored, in multiple, from large rolls or sheets of foldable sheet material such as paperboard, on automatic cutting and scoring machines. The several constituent parts of the blank are set apart by fold or crease lines. The blank comprises a side wall panel **11**, a top wall panel **12**, a further side wall panel **13**, a bottom wall panel **14** and a glue lap **15** hingedly interconnected along fold lines **16**, **17**, **18**, and **19**, respectively. Elongated apertures **20** and **21** are cut in the top panel **11** for attachment of the handle, as will later appear.

The top panel **12** and adjoining portions of the side wall panels **11** and **13** are cut and scored to provide a cellular web structure forming individual compartments for bottles or other forms of merchandise. Cuts **22**, **23** and **24** extend at right angles to the fold lines **16** and **17**. These cuts separate the stock into webs **25**, **26**, **27** and **28** which after appropriate folding form article receiving cells, as will later appear.

The webs are foldable at a plurality of fold lines. These fold lines include diagonal or oblique fold lines **29**, **30**, **31**, **32**, **33** and **34** extending from short terminal cuts **35**, **36** and **37** to the transverse fold line **17** at an angle. Similar diagonal fold lines **38**, **39**, **40**, **41**, **42** and **43** extend from similar short terminal cuts **44**, **45**, and **46** to the transverse fold line **16** and preferably include between themselves the same angles as the fold lines **29**, **30**, **31**, **32**, **33** and **34**. The webs **25** and **28** constitute terminal webs since they lie at the outer edges of the blank. The webs **26** and **27** constitute intermediate webs. These intermediate webs comprise ridge fold lines **47** and **48** to provide for double ply thickness of the intermediate webs, as will later appear.

Folding of the web structure is facilitated by a plurality of crease lines **49**, **46'**, **50**, **50'**, **51**, **51'**, **52**, **52'**, **53**, **53'**, **54** and **54'**. These crease lines subdivide the several webs into individual web portions. It is evident that the angles at which these crease lines intersect, as well as their outline, depends on the width of the panel **12** measured between the fold lines **16** and **17** as well as the depth or height of the respective webs in the finished carrier body. Further transverse fold lines **55** and **56** extend across the blank to facilitate folding of the webs as will later become apparent.

Triangular panels **57**, **58**, **59**, **60**, and **61**, **62**, **63** and **64** extend with their apexes from either end of the ridges of the webs. These ridges, as will later appear, are formed by the ridge fold lines **47** and **48** and by the outer edge portions of the outer edges **65** and **66** of the blank A. The triangular panels are bounded by the transverse fold lines **17** and **16**, respectively, forming the bases of the triangles, and by further fold lines **67**, **68**, **69**, **70**, **71**, **72** and **73**, **74**, **75**, **76**, **77** and **78**, forming the sides of the triangles.

The assembly of the carrier body from the blank A may proceed as follows:

Adhesive *a* is first applied to the terminal glue lap **15** and the blank is folded about the fold line **18** to bring the panel **14** face-to-face with the panel **13**. Thereafter the blank is folded about the fold line **16** and the terminal portion of the panel **11** is pressed into adhesive engagement with the glue lap **15**. The resulting tubular structure A' is shown in Figure 2 and is ready for expansion into hollow form. Flat tubular blanks may be stored and shipped to the user in flat collapsed condition, requiring a minimum of space and may be set up into final form by a relatively simple assembly operation which may be performed at the bottling plant. These operations will now be described.

The tubular blank A is first squared to assume a substantially rectangular shape as shown in Figure 3. Article receiving cells 79, 80 and 81 are then formed, and the blank is fixed in expanded position by exertion of force in the direction of arrows F against the several web panels 25, 26, 27 and 28. This force causes the web panels to move towards a vertical position with respect to the bottom panel 14. Simultaneously the ridges 65, 47, 48 and 66 are raised and the triangular panels 57, 58, 59, 60 and 61, 62, 63 and 64 assume a slanting position as shown in Figure 4. Further pressure against the web panels and supplementary pressure against the tilting edges 16 and 17 causes the web panels to assume their final vertical position which they then automatically maintain due to a peculiar behavior inherent in the illustrated structure which may be compared to the action of the commonly known over-center spring which snaps into one or the other of two extreme positions after being forced past its center position. A center position is encountered in the present assembly between the positions of the edges 16 and 17 in Figures 4 and 5 respectively, and the aforementioned supplemental pressure exerted against these edges causes the web assembly to snap into the position shown in Figure 5.

The carrier body thus formed is extremely rigid and resistant to deformation due to the truss-like construction of the webs dividing the cells 79, 80 and 81 from one another.

Figures 6 and 7 show the completed carrier body in plan view and in end view, respectively. It is apparent from both figures that the side walls 11 and 13 have a tendency of sloping inwardly at about the height of the webs, and this inward slope then continues, in the manner of a mansard roof, in the triangular panels from whose apexes the horizontal ridges 65, 47, 48 and 66 extend.

The resulting carrier body possesses a surprising amount of strength and rigidity to a lifting force applied at the lower edges of the bottle separating webs, particularly to the webs 26 and 27 which are of double ply thickness. This peculiarity makes the carrier body admirably suited for use with a strap handle which will now be described.

Referring to Figure 8, the flat strap handle blank B consists of a central hand grip portion 82 and end portions 83 and 84 foldably connected to the central portion 82 along fold lines 85 and 86. The central portion 82 of the blank B may include a plurality of scores 87 to facilitate subsequent flexing of the handle into U-shape. However, the scores 87 are not indispensable and may be omitted.

The blank B is made from paperboard, preferably board having substantial tear strength. Kraft is suitable stock for the handle, and should preferably run lengthwise of the handle. Ordinarily it can be used in single ply strength without any reinforcement. However, if the handle is to be used under particularly unfavorable conditions, if the load is exceptionally great, or if it is desired to use stock of lower grade for the handle, the blank B may be made of laminated stock particularly stock including a fabric ply.

The shape of the blank B is optional. It may be made of equal width throughout, or as shown in Figure 8, the central portion may be made progressively narrower for more convenient gripping of the strap by hand. In the latter case the handle blanks may suitably be laid out in a continuous strip of board in such a way that the wider end portion of two handle blanks lie adjacent the narrow portion of an adjacent handle blank. It is preferable, although not necessary, to make the intermediate portions 83 and 84 of a width substantially equal to the width of the panels 26 and 27 of the webs, as measured between the fold lines 55 and 56.

The ends of the handle blank B are first reinforced by one or a plurality of metal staples at each end. The number of staples depends on the load to be carried, the width of the handle, and the gauge of the staple employed. In the illustrated form of handle two staples are used at each end. The staples 88, 89, 90 and 91 extend across the fold lines 85 and 86, respectively, and are preferably struck so that the ends of the staples within the end panels 83 and 84 are fully bent back upon or into the board, while the other ends of the staples are bent to remain at angle with respect to the board to form a barb 92 as shown in Figure 10 illustrating one end of the handle B' after bending into hook shape at the fold line 86. The portion of the staples within the end panel 84 is preferably shorter than the portion within the panel 82 to produce a tighter grip on the transverse web of the carrier body. The assembly of the strap handle B' with the carrier body A'' is simple and may be performed as follows:

The blank of the handle B is first flexed into substantially inverted U-shape, and is then hooked onto the webs 26 and 27 of the carrier body as shown in Figure 11. The barbs engage the apertures 20 and 21 in the webs and prevent subsequent disengagement of the handle from the carrier body. The load is sustained by the handle at the fold lines 85 and 86 which provide a surface-to-edge engagement with the lower edges of the transverse webs 26 and 27. The load tends to unbend the handle at the fold lines 85 and 86 which is effectively opposed by the stiffness of the staples 88, 89, 90 and 91 which thus serve the dual purpose of reinforcing the handles at critical points with regard to tear strength, and of adding to the stiffness of the handle at the same portions.

Te assembled handle is shown in perspective in Figure 11. The handle is very secure, and comparable in strength and load carrying capacity to the best conventional wire handles in spite of its far lower cost. For convenience of stacking loaded carriers the handle may be depressed into a position below the tops of bottles in the carrier. Pressure against the top of the handle causes the handle to flatten out slightly at the top. This deformation, however, does not cause the handle to become disengaged from the transverse webs 26 and 27 nor the barbs to be withdrawn from the apertures 20 and 21. The end portions 83 and 84 of the handle are maintained in their handle securing position not only by the staples but also by the pressure of bottles or other articles within the pockets 79, 80 and 81 bearing against the handle end portions 82, 83 and 84, respectively. The pressure of the bottles makes it obviously impossible for the handle to become disengaged from the carrier body under load. This is a safety feature of the handle construction.

Strap handles of the type shown in Figure 11 are not limited in their use to carriers in which bottles or other articles of merhcandise are carried in single file, but are equally useful for carrier bodies of the double row type.

A carrier for six bottles, cans, or similar articles is shown in Figure 12. The construction of

the carrier body 102 is very similar to that of the carrier body A'' except for the presence of a center partition 93 which divides the space between the webs 125, 126, 127 and 128 into six pockets. The webs 126 and 127 are of double ply thickness and include apertures similar to the apertures 20 and 21 in the carrier body A'' for engagement by the barbs of the handle 94. The barbs are formed by reinforcing staples in the same manner as shown in Figures 9 and 10, staples being visible at 189 and 191.

The handle 94 is of substantially the same outline as the handle B except for slits 95 and 96. The slits 95 and 96 facilitate the assembly of the handle 94 with the carrier body, in that the handle fits easily over the central partition 93.

The invention thus provides a strong and efficient handle for carriers comparable in strength to the best wire handles heretofore proposed. The improved strap handle can be produced at a fraction of the cost of a wire handle, and rests in the hand of the user more comfortably than a wire handle because of its larger grip surface. It has the advantage over the wire handle of engaging the carrier blank along the extended bottom edges of the webs rather than at isolated points of engagement as would be the case if a wire handle were used.

The carrier is considerably more reliable than any paperboard carrier with strap handle heretofore proposed in that its strength is not affected by swinging or rocking the loaded carrier about the point at which the handle is gripped by the user. The strength of the handle in this respect arises from the fact that the load is carried at creases of the handle and not at interlocks, cut edges, or projections which provide an edge-to-edge rather than an edge-to-surface engagement. This is a critical difference over known carriers which are extremely sensitive to such rocking which tends to disengage lock tabs at the ends of the strap handle from the carrier body. The present design avoids this weakness by critical changes of design without complicating the assembly of the carrier and handle or increasing their cost.

What is claimed is:

1. A bottle carrier comprising a carrier body consisting of a sheet of foldable material and including a bottom wall, side walls, and bottle separating top webs extending substantially at right angles with respect to the side walls and to the bottom wall; and a handle consisting of a separate strip of foldable sheet material, said handle including a central hand grip portion flexed substantially in the shape of a U, and an end portion on either end of the central portion, the end portion being foldable back upon the central portion to receive one of the webs in the fold between the central portion and the folded back end portion, said handle including provision for maintaining the end portions in folded back position resisting flattening out of the end portions into the plane of the adjoining central portion.

2. A bottle carrier comprising a carrier body consisting of a sheet of foldable material and including a bottom wall, side walls, and bottle separating top webs extending substantially at right angles with respect to the side walls and to the bottom wall; and a handle consisting of a separate strip of foldable sheet material, said handle including a central hand grip portion flexed substantially in the shape of a U, and an end portion either end of the central portion, the end portion being folded back upon the central portion to receive one of the webs in the fold between the central portion and the folded back end portion, and a ply of reinforcing material attached to the handle at each of the folds for maintaining the end portions in folded back position resisting flattening out of the end portions into the plane of the adjoining central portion.

3. A bottle carrier comprising a carrier body consisting of a sheet of foldable material and including a bottom wall, side walls, and bottle separating top webs extending substantially at right angles with respect to the side walls and to the bottom wall; and a handle consisting of a separate strip of foldable sheet material, said handle including a central hand grip portion flexed substantially in the shape of a U, and an end portion on either end of the central portion, the end portion being folded back upon the central portion to receive one of the webs in the fold between the central portion and the folded back end portion, and a metal stitch extending across each of the folds for maintaining the end portions in folded back position resisting flattening out of the end portion into the plane of the adjoining central portion.

4. A bottle carrier comprising a carrier body consisting of a sheet of foldable material and including a bottom wall, side walls, and bottle separating top webs extending substantially at right angles with respect to the side walls and to the bottom wall; and a handle consisting of a separate strip of foldable sheet material, said handle including a central hand grip portion flexed substantially in the shape of a U, and an end portion on either end of the central portion, the end portion being folded back upon the central portion to receive one of the webs in the fold between the central portion and the folded back end portion and a metal stitch extending across each of the folds, the metal stitch including two prong portions and a yoke portion connecting the prong portion, the yoke portion extending across, and being bent at, the fold, at least one of the prong portions extending at an angle with respect to the surface of the stock through which it passes to form a barb pointing into the space between the end portion and the central portion, said stitch maintaining the end portion in folded back position resisting flattening out of the end portion into the plane of the adjoining central portion under the load of the body.

5. A carrier as set forth in the preceding claim in which the top webs engaged by the handle are provided with apertures adapted to be engaged by the said barbs to resist disengagement of the handle from the webs under downward pressure of the handle.

6. A bottle carrier comprising a carrier body consisting of a sheet of foldable material and including a bottom wall, side walls, a central partition substantially parallel to, and between the side walls, and bottle separating top webs extending substantially at right angles with respect to the side walls, to the partition and to the bottom wall; and a handle consisting of a separate strip of foldable sheet material, said handle including a central hand grip portion flexed substantially in the shape of a U, and an end portion on either end of the central portion, the end portion being folded back upon the central portion to receive one of the webs in the fold between the central portion and the folded back end portion, the end portion and the central portion adjacent the end portions

being bifurcated to straddle the central partition, said handle including provisions for maintaining the end portions in folded back position to resist flattening out of the end portions into the plane of the adjoining central portion.

7. A bottle carrier comprising a carrier body consisting of a sheet of foldable material and including a bottom wall, side walls, a central partition substantially parallel to, and between, the side walls, and bottle separating top webs extending substantially at right angles with respect to the side walls, to the partition, and to the bottom wall; and a handle consisting of a separate strip of foldable sheet material, said handle including a central hand grip portion flexed substantially in the shape of a U, and an end portion on either end of the central portion, the end portion being folded back upon the central portion to receive one of the webs in the fold between the central portion and the folded back end portion, the end portions and the central portion adjacent the end portions being bifurcated to straddle the central partition, and a ply of reinforcing material attached to the handle at each of the folds for maintaining the end portions in folded back position and resisting unbending of the stock at the folds under the weight of the carrier body.

8. A bottle carrier comprising a carrier body consisting of a sheet of foldable material and including a bottom wall, side walls, a central partition substantially parallel to, and between, the side walls, and bottle separating top webs extending substantially at right angles with respect to the side walls, to the partition and to the bottom wall; and a handle consisting of a separate strip of foldable sheet material, said handle including a central hand grip portion flexed substantially in the shape of a U, and an end portion on either end of the central portion, the end portion being folded back upon the central portion to receive one of the webs in the fold between the central portion and the folded back end portion, the end portions and the central portion adjacent the end portions being bifurcated to straddle the central partition, and a metal stitch extending across each of the folds for maintaining the end portions in folded back position, the metal stitch including two prongs and a yoke connecting the two prongs the yoke extending across, and being bent at, the respective fold.

9. A carrier as set forth in the preceding claim in which at least one of the prongs at each end portion of the handle extends at an angle with respect to the surface of the stock through which it passes to form a barb pointing into the space between the end portion and the central portion, said barb being adapted to engage the stock of the respective web to resist disengagement of the handle from the web under downward pressure on the handle.

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