Jan. 17, 1967 C. B. SCHERTZ 3,298,511

PACKAGING AND SHIPPING CONTAINER

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FIG. 1.

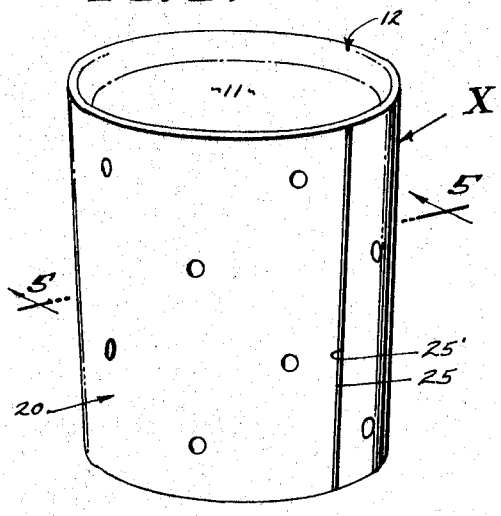


FIG. 2.

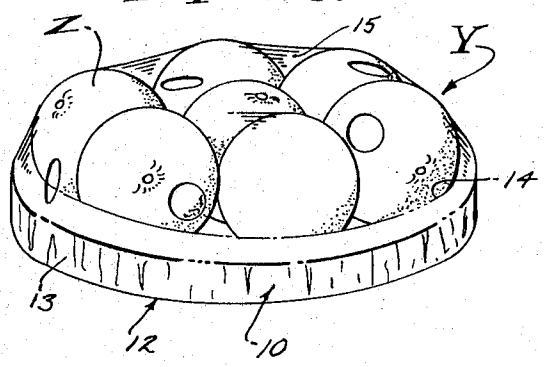


FIG. 3.

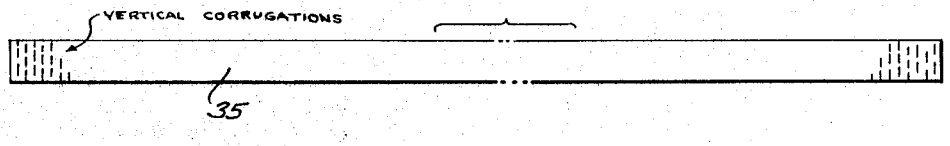
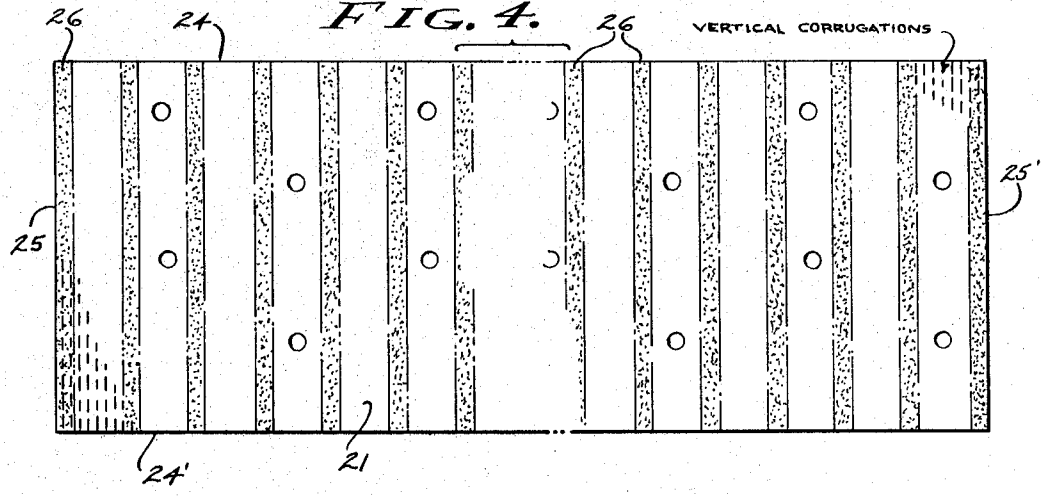


FIG. 4.



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PACKAGING AND SHIPPING CONTAINER

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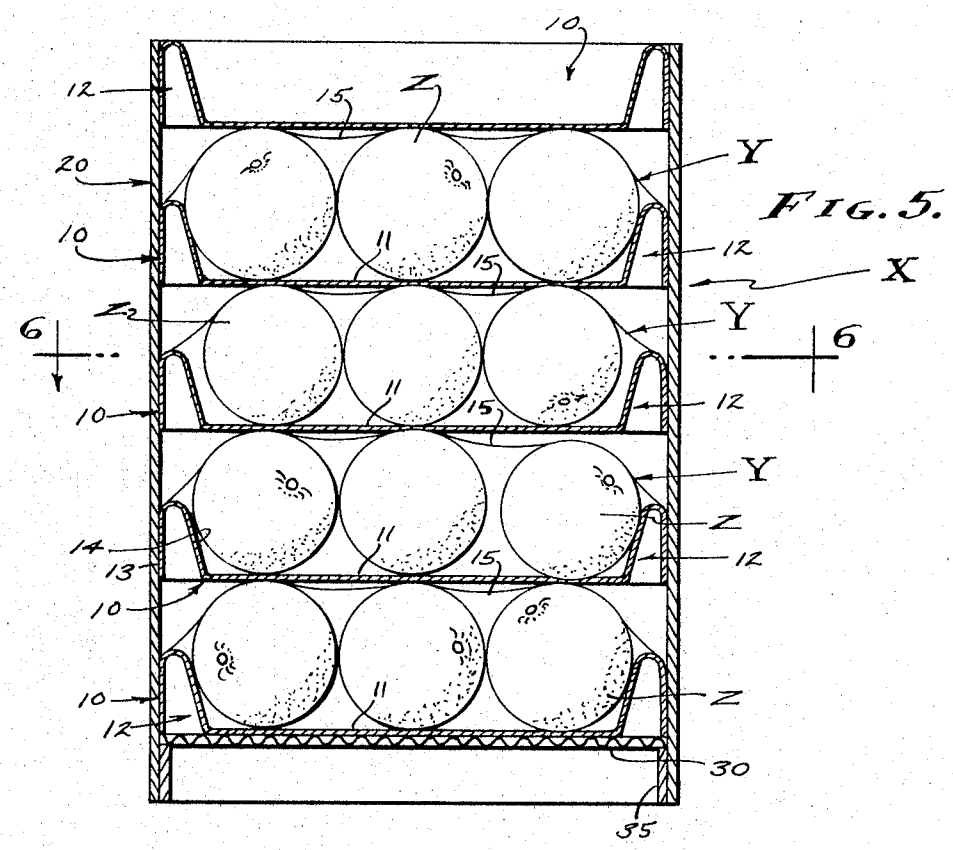
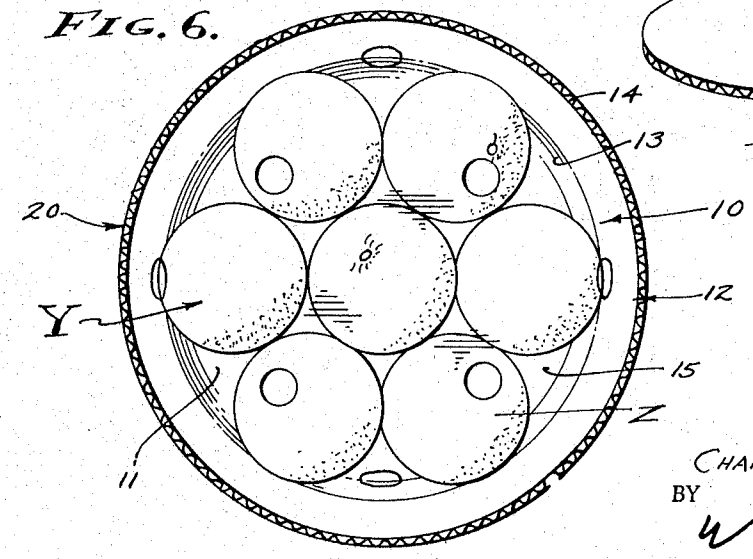


FIG. 5.

FIG. 6.



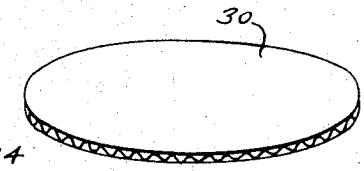


FIG. 7.

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FIG. 8.

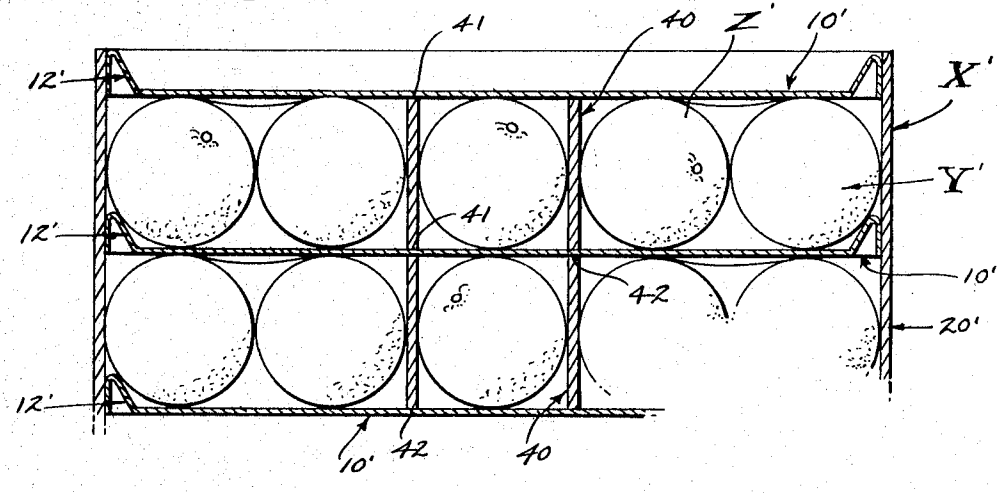


FIG. 9.

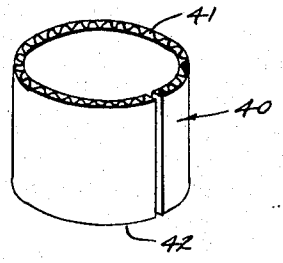
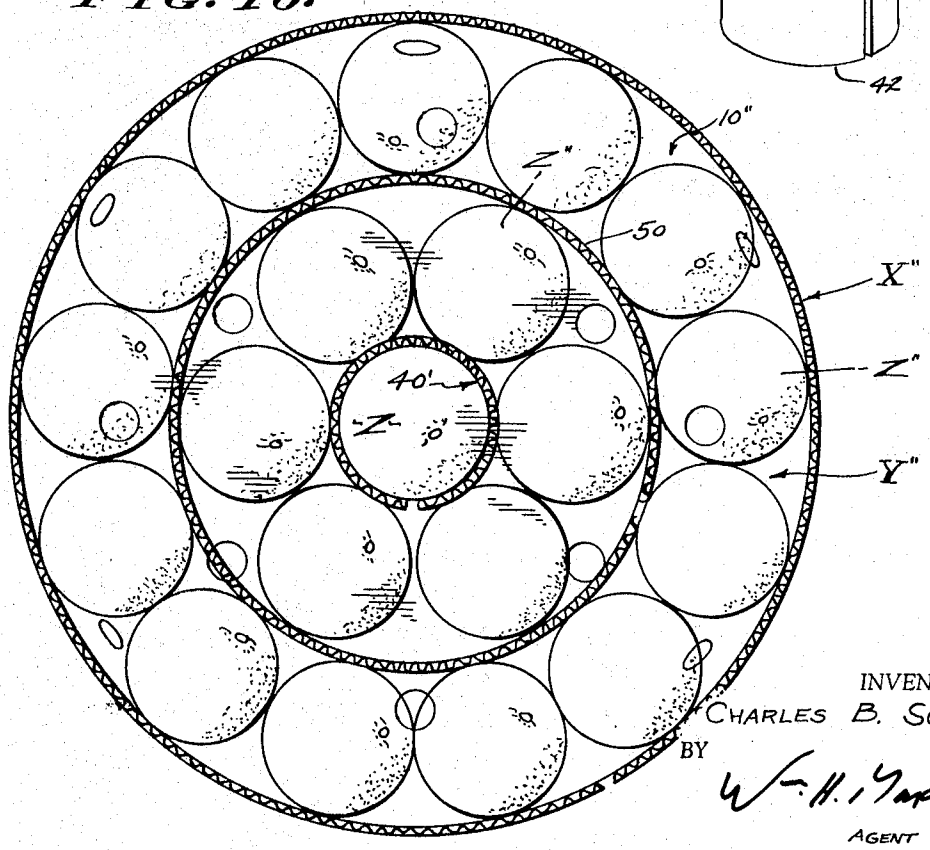


FIG. 10.



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PACKAGING AND SHIPPING CONTAINER

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Filed Nov. 26, 1963, Ser. No. 326,023
6 Claims. (Cl. 206—65)

This invention relates to the packaging of articles and particularly for transporting the same with safety, while simultaneously enclosing numbers of said articles in units or packages that are presentable for sale at their destination.

The present invention has utility in packaging of a wide variety of articles and is particularly adaptable to the packaging and transporting of produce as merchandise to be distributed to retailers for purchase by consumers. Specifically, for example, citrus fruit is picked from the tree in a ripened condition, cleansed and sorted as to size and quality, after which it must be transported to the retailer and/or consumer. Heretofore, the retailer has purchased this type of produce in bulk from the source and must rehandle the same in order to present it for sale as a merchandisable item. Therefore, it has been customary to transport produce in various types of crates which are essentially boxes of slatted design. Needless to say, produce which is simply dumped into and pressed within a box is subject to damage, especially to the produce located at the sides of the box. As a result it is not uncommon for the consumer to be forced to accept produce that has been flattened and/or bruised, and also objectionably picked over by other consumers in search for the more perfect product.

Another aspect of the present invention has to do with enhancement of the appearance of the produce as merchandise, taking advantage of economical conditions that exist at the source of the produce. Grower of produce, such as citrus, must maintain an operation for the proper picking, cleaning and sorting of said produce, and the present invention capitalizes upon the availability of these facilities in order to package the citrus in an attractive and sanitary unit. Generally, the objective of this invention is to eliminate rehandling the produce, to prevent damage to the produce, to reduce waste of materials in packaging the produce, and to enhance the appearance of the produce in order to stimulate merchandising.

An object of this invention is to provide a shipping container suitable for transporting multiple package units of articles which are processed at their source and are not rehandled until purchased by the consumer.

Another object of this invention is to provide a shipping container which combines, structurally, packages that involve trays that form partitions in the shipping container, and a shell that involves a tubular enclosure for the support of said trays and for the protection of the articles contained on said trays.

Another object of this invention is to provide a shipping container that cooperatively relates package units with a protective shell which supports a multiplicity of said units and which shell is expendable. With the present invention the said expendable shell is stripped from the packages in order to expose the said packages as merchandise.

It is still another object of this invention to provide a shipping container and packaging of the character referred to wherein compactness is maintained together with the provision of suitable clearances for prevention of damage, wherein ventilation is easily provided when circumstances require, and wherein pressure of the packing is controllable and is maintained so as to prevent crushing of the individual packages and/or articles contained therein.

The various objects and features of this invention will be fully understood from the following detailed description of the typical preferred forms and applications thereof, throughout which description reference is made to the accompanying drawings, in which:

FIG. 1 is a perspective view of a typical embodiment of the present invention, showing a completed shipping container. FIG. 2 is an enlarged perspective view of a typical package of articles which is combined with the structure of FIG. 1 to form a completed container.

FIGS. 3, 4 and 7 are views of the separate parts that are used in the combination which forms a completed container, FIG. 3 showing a reinforcing strip that is used at the end or ends of the container, FIG. 4 showing the sheet which forms the enclosing and supporting shell of the container, and FIG. 7 showing a disc which is used as a partition or an end of the container.

FIG. 5 is a vertical sectional view taken as indicated by line **5—5** on FIG. 1, and FIG. 6 is a transverse section taken as indicated by line **6—6** on FIG. 5.

FIG. 8 illustrates a second form of the invention that includes a central columnar support, and FIG. 9 is a perspective view of the central column elements shown in FIG. 8.

FIG. 10 illustrates a third form of the invention that includes a multiplicity of separator and columnar support elements.

In the drawings I have shown a typical embodiment of the present invention wherein the shipping container X is made up of a multiplicity of packages Y containing articles Z in the form of produce, such as for example citrus fruit. The fruit can be of uniform size or of random sizes and is cleaned and inspected and in proper condition for purchase by the consumer, all of this being accomplished at the source of said fruit. The packages Y are alike and each contains a number of articles carried on a tray **10** and preferably confined to said tray. The container X comprises the combination of said packages Y and a shell **20** which wraps around the trays to engage and support the same and also to protect the trays and contents thereof. In accordance with the invention the shell **20** is adhered to the trays Y by a releasable adhesive preferably a pressure contact cement that is applicable to one or more of said parts involved, prior to the assembly of said parts as will be hereinafter described.

The container X includes two or more, or a plurality of, packages Y that are alike. The cross-sectional configuration of the said container can vary and it is characteristically tubular, being shown as round and of cylindrical form. Therefore, the packages Y are shown as being of round configuration and such as to occupy the cross-sectional configuration of the said container X. In accordance with the invention the package involves primarily the tray **10** which is a horizontally disposed element upon which the articles Z are carried. In the case under consideration the articles Z are round and of substantially the same size. Thus, the articles can be placed together in touching engagement one with the other, and a suitable number thereof arranged on a tray **10**. It is to be understood that the number of articles to be packaged can vary, as circumstances require.

The tray **10** is shown as a flat horizontally disposed element having a bottom **11** and a peripheral flange **12**. The tray can be constructed in various ways and of various materials, and for example it is preferred that the tray **10** be molded or pressed papier mache. A primary function of the tray **10** is to provide a support for carrying the articles Z and a secondary function thereof is to provide formers or bulkheads when said trays are incorporated in the container X. An adidtional function of the tray **10**, in its first form of the invention, is to

maintain a separation between the articles Z and the shell 20.

In its preferred form, the tray 10 has a flat disc-shaped bottom 11 and the flange 12 projects vertically from the periphery of said bottom. The flange 12 is of substantial vertical extent and presents an outer wall 13 for engagement with the shell 20, said wall being normal to the plane of the bottom 11. Further, the flange 12 has an inner wall 14, spaced radially inward from the outer wall 13 and which is engageable with the articles Z to limit radial displacement thereof. In the first form of the invention, the flange 12 is about half the diameter of the articles Z, which is adequate to limit movement or displacement of said articles. The said bottom 11, and walls 13 and 14 are formed integrally so as to continue one into the other, as shown.

In order to secure the tray 10 and articles Z into a unit or package Y, a cover 15 is placed over the articles Z and fastened to the tray 10. As is illustrated, the cover 15 is a film of transparent material that is stretched over the articles Z and over the peripheral flange 12, and which is then tucked under the tray 10 where it is fastened to the tray. There is a wide variety of cover materials which may be employed for this purpose and it is preferred to use a clear transparent film that will shrink upon the application of heat thereto. Since citrus fruit requires ventilation, the cover 15 is also suitably perforated in order to permit adequate air circulation, and the said cover 15 is either fastened in place by means of a cement or adhesive, or by means of the application of heat, all as may be required.

With the packages Y established as above described, they are arranged one over the other in columnar formation for supported engagement one upon the other. In the particular illustration, FIGS. 1 through 7, the container is of relatively small size, in which case the weight of the citrus, as shown, provides adequate packing engagement. Thus, gravity establishes normal pressure contact from package to package, the flanges 12 of the multiplicity of packages being arranged concentrically one over the other in substantially equally spaced relationship. However, said exact spacing can vary indiscriminately depending upon the variations in sizes of articles Z contained in said packages.

In accordance with the invention I provide the shell 20 that is wrapped onto the packages Y arranged as above described in order to fix the position of the variously placed packages and to thereby establish the container X. As is shown, the shell 20 is made from a sheet 21 or roll of construction material such as, for example, paper. In practice, the shell is made of corrugated paper that is substantially rigid in one plane and readily bendable in the other plane normal to the first mentioned plane. Thus, and in accordance with the invention, the corrugated cross-section of the shell 20 is utilized to best advantage for its columnar strength, said corrugations being disposed transversely of the sheet 21 and so as to be disposed vertically of the trays 10 when wrapped onto the packages Y.

The sheet 21 is a rectangular sheet of corrugated paper that has perforations cut therethrough for ventilation. The corrugations are placed so as to occur between the packages Y, and therefore occur in rows that extend longitudinally of the sheet 21. Since the packages Y are disposed in parallel planes, the top and bottom edges 24 and 24' are straight and parallel. Also, it is preferred that the joinder or abutment of the ends of the sheet 21 be perpendicular, in which case the opposite ends 25 and 25' are normal to the said edges thereof.

In accordance with the invention the sheet 21 is wrapped onto the packages Y to both enclose and support the same, and whereby the packages establish the tubular character of the shell 20. A means of securement is provided to fasten the sheet 21 in place on the arranged packages, for example fasteners can mechanically join the sheet 21 in place. However, a cement or adhesive is preferably used for this purpose, and preferably a pressure contact adhesive which is applicable to one or more of the elements involved. For example, the adhesive is applied to the sheet 21 while it is in flat formation, said adhesive being deposited in bands 26 extending transversely of the sheet. Said bands 26 are disposed at intervals and in generous enough number and width in order to provide adequate fastening. Thus, the bands 26 accommodate vertical differential in placement of said packages Y.

The sheet 21, as above described, is wrapped onto the packages Y as they are arranged as above described and with the bands 26 engaging the outer walls 13 of the respective package trays 10. By the application of suitable pressure the sheet 21 is attached to the packages Y, in the form of the tubular shell 20, which may later be stripped from the packages at will. In order to facilitate release of the shell 20 from the packages, a coating is applied so as to underlie the adhesive on either the shell or the trays of the packages. Said coating is such as to prevent such a tight bond with the paper as would tear and/or rip said paper when the shell is stripped. Such a coating is lacquer or the like, applied to the packages Y and which provides a glaze from which the adhesive will readily peel. It is preferred that the adhesive remain permanently on the sheet 21.

In order to enclose the container X and in order to reinforce the same, an additional tray 10 or disc 30 is applied at the ends of the container. For purpose of illustration, I have shown a tray 10 at the top of the container and a disc 30 at the bottom thereof. The element 10 and/or 30 functions to close the container ends and to reinforce the same, being secured in place by the adhesive bands hereinabove described. Further, the lowermost rim of the container can be substantially reinforced by the inner wrapping of a strip 35 of corrugated paper with vertically disposed corrugations that engage under the disc 30 to support the same. Again, the strip 35 is secured in place by the adhesive bands as above described.

In FIGS. 8 and 9 of the drawings I have shown a second form of the invention and which involves each of the essentials above described in connection with the first form. That is, the said second form involves a container X' made up of a multiplicity of packages Y' containing articles Z'. However, in this instance the cross-sectional area of the trays and/or container is materially increased, and also the depth (not shown) can be increased, in which case the increased weight involved must be adequately supported. Therefore, one or more interior columns 40 is provided and which functions to properly space the packages Y'. As is shown, the column 40 is centrally positioned, it being understood that several or more of such columns can be advantageously positioned, as circumstances require, to distribute weight and to space the trays 10' of the packages Y'.

The column 40 now under consideration is shown by itself in FIG. 9 and involves vertically disposed walls with top and bottom edges 41 and 42 spaced a distance substantially the same as the diameter or height of the article Z'. In practice, the column 40 is a length of corrugated paper with vertically disposed corrugations that engage underlying and overlying trays 10', permitting said trays to firmly touch the respective bottoms and tops of the articles Z'. Thus, a controlled pressure contact is established regardless of the number of packages stacked or arranged one upon the other. The column 40 can vary widely in cross-section, for example, it can be X-shaped, but as shown it is preferably tubular and such as to encircle a centrally placed article. Therefore, the columns 40 are retained at the center of the packages in substantial alignment one with the other.

Further, the second form of the invention is modified somewhat with respect to the trays 10', the flange 12' being formed so as to position the article Z' to touch

adjacently against the shell **20'**. In this form of the invention the height of the flange **12'** is reduced somewhat and engages tangentially with the spherical article Z' while said article simultaneously touches the shell **20'** with some pressured engagement.

Referring now to FIG. 10 and the third form of the invention the same essentials are involved, namely the container X'' is made up of a multiplicity of packages Y'' containing articles Z''. The relationship of these essentials remains the same; however, the increased area and weight requires additional partitioning and columnar support. Again, columns **40'** and **50** are provided and which function to properly place the packages Y'' and also to separate rows of articles Z''. The column **40'** is the same as column **40** above described, being placed at the center of the tray **10''**. In this instance, the column **50** is shown as a circular vertically disposed wall that encompasses the first mentioned columnar wall **40'**, with top and bottom edges spaced a distance substantially the same as the diameter or height of the articles Z''. Like the column **40'**, the column **50** has vertically disposed corrugations which determine the extent to which the articles Z'' are depressed.

From the foregoing, it will be apparent that with each form of the invention the packages are provided with articles in place thereon, said articles being arranged in snug engagement within the flange of the tray and so that lateral movement cannot occur. By application of the cover to the tray an attractive unit is produced and which must be transported to the retailer and/or consumer. In accordance with the invention, the packages (X, X' and/or X'') are arranged in supported engagement one over the other with compression of the articles controlled (by gravity in the first form and by columnar spacers in the second and third forms). Finally, by the application of the shell engaged onto the prearranged packages, and by securement of the shell in working position there is a fixation of position whereby all packages comprising the container are positioned one relative to the other for the duration of the container life. Only upon stripping of the shell from the said packages are said packages released as individual items of merchandise.

Having described typical preferred forms and applications of my invention, I do not wish to be limited or restricted to the specific details herein set forth, but wish to reserve to myself any modifications or variations that may appear to those skilled in the art and fall within the scope of the following claims.

Having described my invention, I claim:

1. In combination, a multiplicity of like packages and each package comprising a tray having a peripheral flange formed of a double wall construction providing substantially vertically disposed and radially spaced outer and inner walls and with articles carried on the tray and confined thereto by said inner wall of said flange, said packages being arranged one over the other in columnar relationship, a vertically disposed support engaging shell comprising a sheet of material having columnar strength and bendable horizontally while remaining vertically rigid, adhesive securing means between said sheet and said vertically disposed outer walls of said flanges, said sheet being wrapped onto said prearranged packages and secured thereto by said adhesive means to the outer walls of said peripheral flanges, whereby said multiplicity of packages are enclosed and each is fixedly supported by said shell so as to relieve the columnar load of said prearranged relationship.

2. The subject-matter of claim **1**, wherein the said outer wall of the flange of each tray is disposed substantially normal to the plane of said tray.

3. The subject-matter of claim **1**, wherein said fastening means comprises an adhesive applied to the inner face of said sheet to oppose the vertically disposed outer wall of said flange.

4. The subject-matter of claim **3**, wherein the outer wall is provided with a glaze coating to facilitate the release of said shell from said flanges when unpacking the container.

5. The subject-matter of claim **1**, wherein said flange of each tray is formed with a peripheral edge portion which extends first upwardly from the tray to constitute said inner wall of said flange and then is provided with a return bend portion terminating in a downwardly disposed skirt portion, the last-mentioned portion extending substantially normal to the plane of said tray and constituting said outer wall of said flange, said two walls being thus radially spaced from each other.

6. The subject-matter of claim **5**, wherein said inner wall is angularly disposed with reference to said outer wall to properly confine and cushion the articles carried by said tray.

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