United States Patent [19]

Jean

[11] 3,872,969

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[54] COLLAPSIBLE SELF-STORING SHIPPING CARTON

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[21] Appl. No.: **414,226**

[52] U.S. Cl. ..... **206/303**, 206/320, 206/493, 206/499, 229/14 C, 229/41 R

[51] Int. Cl. **B65d 5/36**, B65d 5/50, B65d 85/02

[58] Field of Search ..... 206/303, 320, 372, 386, 206/493, 499; 229/23 R, 41 R, 14 C

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[57] ABSTRACT

A collapsible self-storing shipping carton for packaging a plurality of ringlike elements. The carton contains a plurality of packaging assemblies, each of which mounts and supports a number of the ringlike elements. Each package assembly includes two spaced support panels between which extends core members. The ringlike elements are mounted around the core elements which are collapsible for return. An upper and a lower closure member, nestable or telescopically receivable within each other, is placed over the package assemblies. The height of the support panels are less than the width of the closure members so that the panel members may be disassembled from the core elements and laid within one of the closure members for return. With the carton components disassembled and in the collapsed condition, the outside dimensions of the knocked down carton is no larger than the width and length of the larger of the upper and lower closure members. The carton is designed to have a minimum number of parts or components and adapted to be returned and reused.

4 Claims, 5 Drawing Figures

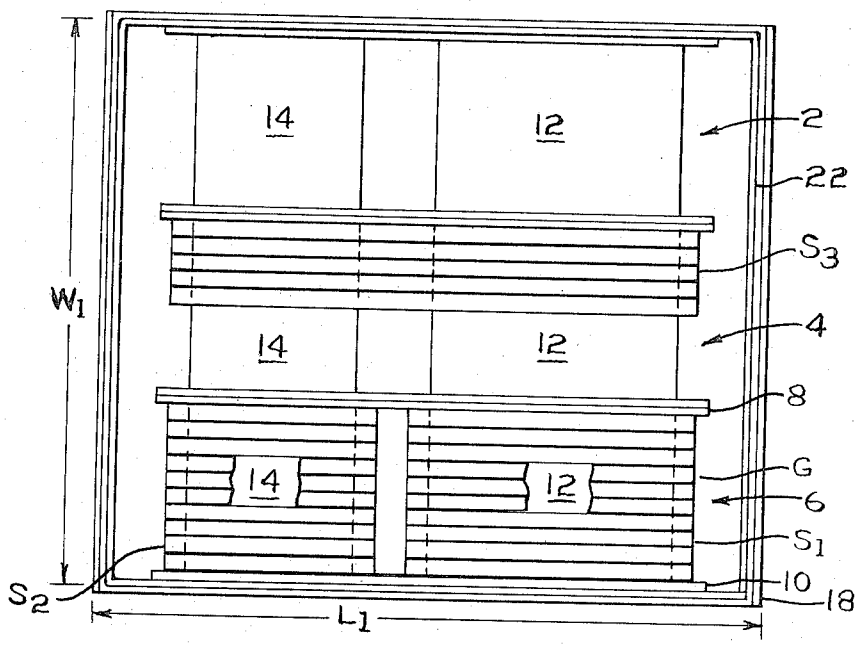
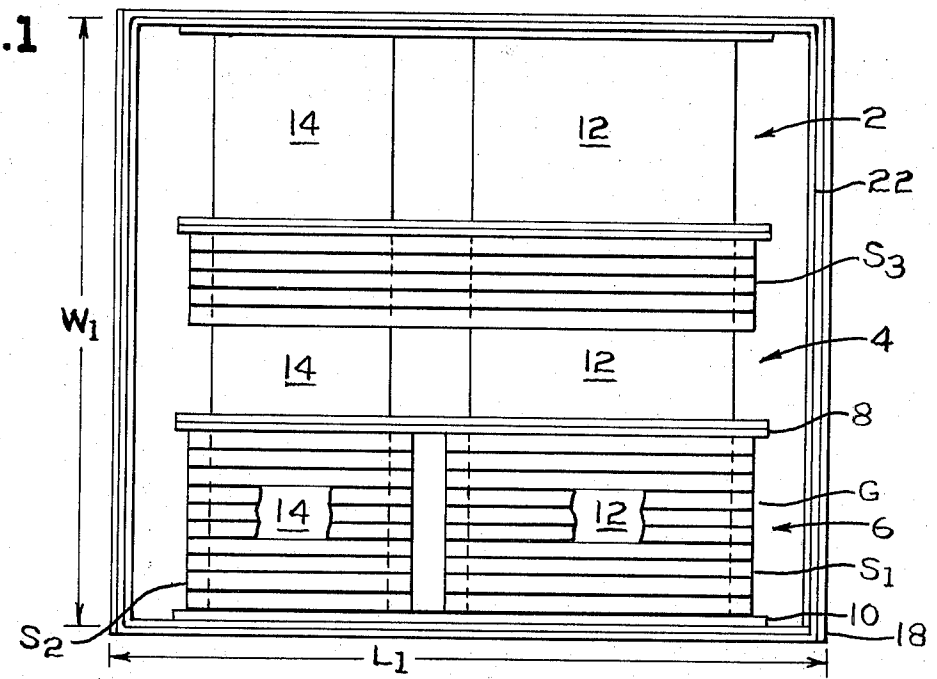


FIG. 1



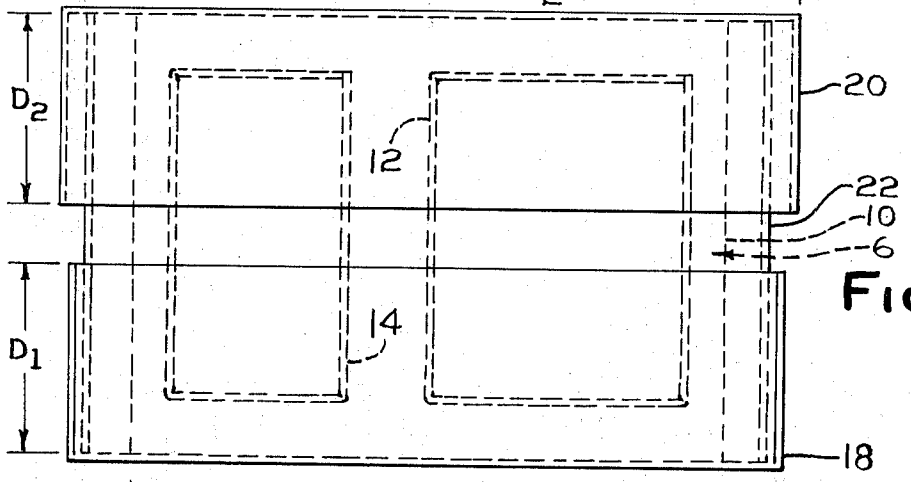


FIG. 2

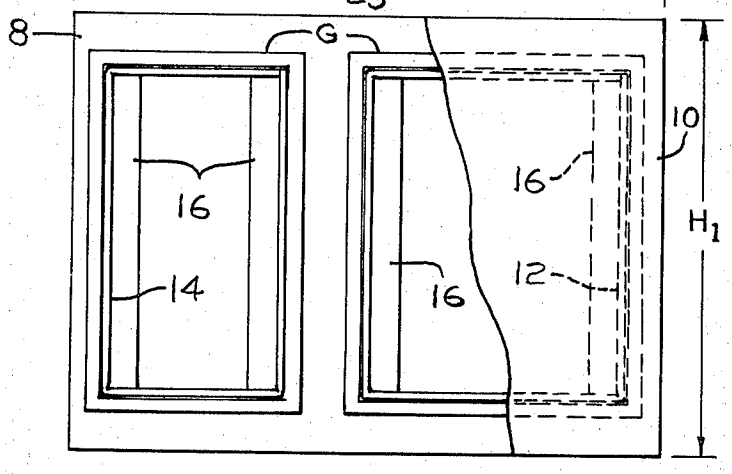


FIG. 3

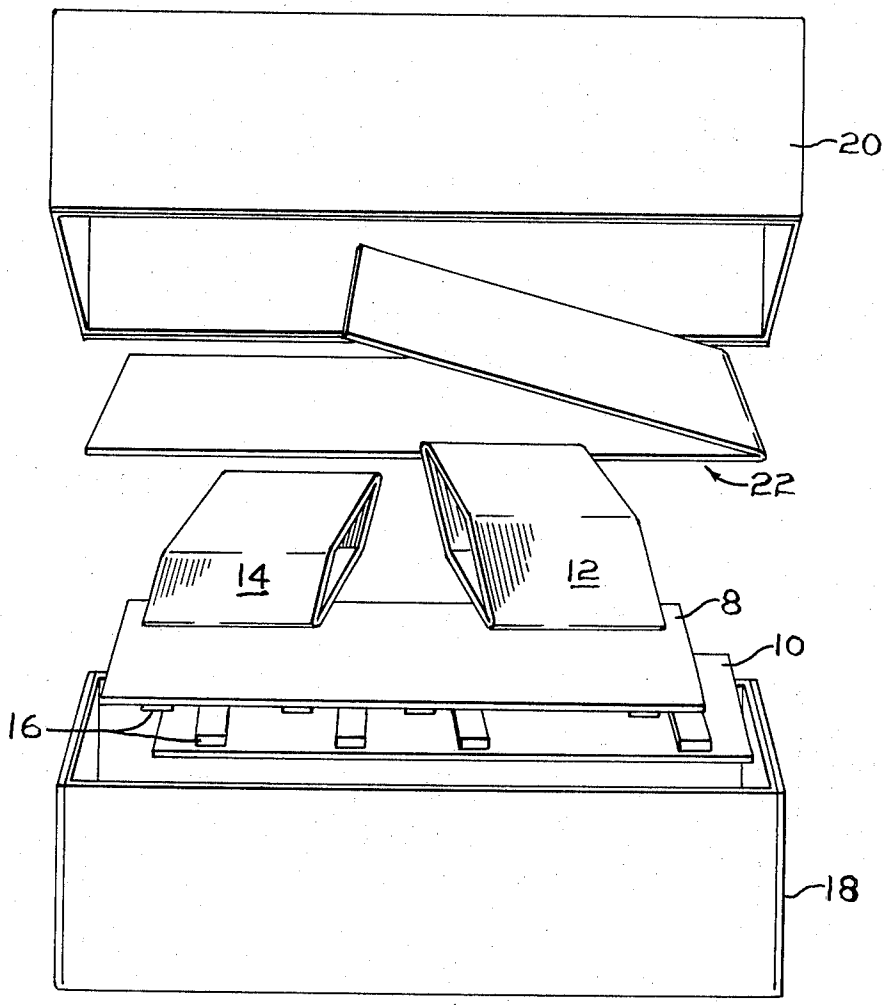
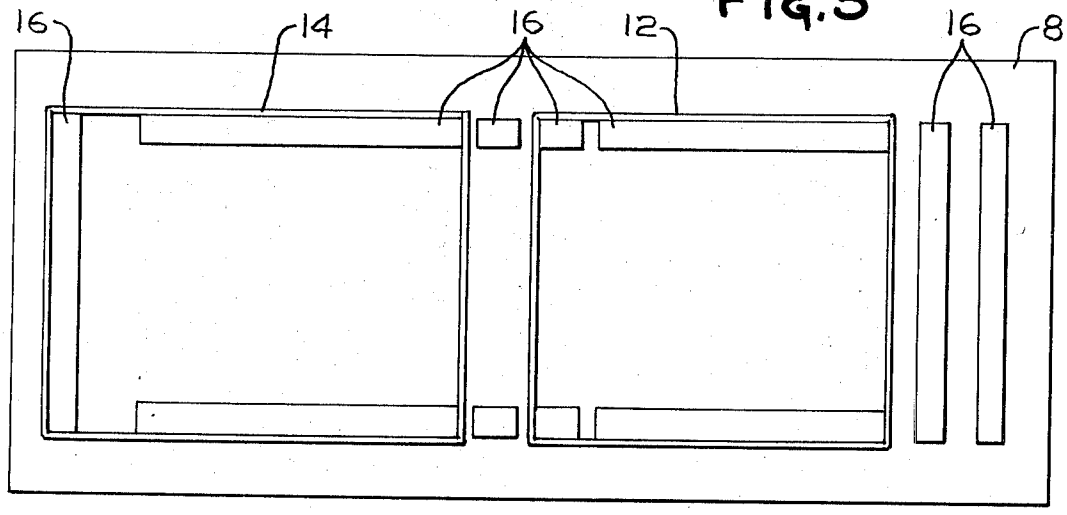


FIG. 4

FIG. 5



COLLAPSIBLE SELF-STORING SHIPPING CARTON

BACKGROUND OF THE INVENTION

In many instances the cost of packaging contributes greatly to the ultimate cost of a product. In certain instances the packaging which is necessary in order to insure that the product reaches its destination without damage may amount to as much as the cost of the product itself. In most cases different size items require identical packaging but of a different size. Accordingly, it is necessary to have duplicate packaging materials and/or tooling to manufacture each different sized packages. This clearly contributes to the cost of packaging.

In view of the packaging costs every attempt is made to provide reuseable cartons when the type of product and type of purchaser permits. In many cases where the package or carton is used to ship conponents or parts used in the manufacture of an end product the manufacturer returns the cartons to the parts supplier for reuse, particularly when the carton is relatively expensive. However, in many cases where the carton cannot be easily disassembled, the actual cost of returning a carton is not a great deal less than the cost of fabricating a new carton.

Recent attention to ecological and natural resource conservation matters have shown the desirability and advantages of returnable containers of all types.

Many attempts have been made to construct "knock-down" cartons, but such attempts have been fraught with many difficulties. A principle problem here is that a "knock-down" carton, in most cases, is considerably more expensive than a disposable carton and therefore the advantages of returning and reusing are in large part diminished. Secondly, most prior art "knock-down" reusable cartons are constructed of heavier material and of more substantial construction than a suitable "one-way" carton. Accordingly, the initial cost and weight of the carton, which weight becomes important both in the original shipment and upon the return, is so great that the usefulness of the returnability feature is largely diminished.

In view of the foregoing, it is an object of this invention to provide a carton which is strong but light in weight, inexpensive to construct from commerically available material, and adapted to be knocked down and returned for reuse.

Another object of this invention is to provide a sturdy lightweight reusable carton which, in its disassembled or knock-down condition, contains all of the components but of a size which is but a fraction of the size of the assembled carton.

A further object of this invention is to provide a reusable carton that can accommodate various different sized ringlike elements with a minimum of materials.

Another object of this invention is to provide a reusable collapsible carton wherein numerous commonly sized components are employed to fabricate variously different sized cartons for widely varying sized parts.

SUMMARY OF THE INVENTION

By this invention applicant has provided a collapsible self-strong shipping carton which is constructed from commerically available shipping material, such as corrugated box board. The carton itself is preferably comprised of a plurality of "knock-down" packages. Each

package includes two spaced support panels having locating blocks secured to facing surfaces thereof. Extending between the locating blocks on the spaced support panels are core elements which are placed around the locating blocks in the expanded position. The core elements are collapsible for return and reuse. The ringlike elements to be shipped are placed over the core elements. The position of the locating blocks upon the support panel is determined by the size and configuration of the ringlike elements to be retained thereabout. A given support panel, or panels, may have a plurality of support blocks, positioned differently to accommodate various different sizes of core elements which accommodate different sizes of parts to be shipped. In some cases certain of the locating blocks may remain inoperative. Stated differently, a particular support panel may have a number of support blocks or locating blocks positioned thereon. A particular combination of locating or core support blocks are atlernatively employed, depending upon the size and configuration of the core element to be used. The size and configuration of the core element is determined by the size and profile of the ringlike element to be packaged.

A plurality of the package assemblies are held between an upper enclosure member and a lower enclosure member, both of which telescopically receive the upper and lower portions of the package assemblies. The upper and lower enclosure members are open box shaped members which open toward each other when positioned around the package assemblies. The upper and lower enclosure members are constructed so that one may be telescopically received within or over the other for return and reuse of the carton. The combined depth of the upper enclosure member and the lower enclosure member is less than the height of the support panels for the package assembly. Accordingly, the opposed edges of the upper enclosure and lower enclosure members, in position around the package assemblies, do not meet. Therefore, a side enclosure member is employed which extends from the bottom of one enclosure to the bottom of the other. The side enclosure member covers the opening left between the upper and lower enclosures which do not meet.

The height of the support panels are less than the width of the lower enclosures so that the support panels may be laid flat within the upper and lower enclosure members for return. Similarly, the core members are collapsible to be received within the smaller of the upper and lower enclosure members. The side enclosure member is also dimensioned to be received flatwise within the box shaped upper and lower enclosure members.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top plan view of a self-storing carton of this invention, illustrated as containing three package assemblies, but with the upper open box-shaped enclosure removed.

FIG. 2 is an elevational view of the assembled carton showing the upper and lower enclosure members and the side enclosure.

FIG. 3 is an elevational view, with portions removed, of a package assembly showing the core members in position on the core locating blocks secured to the support panels.

FIG. 4 is a perspective view of the various disassembled components of the carton assembly being repackaged for return and reuse.

FIG. 5 is a plan view of one form of a support panel illustrating a number of core element support blocks which are alternatively used in shipping ringlike elements of various lengths but having a common width.

DETAILED DESCRIPTION OF THE DRAWINGS

Referring now more particularly to FIG. 1 of the drawings, there is shown a carton illustrative of the principles of this invention comprising a plurality of packaged assemblies generally denoted **2, 4** and **6.** While the invention is illustrated in connection with three package assemblies, any desired number may be employed.

Each package assembly is comprised of two spaced support panels denoted **8** and **10,** between which extends essentially tubular core members **12** and **14.** The core members are preferably collapsible, for reasons to be discussed in more detail hereinafter. Each of the core support members is illustrated as having one dimension in common. Such an arrangement most efficiently utilizes the carton capacity when the different sized ringlike elements having at least one dimension in common are to be shipped in the same carton. For example, when shipping gaskets for the doors of combination refrigerator-freezer appliances, wherein the width of the lower refrigerator door is the same as the width of the upper freezer door, maximum utilization of cartons space may be made by packaging both gaskets together.

For purposes of this invention, the term "ringlike" is employed to mean a circumferentially continuous member, regardless of its profile or its configuration, having a central opening therethrough. While the drawings and specification describe the invention in terms of a generally rectangular gasket, the principles of the invention are equally applicable if the "ringlike" element is circular, triangular, or irregular as long as there is an opening therethrough.

The core support members are maintained on the support panels by means of spaced locating or positioning blocks **16** fixedly secured to the surface of the support panels. The core members, being hollow, circumscribe the support of locating blocks **16.** The locating blocks serve the dual purposes of retaining the collapsible core members in the expanded condition and also to maintain the core members in position on the support panels. The locating blocks extend only a short distance into the core elements. It is only necessary that the blocks extend into the cores a sufficient distance to securely engage the inner walls thereof to effectively place the blocks in shear when the cores are loaded with ringlike elements.

The package assemblies are telescopically received within the confines of a lower open box-shaped end enclosure **18** and a similarly configured upper open box-shaped end closure member **20.** The width and length of closure members **18** and **20** are selected so that one will fit telescopically within the other, or conversely, so that one will fit over the other. In the carton illustrated both the length and width of the lower closure member **18** is less than the length and width of the upper closure member **20.** The lower closure member is shown as having a length L-**1** and the upper closure member as having a length L-**2.** Dimensionally L-**2** is greater than L-**1.** Similarly the width of the upper closure member is greater than the width of the lower closure member.

Referring more particularly to FIG. **3,** it will be noted that the support panels **8** and **10** have a length L-**3** and height H-**1.** Length L-**3** is less than the length L-**1,** which is the length of the smaller of the box-shaped closure members, so that the panels may be telescopically received into the closure member. Further, the height H-**1** of the support panels is no greater than the width W-**1** of the smaller of the box-shaped closure members so that the former may be laid down within the confines of the latter, as illustrated in FIG. **4,** for return and reuse.

The various lettered dimensions employed to explain the dimensional relationship between the various parts refer to the appropriate inner or outer dimensions with no particular attention being given to the thickness of the material itself. It is to be understood that the thickness of the material of the carton would be taken into account in establishing actual dimensions.

The height, H-**1,** of the support panels **8** and **10** exceeds the combined depths D-**1** and D-**2** of the lower and upper box-shaped closure members respectively. Accordingly, the upper and lower box-shaped closure members do not meet when assembled over the package assemblies. The reason for this is so that when the carton is knocked down and the components laid flatwise in the smaller of the two closures, the larger enclosure will telescope over the smaller one to provide a fully contained carton occupying less space for return shipping than an assembled carton. In fact, the height or depth of the collapsed self-contained knocked down carton will be approximately the height of the deepest of the upper or lower enclosure.

A side enclosure member **22** is placed within the confines of the upper and lower closure members and in a position to circumscribe the package assemblies contained therein. In the preferred embodiment the height of the side enclosure member **22** is essentially the same as the height H-**1** of the support panels **8** and **10.** Accordingly, the side enclosure contributes to the compressive strength of the carton as it extends from the upper enclosure to the lower enclosure. However, in the interest of minimizing the material required it is only necessary that the height of the side enclosure be adequate to bridge the gap between the upper and lower enclosure members **18** and **20.** In this regard it is only necessary that the side enclosure have a minimum height slightly greater than combined dimension of the smaller of D_1 or D_2 and the space of gap left between the upper and lower enclosures. In the illustrated embodiment the side enclosure is constructed of two L-shaped members which are positioned within the confines of the end closure members to thereby form a generally rectangular tubular shaped side enclosure. It is possible of course to construct the side enclosure member of a single piece of material which is collapsible upon itself to a dimension which does not exceed the length L-**1** of the smaller of the closure members.

The carton of this invention is illustrated in FIGS. **1** and **3** as being employed in connection with packaging ringlike elements such as refrigerator gaskets G. The generally rectangular gaskets mounted on cores **12** and **14** have one dimension in common but differ in the other dimension. Such a dimensional relationship would be typical in connection with gaskets for doors of combination refrigerator-freezer applicances

wherein the upper freezer door is the same width as the lower refrigerator door.

To illustrate the flexibility or versatility of the carton of this invention, the packaging assembly **6** of FIG. **1** is shown as being loaded with two different sized ringlike elements indicated at S-1 and S-2. As noted in FIGS. **2** and **3**, the ringlike elements having sizes S-1 and S-2 have a common width but different lengths, or vice versa. Alternatively, it is possible to lend even greater versatility to the carton by loading still another sized ringlike element in other package assemblies as illustrated by the gaskets S-3 loaded on cores **12** and **14** of package assembly **4**. Further, cores **12** and **14** of any of the package assemblies could be partially loaded with ringlike elements S-3 and completed with elements S-1 and S-2 if desired.

Referring now more particularly to FIG. **5**, there is illustrated a modified form of support panel **8** having a plurality of selectively positioned locating blocks **16** secured to the surface thereof. A certain combination of blocks are selected for a particular core element, or elements. Different sized core elements **12** and **14** are illustrated as being used in connection with selected locating blocks, depending on the particular size of ringlike elements to be packaged. While panel **8** is illustrated in FIG. **5** as employing two core members suitable for two particular sized ringlike elements, a number of locating blocks are provided which are positioned in a manner adequate to accommodate **13** different sized core elements. It will be appreciated that such an arrangement allows great flexibility in employing a specific design of support panel and locating block as a common unit from which to construct package assemblies for numerous differently sized ringlike elements.

The material from which various package and carton components are made is not important but from a cost stanpoint it is often preferred to use commerically available corrugated box board. Very often the locating blocks are constructed by laminating a number of thicknesses of corruaged box board.

From the dimensional relationship of the various components described above, it will be recognized that the core member may be separated from the support panels, thereby allowing the support panels to be received within the smaller of the box shaped closure members **18**. The core members **12** and **14** are collapsible upon themselves and therefore may also be accommodated within the confines of enclosure **18**. Similarly, the side enclosure members **22** are dimensioned to be collapsible or folded upon themselves to be received within the closure member. For purposes of clarity, FIG. **4** illustrates only the components used to construct a single package assembly and a single side enclosure. In partice the various components to construct a completed carton comprised of a plurality of package assemblies will fit within enclosure **18**. When enclosure **18** is fully loaded with all of the components used to construct a full carton, the upper enclosure member **20** is telescopically received thereover to provide a knockdown shipping carton suitable for return and reuse. It will be recognized that the knock-down requires less space for shipping than the fully assembled carton. In fact, the volume of the knocked down carton illustrated is no greater than the volume of the larger enclosure alone.

In view of the foregoing description of an illustrative embodiment of this invention, it would be appreciated that the inventory of material and standard sized parts required to construct a self-storing shipping carton capable of packaging a large variety of different sized elements at a minimum of cost is provided.

I claim:

1. A collapsible self-storing shipping carton for packing a plurality of ringlike elements of at least two distinct sizes, each of said sizes having at least one dimension in common with at least one dimension of the other and at least another dimension different from at least another dimension of the other, said carton comprising larger and smaller open box-shaped closure members dimensioned such that the larger will telescopically receive the smaller and at least one package assembly capable of being disassembled and collapsed for reception within the confines of said smaller closure member, said at least one package assembly comprising:

A. two spaced essentially planar support panels telescopically received by said closure members and disposed substantially normal to the bottom surfaces of said closure members.

B. at least two spaced collapsible core members extending between said support panels, each of said core members having

1. at least one dimension substantially corresponding to said at least one common dimension of the ring-like elements, and

2. at least one other dimension which is additive to at least one other dimension of the other of said at least two core members and to the space between said at least two core members to substantially correspond to the larger of said at least another different dimension of said ring-like elements; and

C. at least two core member locating and positioning means on each of the facing surfaces of said panels to maintain said core members in a non-collapsed condition and in position with respect to said panels.

2. The collapsible self-storing shipping carton defined in claim **1** wherein said package assembly comprises additional locating and positioning means on each of the facing surfaces operative to permit replacement of at least one of said at least two shaped collapsible core members by at least one collapsible core member having at least one other dimension different from said at least one other dimension of said at least one of said least two collapsible core members to be replaced.

3. The collapsible self-storing carton defined in claim **1** further comprising a generally rectangular shaped tubular side closure member extending between said larger and smaller open box-like closure members to thereby enclose said at least one package assembly, said side enclosure being collapsible upon itself for reception within the confines of said smaller open box-like closure member.

4. The collapsible self-storing carton defined in claim **3** wherein said package assembly comprises additional locating and positioning means of each of the facing surfaces operative to permit replacement of at least one of said at least two spaced collapsible core members by at least one collapsible core member having at least one other dimension different from said at least one other dimension of said at least one of said at least two collapsible core members to be replaced.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 3,872,969

DATED : March 25, 1975

INVENTOR(S) : ROGER BURL JEAN

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 1, line 42 after "returnability" insert ---or reuseability---; Column 1, line 64 change "self-strong" to ---self-storing---; Column 2, line 20 change "atlernatively" to--alternatively---; Column 2, line 47 after "the" insert ---upper and---; Column 4, line 67 change "applicances" to ---appliances---; Column 5, line 42 change "corruaged" to ---corrugated---; Column 5, line 39 change "stanpoint" to ---standpoint---; Column 5, line 56 change "partice" to ---practice---; Column 5, line 63 change "requires less" to ---carton requires considerably less---.

Signed and Sealed this

twenty-sixth Day of *August 1975*

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks