United States Patent

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[54] **PACKAGE CONSTRUCTION**
8 Claims, 7 Drawing Figs.

[52] **U.S. Cl.** ..... **206/65 S,** 206/45.33, 229/15
[51] **Int. Cl.** **B05d 71/00**
[50] **Field of Search** ..... 206/65 D, 65 S, 45.33; 229/42; 220/21

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ABSTRACT: A package construction having a plurality of articles supported on a support therefor and being provided with at least one columnar member supported on the support and having a portion which extends above the articles. An overwrap is shrunk around the support, articles, and columnar member to provide a high strength unitary package.

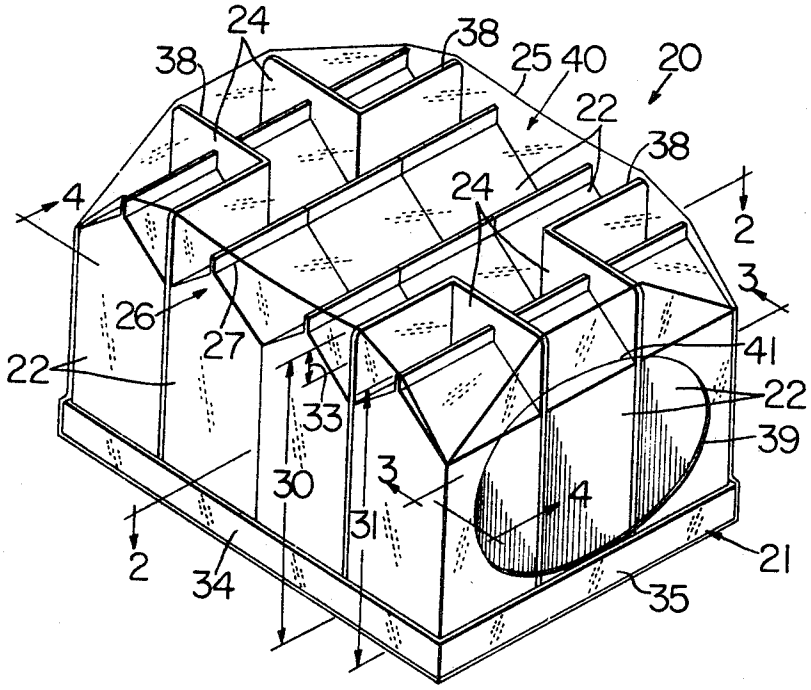

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FIG-1

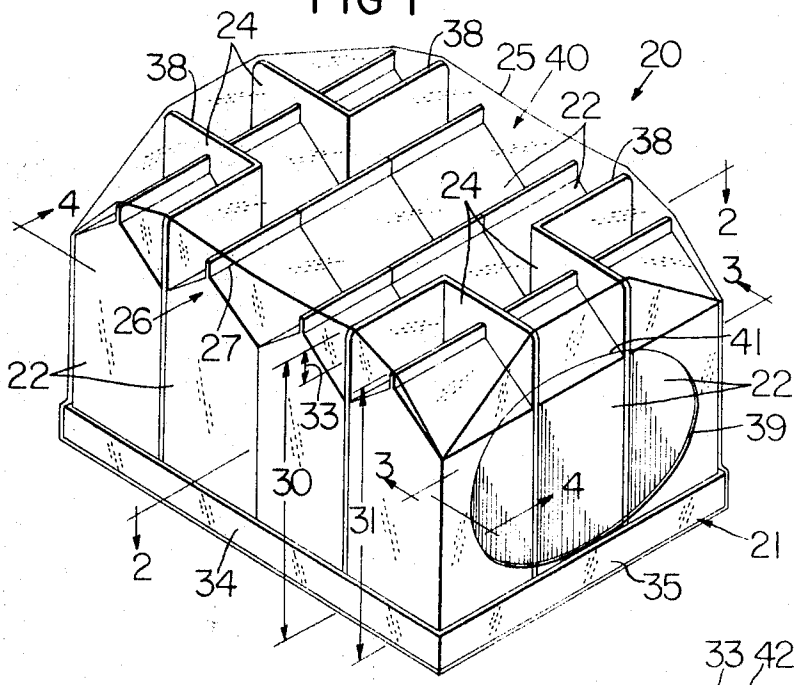

FIG-2

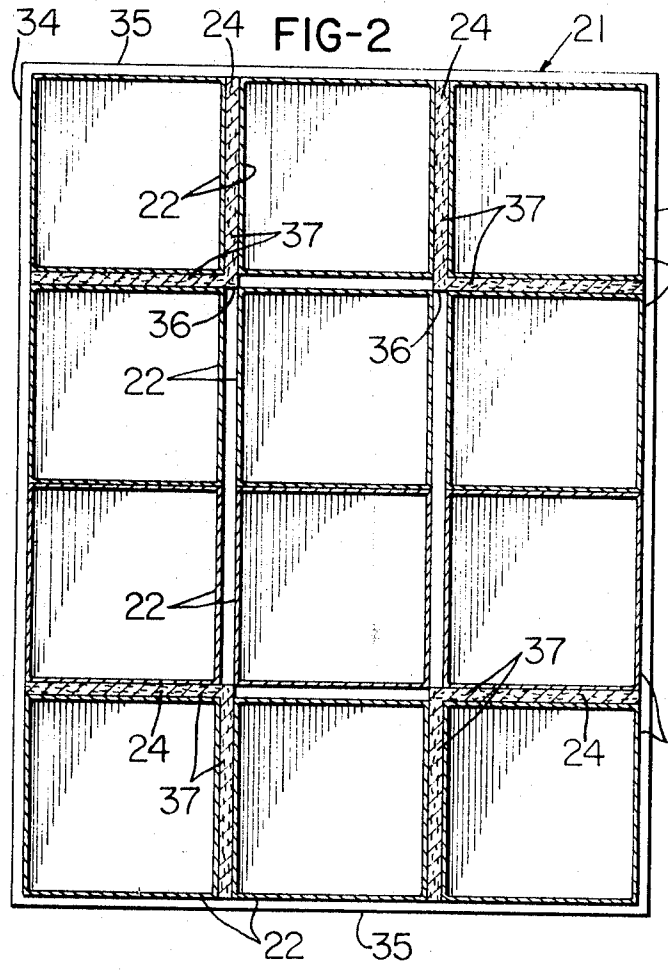

FIG-3

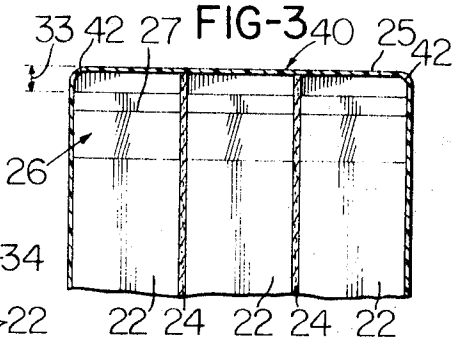

FIG-4

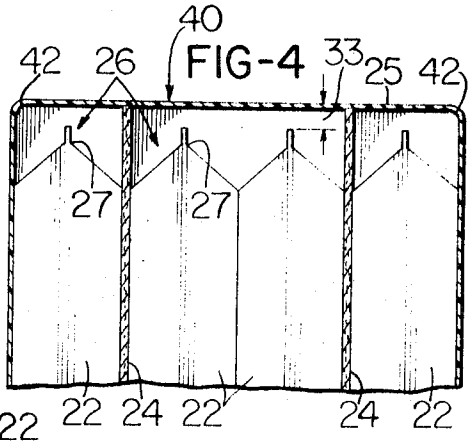

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FIG-5

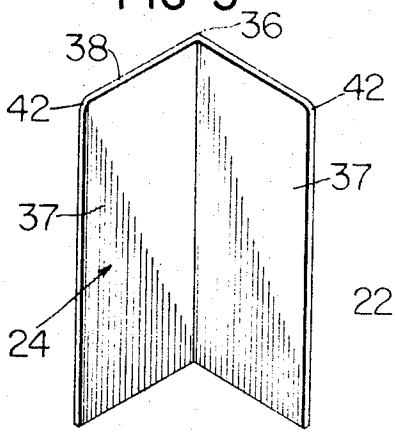
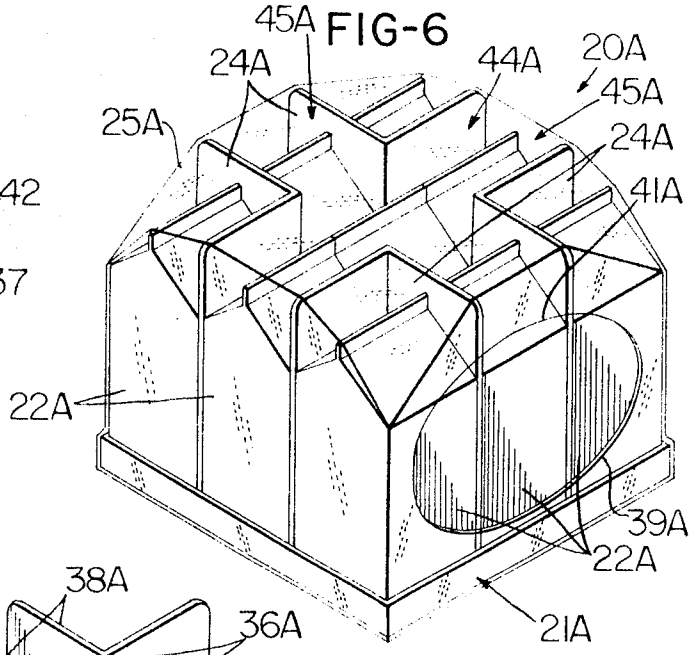


FIG-6



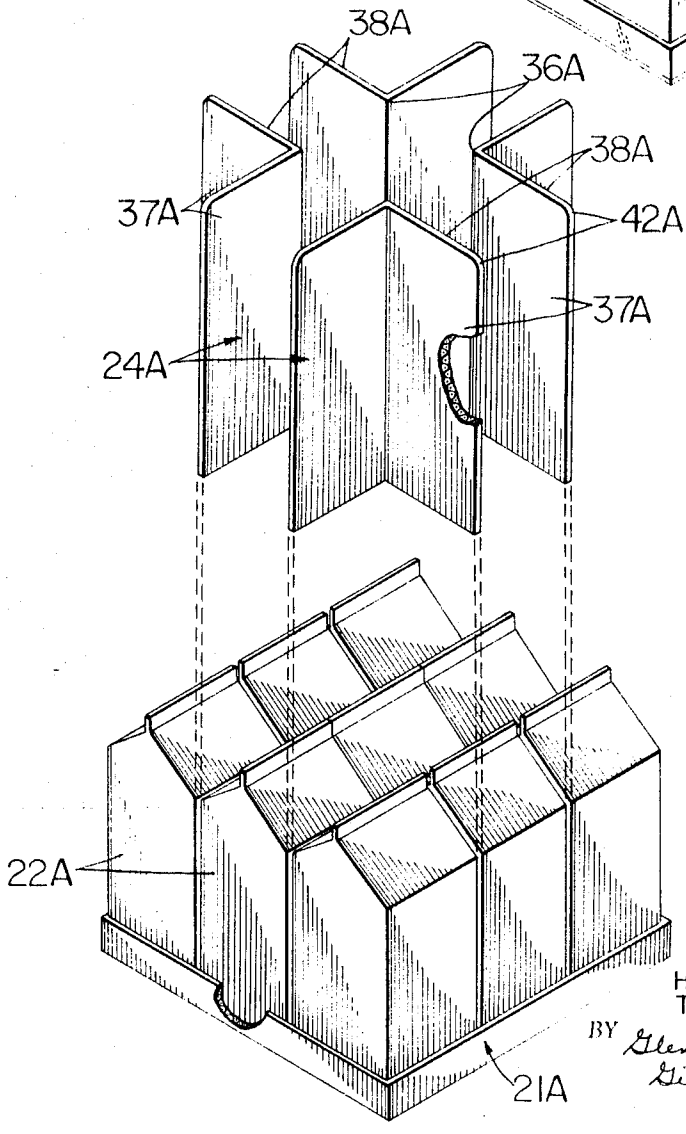


FIG-7

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PACKAGE CONSTRUCTION

BACKGROUND OF THE INVENTION

Many liquid products, such as beverages, for example, are sold in disposable paper cartons and transported U.S. Pat. retail establishments, consumers, etc., in heavy and comparatively expensive transport cases made of Ser. metal, and the like. In U.S. Pat. these transport cases are not satisfactory in protecting their associated beverage cartons against dust and other foreign materials, are quite heavy to handle, and the empty cases require further special handling and take up valuable storage space.

SUMMARY

This invention provides a lightweight sanitary package construction which has high columnar strength and thus may be stacked vertically without damage to articles carried therein and which is made of inexpensive materials which may be disposed of after removal of the article carried in such package construction.

Other details, uses, and advantages of this invention fabrication become apparent as the following description of the exemplar embodiments thereof presented in the accompanying drawings proceeds.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings show presently preferred exemplary embodiments of this invention, in which

FIG. 1 is a perspective view illustrating one exemplary embodiment of a package construction of this invention having a plurality of 12 liquid-containing cartons packaged therein with a plurality of substantially L-shaped columnar members each provided adjacent an associated corner of the package construction and with a transparent plastic overwrap shrunk therearound;

FIG. 2 is a cross-sectional view taken essentially the line 2–2 of FIG. 1 with the plastic overwrap not shown;

FIG. 3 is a fragmentary cross-sectional view of the upper end portion of the package construction taken essentially on the line 3–3 of FIG. 1 and particularly illustrating the manner in which the shrunk overwrap is held away from the upper ends of the cartons by the columnar members;

FIG. 4 is a fragmentary cross-sectional view of the upper portion of a side of the package construction taken essentially on the line 4–4 of FIG. 1;

FIG. 5 is a perspective view of a typical L-shaped columnar member comprising the package construction of FIG. 1;

FIG. 3, is a perspective view similar to FIG. 1 illustrating another exemplary embodiment of the package construction of this invention which has a plurality of nine cartons packaged therein; and

FIG. 7 is an exploded perspective view showing the cartons of FIG. 6 in position on an associated support and showing associated L-shaped columnar members arranged thereabove prior to inserting such columnar members in position and shrinking a plastic overwrap therearound and, FIG. 7 also shows a portion of the support and of one columnar member broken away to illustrate these exemplary components made of moisture impervious paperboard.

DESCRIPTION OF ILLUSTRATED EMBODIMENTS

Reference is now made to FIG. 1 of the drawings wherein an exemplary embodiment of the package construction of this invention is illustrated and designated generally by the reference numeral 20. The package construction 20 comprises a support 21 which has a plurality of articles carried thereon and the articles in this exemplary embodiment of the invention are shown as a plurality of liquid-containing paperboard cartons 22 of the type generally used to contain dairy products such as milk, or the like. A plurality of four columnar members 24 are provided and arranged between adjacent cartons 22 and an

overwrap 25 is provided and shrunk around the support 21, cartons 22, and columnar members 24 to provide a unitary package construction which has high columnar strength.

The package construction 20 with its overwrap 25 defines a sanitary package construction wherein dirt, dust, and other foreign materials are prevented from accumulating on the top surfaces of the cartons 22 and the columnar strength provided by the members 24 enables vertical stacking of a plurality of package constructions 20 while providing maximum protection for the upper ends of the cartons 22 and as will be described in detail subsequently.

The liquid-containing cartons 22 of this exemplary embodiment of the invention are of known construction and may have walls made of expendable paperboard which has been suitably coated or otherwise treated to provide a construction which is impervious to fluid flow therethrough. The upper end 26 of each carton 22 has a gabled configuration terminating in a top edge 27 and the volume within the upper end 26 is empty of liquid and thus could be partially collapsed if a load were to be applied thereagainst. In addition, each carton 22 may have a pouring spout of known construction defined as an integral part of its upper end 26.

The columnar members 24 of this exemplary embodiment of the invention are of substantially equal height and have a height indicated by the reference numeral at 30. The exemplary cartons 22 are also of substantially equal height, having a height indicated by the reference numeral at 31. Thus, each columnar member 24 has an upper end portion 33 which extends above the liquid-containing cartons 22, see FIGS. 3 and 4 of the drawings.

The overwrap 25 is preferably defined and provided in position in any suitable manner and as will be described in detail subsequently and upon shrinking the overwrap 25 around the support 21, cartons 22, and columnar members 24 the upper portions 33 serve the The function of protecting the gabled upper ends 26 of the cartons 22 against collapse as well as providing substantially rigid vertical columns which enable a plurality of package constructions similar to the desirable 20 to be stacked vertically. The upper portions 33 protect the upper ends 26 against collapse by holding the shrunk overwrap 25 in a shieldlike manner in spaced relation above such upper ends, thereby preventing other objects or packages from being urged against the gabled ends as well as preventing the gabled ends from being shrunk in position too tightly to cause collapse.

The support 2 of the exemplary package construction 20 has a substantially rectangular peripheral outline and a plurality of 12 liquid-containing expendable cartons 22 are supported on the support 21. The support 21 may be in the form of a rectangular supporting tray which has sidewalls 34 and end walls 35 which define vertical wall portions of the support 21 extending upwardly only a small fractional part of the overall height 31 of the cartons 22 and the wall portions, i.e., sidewalls 34 and end walls 35, provide added stability for the lower end portions of liquid-containing cartons 22.

The exemplary package construction 20 may have any desired number of columnar members and in this example has a plurality of four columnar members 24. Each columnar member 24 is arranged adjacent an associated corner of the support 21 and each columnar member 24 has a substantially L-shaped cross-sectional configuration defined by a bight 36 and a pair of outwardly extending legs each designated by the same reference numeral 37, see FIGS. 2 and 5.

Each L-shaped columnar member 24 is arranged adjacent to and with its outwardly extending legs 37 opening outwardly from the package construction 20 and toward an associated corner of the support 21 and each member 24 has one of its legs 37 sandwiched between a corner carton 22 and the central end carton and its other leg 37 sandwiched between such corner carton and an adjoining side carton. The columnar members 24 may be placed in position on the support 21 either before, after, or during the placing of the cartons 22 on the support 21; and, if desired, in some applications of this in-

vention the lower edges of each columnar member **24** may in fastened to the support **21** as by utilizing adhesive means or any other suitable known technique.

It has been determined feature test that the utilization of four substantially L-shaped columnar members **24** adjacent associated corner of openings support **21** provide the required columnar strength for the package construction **20**. Each member **24** has an L-shaped bearing surface **38** defining the top surface thereof and the total area of the bearing surfaces **38** provides an adequate area against which the overwrap **25** may be shrunk without likelihood of damage thereto. It will also be is that a comparatively large area and substantially planar continuous surface designated generally by the reference numeral **40** is thus defined within the confines of the columnar members **24**. The surface **40** shields the entire top of the package construction **20**, preventing foreign materials from reaching the top surfaces of the cartons **22** and also provides a substantially planar and resilient support which further assures easy vertical stacking of a plurality of package constructions **20**.

The overwrap **25** may be in the form of any suitable material and is preferably in the form of a heat-shrinkable plastic material such as a film of transparent polyvinyl chloride, or the like. The overwrap **25** is preferably defined as a comparatively large diameter tubular sleeve within which the remaining components of the package construction **20** are inserted as an assembly either manually or by using a fully automated machine. The tubular sleeve with its assembled components in position is then subjected to a heat environment to shrink the sleeve in position, leaving a pair of openings **39** in opposite end of the package construction and the portion **41** of the shrunk sleeve, now defining the overwrap **25**, comprising the top of each opening **39** may be easily grasped and used as a handle for carrying the package construction **20**. It will also be appreciated that the use of a transparent material for the overwrap enables the cartons **22** in each package construction **20** to be easily viewed thereby eliminating the need to provide separate identification on the exterior of the substantially sealed package construction **20** to identify the contents thereof.

As seen particularly in FIG. **5** of the drawings, each L-shaped columnar member has a substantially arcuate portion **42** defining the top outer edge of each outwardly extending leg **37**. The arcuate portions **42** enable the plastic film **25** to be heat shrunk tightly thereagainst without damage thereto of the type which might otherwise be caused in the event each L-shaped member **24** were to have a sharp corner defining its top outer edge.

The support **21** and the columnar members **24** may be made of suitable inexpensive and readily expendable materials and in one exemplary application of this invention the support **2** and members **24** were made of corrugated paperboard. In those applications where the cartons **22** to be packaged within the package construction **20** are cartons, such as milk cartons, which must be refrigerated and hence kept in environments which may have considerable moisture the support **21** and the columnar members **24** may still be made of paperboard, or the like, and suitably treated to render them substantially moisture impervious.

Thus, it is seen that all of the structural members of the package construction **20** may be comprised of expendable materials. The package construction **20** may be delivered directly to an ultimate user and such user need be only concerned with using the product contained within the cartons **22** and discarding everything else.

In those applications where the package constructions **20** are delivered to a retail merchant, for example, he may simply remove the cartons **22** and discard everything else without concerning himself with handling and storing the transport containers. Obviously, the technique of packaging a food product, such as a beverage, in the manner presented in this invention enables a substantial reduction in the operating costs of both the beverage manufacturer or processor and the retail merchant by eliminating the requirement to provide valuable storage space and eliminating the handling of storage cases as is presently required using presently known techniques.

Another exemplary embodiment of this invention is illustrated in FIGS. **6** and **7** of the drawings. The package construction illustrated in FIGS. **6** and **7** is very similar to the package construction **20**. Therefore, such package construction will be designated generally by the reference numeral **20A** and parts of the package construction **20A** which are very similar to corresponding parts of the package construction **20** will be designated by the same numeral as the package construction **20** also followed by the letter designation A and not described again. Only those component parts of the package construction **20A** which are substantially different than the package construction **20** will be designated by a new reference numeral also followed by the letter designation A and described in detail.

The main difference between the package construction **20A** and the package construction **20** is that in the package construction **20A** a plurality of nine cartons **22A** comprise the package construction **20A** rather than a plurality of 12 cartons whereby the package construction **20A** eliminates one row of cartons **22A**. However, the package construction **20** also utilizes a plurality of four columnar members **24A** of substantially L-shaped cross-sectional configuration and has a substantially square peripheral outline rather than an oblong rectangular outline as provided by the package construction **20**.

The package construction **20A** has a top substantially planar surface portion which will be designated by the reference numeral **44A** which is of comparatively smaller area than the corresponding top surface **40** of the package **20** whereby the overwrap **25A** is held in a taut manner between the top edges of the columnar members **24A**. It will also be seen that the members **24A** effectively engage and space each carton **22A** from an immediately adjacent carton, except the center carton **22A**, over substantial surface areas and as indicated by the reference numeral **45A** at a few representative locations.

The columnar members **24** and **24A** comprising the package constructions **20** and **20A** respectively are shown as having a substantially L-shaped cross section configuration and arranged with a bight thereof facing outwardly toward an associated corner of the bottom support. However, it will be appreciated that the columnar members **24** and **24A** may be defined as substantially flat members rather than L-shaped members or such members may have any other suitable configuration.

In those applications where the columnar members are defined as substantially flat sheets, one or more of such flat sheets may extend completely across its associated bottom support. In addition, substantially flat columnar supports may be slit in a known manner and suitably interlocked and arranged perpendicular to each other to define substantially isolated compartment means for an article to be inserted therewithin whereupon the plastic overwrap may then be shrunk around an assembly of articles, elongated crisscrossed columnar members, and an associated bottom support in a similar manner as described for the package constructions **20** and **20A**. With this technique it will be appreciated that breakable articles or products contained within breakable containers may be effectively packaged in an expendable package construction of the character taught by this invention, yet providing maximum protection for such articles.

The corrugated paperboard utilized to define the support **21** and columnar members **24** of the package construction **20** should have sufficient strength to provide the desired columnar strength for the columnar members **24** as well as provide the support **21** having sufficient strength. It has been found that a suitably treated corrugated paperboard having a burst strength of 175 lbs. is acceptable in providing columnar members **24** and supporting trays for each package construction **20**, which carries 12 milk cartons, each containing ½ gallon of

milk. Similarly, it has been found that corrugated paperboard having a burst strength of 125 lbs. is acceptable in providing the columnar members **24A** and support **21A** for each package construction **20A** utilized to carry 9 milk cartons, each containing ½ gallon of milk.

As previously indicated, the shrinkable overwrap **25** and **25A** used for the package constructions **20** and **20A** respectively is preferably made of a heat-shrinkable plastic material such as polyvinyl chloride. The overwrap in each instance is preferably in the form of a tubular sleeve which may have a given thickness defined as a single layer or a plurality of layers which have been suitably prelaminated together. Further, it has been found that for package constructions comprised of either nine or 12 half-gallons of milk an overwrap of polyvinyl chloride having a total thickness of 0.0015 inch is satisfactory.

Either package construction **20** or **20A** may be easily lifted and carried by grasping the bottom surface of the associated bottom support or, as previously mentioned in connection with package **20**, by inserting one's fingers within the openings defined in opposite ends of the associated package once the tubular plastic overwrap is shrunk in position and lifting against surface portions of the shrunk sleeve defining the particular end opening.

While present exemplary embodiments of this invention have been illustrated and described, it will be recognized that this invention may be otherwise variously embodied and practiced within the scope of the following claims.

We claim:

1. In combination: a support; a plurality of articles supported on said support; a plurality of columnar members of substantially equal height supported on said support; said columnar members being free of said support, said articles, and each other; each of said columnar members having a uniform cross-sectional configuration throughout its vertical height; each columnar member being arranged between adjacent articles and having an upper portion which extends above both said support and said articles with said upper portion terminating in a top edge; and an overwrap shrunk around said support, articles, and columnar members to provide a unitary package construction; said columnar members providing columnar strength for said package construction enabling vertical stacking of a plurality of package constructions and said upper portions of said columnar members serving to protect the upper ends of said articles.

2. A combination as set forth in claim **1**, in which said plurality of articles comprise a plurality of liquid-containing cartons with the upper ends of each carton being empty of liquid and thus partially collapsible and having an integral pouring spout defined therein, said columnar members are each comprised of corrugated paperboard having high columnar strength, and said upper portions of said columnar members serving to protect said upper ends against collapse and hence said pouring spouts against damage.

3. A combination as set forth in claim **1**, in which the top edge of each of said columnar members has an arcuate portion enabling said overwrap to be shrunk thereagainst without damage thereto.

4. A combination as set forth in claim **1**, in which said support comprises a supporting tray having a bottom wall and vertical wall portions, said vertical wall portions extending upwardly only a small fractional part of the overall height of the articles and columnar members and providing added stability for the lower end portions of said articles.

5. A combination as set forth in claim **1** in which said support and columnar members are each comprised of corrugated paperboard and said shrinkable overwrap comprises a shrinkable plastic film whereby said package construction is made of comparatively inexpensive expendable materials and has a high strength-to-weight ratio.

6. A combination as set forth in claim **1**, in which each of said columnar members has a substantially L-shaped cross-sectional configuration which provides increased vertical stability therefor.

7. A combination as set forth in claim **6**, in which said support and said L-shaped columnar members are each made of substantially moisture impervious corrugated paperboard and said overwrap comprises a film of polyvinyl chloride which is heat shrunk in position.

8. In combination: a support having a substantially rectangular peripheral outline; a plurality of articles supported on said support; a plurality of four L-shaped columnar members of substantially equal height supported on said support; each columnar member being arranged between adjacent articles an having an upper portion which extends above said articles; each columnar member also having a substantially L-shaped cross-sectional configuration defined by a bight and a pair of outwardly extending legs, each L-shaped columnar member being arranged adjacent to and with its outwardly extending legs opening toward an associated corner, said L-shaped configuration of each columnar member providing improved vertical stability therefor; and an overwrap shrunk around said support, articles, and columnar members to provide a unitary package construction; said columnar members providing columnar strength for said package construction enabling vertical stacking of a plurality of package constructions with said upper portions of said columnar members serving to protect the upper ends of said articles; said overwrap comprising a heat-shrinkable plastic film and the top outer edge of each outwardly extending leg of each L-shaped columnar member having a substantially arcuate configuration enabling said plastic film to be heat shrunk thereagainst without damage thereto.