

May 6, 1969

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3,442,372

SHIPPING STRUCTURE

Filed Sept. 19, 1967

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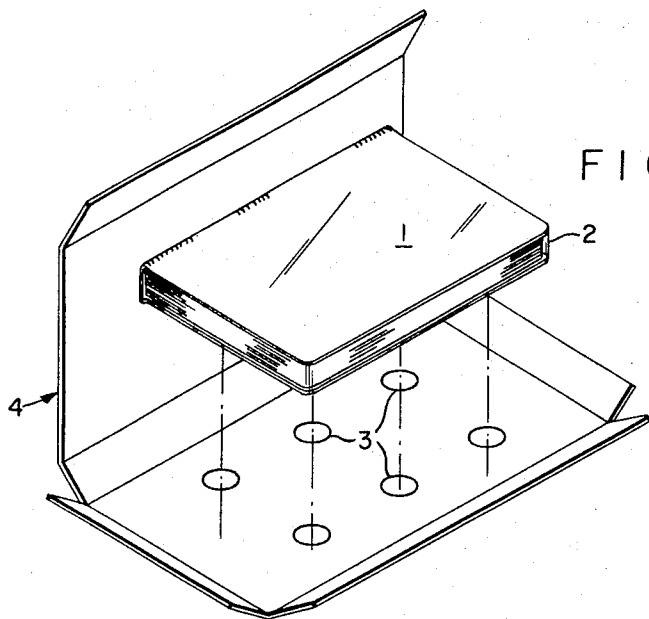


FIG. 1

FIG. 2

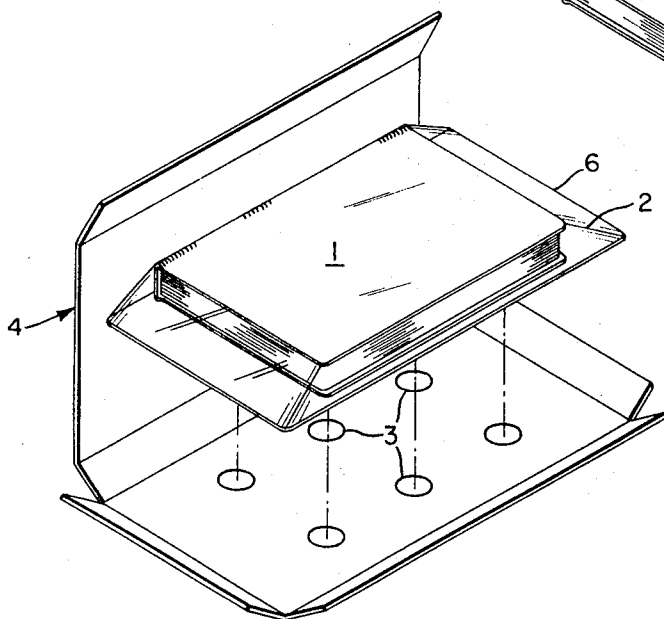
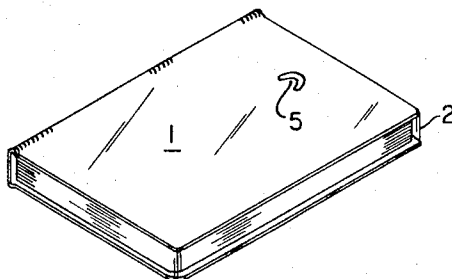


FIG. 3

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FIG. 4

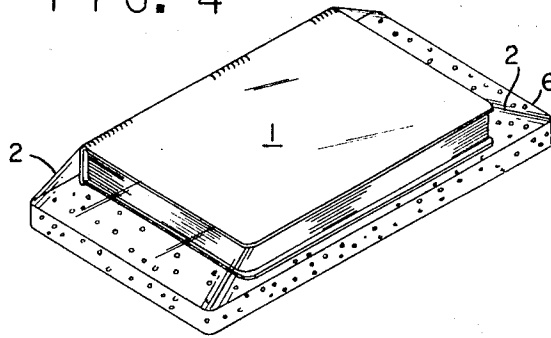
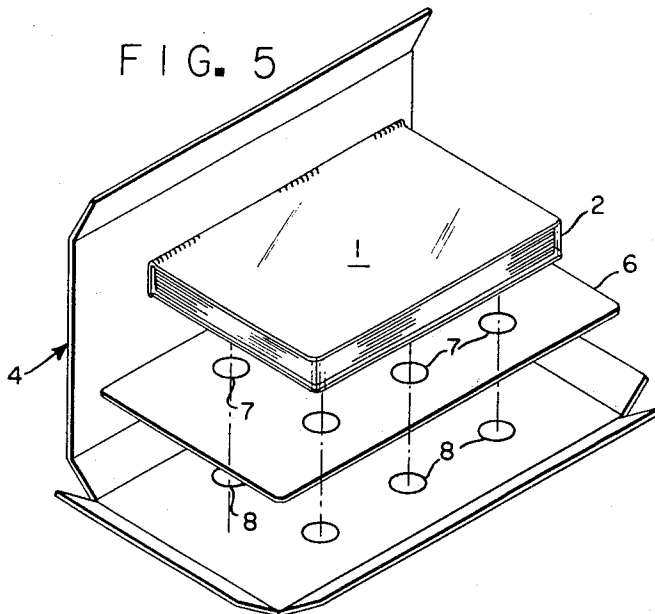


FIG. 5



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SHIPPING STRUCTURE

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6 Claims

ABSTRACT OF THE DISCLOSURE

A shock resistant shipping structure comprising a film overwrapped article adhered to a supporting sheet which extends beyond the boundary of the overwrapped article and which sheet is adhered to, or comprises one wall of a conventional shipping container having a greater internal volume than the volume of the article.

Background of the invention

The accelerated handling of packages in transit via truck, railroad, and air cargo systems has resulted in an increase in the damage to the products being handled. This increased product damage necessitates the use of improved, shock resistant packages by manufacturers of small and fragile articles. Increased cost of packaging has resulted from the use of shock resistant packages since these packages attain the improved performance by use of increased container wall thickness and/or use of separate interior packing liners, supports, pads, partitions, preformed pieces and/or premolded supports. The use of such container interior pieces is generally successful if the packaged product is tightly enclosed in the container to prevent internal product movement.

The use of separate, product retaining, interior pieces is not economical when packaging various sized articles in a continuous operation. A large inventory of pieces is required in such a case in order to accommodate all of the shapes and sizes of products being shipped.

Summary of the invention

The shipping structure of this invention comprises an article overwrapped in a web of packaging material in a contour conforming configuration which, in turn, is adhesively secured to an interior wall of a conventional shipping container that has internal dimensions exceeding all of the corresponding external dimensions of the article being packed.

Additional protection can be achieved by first securing the overwrapped article to a base sheet and then securing the base sheet to one interior wall of a conventional shipping container.

Reference to the following figures will facilitate the understanding of this invention wherein:

FIGURE 1 is an exploded view of a shipping structure of this invention;

FIGURE 2 is an illustration of the overwrapped article provided with a tear tab opening feature in the exposed portion of the overwrap;

FIGURE 3 is an exploded view of another embodiment of this invention;

FIGURE 4 is an illustration of the overwrapped article featuring a shock resistant support sheet; and

FIGURE 5 is an exploded view of yet another embodiment of this invention.

Description of the preferred embodiment

The essential components of the shipping structure of this invention are shown in FIGURE 1 and comprise an article 1, a packaging material overwrap 2, adhesive means 3 and an outer protective container 4. The article

1 is overwrapped in the web of packaging material in a contour conforming configuration as shown. The overwrap material used on the article can be selected from packaging materials such as paper, coated paper, glassine stock, cellophane and thermoplastic web materials made from polyethylene, polyamide, polyvinylidene chloride, polypropylene, vinyl chloride, polyester, etc. The selection of the specific type of wrapping material to be employed is dependent on the intended use, the cost, the size and the weight of the article. The selected wrapping material can be formed around the article by folding the web of wrapping material around the article and sealing or adhesively securing the overlapped layers of the folded web to themselves.

It is preferred that an oriented, heat-shrinkable, thermoplastic web material, such as heat shrinkable polyethylene be employed as the wrapping material and that the web be heat shrunk around the article. Well known methods for packaging articles in heat shrinkable film can be employed, such as first overwrapping the article in two webs of film or in a single web of folded film, sealing the overlapping webs around the perimeter of the article and finally heat shrinking the overwrap into a tightly conforming web around the contour of the article. Similarly, a section of heat shrinkable, thermoplastic tubing can be shrunk around the article leaving openings in opposing ends of the package.

The adhesive means employed to secure the overwrapped article to one wall of the shipping container can be strips of two side coated, heavy duty, pressure-sensitive adhesive tape or commercially available adhesives such as epoxy, contact, resin base, elastomeric base, or pressure-sensitive adhesive. It is preferred that a polyvinyl acetate or a vinyl acetate copolymer based resin emulsion be employed to provide the interface bond because of their high strength throughout the exposure temperature range of 0° F. to 120° F., their ease of handling and their ability to adhere to both thermoplastic films and cellulosic structures.

The container 4 is preferably of corrugated board construction and formed into a conventional shipping carton. The construction shown in FIGURE 1 is a five panel folder which is very practical for use in preparation of the shock resistant shipping structure of this invention when the article being packaged is a book. Other container constructions such as the overlap slotted box, full flap slotted box and double cover box work equally well in affording the desired product protection. Known conventional methods for sealing the container, such as by use of tape, staples, adhesives, and straps can be employed in effecting the container closure.

The shock resistant properties of the shipping structure of this invention are achieved by adhering the overwrap 2 on the article 1 to one panel of the container 4 as shown in FIGURE 1 by the adhesive means 3. The overwrapped article is adhered to one of the inside surfaces, preferably to the inside bottom surface of container 4 so that it is in the centermost portion of that surface permitting portions of that surface to extend beyond the boundary of the article 1 in the length and width directions. Additionally, the internal height of the container 4, when folded, exceeds the height of the article 1 so that there is free space surrounding five of the six sides of the overwrapped article and the sixth side of the overwrap is securely affixed to one wall of the shipping container by use of the adhesive means between the wall of the shipping container and the overwrap on the article.

FIGURE 2 shows an embodiment of the above shipping structure provided with opening means comprising tear tab 5 formed in an exposed surface of the overwrap before the overwrap is applied to the article 1. When using thermoplastic film for the overwrap, it is preferred

that such a tear tab be formed by melting a notch in the web of the thermoplastic film before the film is formed into the overwrap 2. This provides bead reinforcement around the notched opening and the notch itself will distort slightly when the overwrap is formed, thereby providing a convenient means for initiating an opening tear in the overwrap.

FIGURE 3 shows a variation in the construction of the shock resistant shipping structure of this invention wherein the article 1 is first placed on a base support sheet 6, preferably arranged so as to support the article within its centermost area, and then both are overwrapped in heat shrinkable thermoplastic film 2. The length and width dimensions of the support sheet should exceed the corresponding dimensions of the article but should at most equal the corresponding internal dimensions of the container. The heat shrunken, sheet supported article is then adhered to the bottom inside surface of the shipping container 4 by the adhesive means 3. This construction provides for additional shock resistant product protection in that the affixed side of the packaged article has additional cushioning between the article 1 itself and the external shipping container 4.

FIGURE 4 shows an additional embodiment of this feature wherein the support sheet 6 comprises a shock resistant structural piece such as molded polystyrene foam. This support piece can also be molded into a contour conforming configuration such that it partially envelops the article 1 and is tightly secured to the article by the overwrap 2. This embodiment is preferred when fabricating shock resistant shipping containers for delicate electronic and glass articles of manufacture.

An additional variation in the construction of the shipping structure is illustrated by FIGURE 5 wherein the already film 2 overwrapped article 1 is adhered to the centermost area of the base support sheet 6 by a first adhesive means 7 and the support sheet in turn is adhered to the bottom inside surface of the container 4 by a second adhesive means 8. The relative dimensions of article, support sheet and container are similar to those in the above embodiments.

The advantages of the use of the shock resistant shipping structure of this invention are that a minimum of shipping materials are required, the cost and weight of the packaged finished product is reduced, various sized packages can be prepared concurrently and the product is protected from damage due to vibration and impact. Such loads that may be impressed on the shipping structure of this invention are absorbed by the conventional shipping container employed and cannot be transmitted through the shipped article since the article is contacting only one side of the container.

An additional advantage of the shipping structure of this invention is that randomly sized articles of manufacture such as books can be prepared for shipment in an economical and convenient two phase discontinuous operation wherein the articles can be protectively overwrapped immediately after being produced and prepared for shipment at a subsequent time. The product is thus protected from the time of manufacture until the time of sale but the finished product inventory is volumetrically limited to only that required for the product and not to the cumulative volume of the product and the required associated shipping container materials.

What is claimed is:

1. A shipping structure comprising:

- (a) an article,
- (b) a packaging material completely wrapped around said article and heat-shrunk to a contour conforming configuration,
- (c) a closed container around said wrapped article, the internal height, length and width dimensions of said container exceeding the corresponding dimensions of the wrapped article, and
- (d) adhesive means securing one surface of said wrapped article to one of the inside surfaces of said container.

2. The shipping structure of claim 1 wherein said wrapped article is provided with opening means.

3. The shipping structure of claim 1 wherein the bottom surface of said wrapped article is adhesively secured to the inside bottom surface of said container.

4. The shipping structure of claim 3 wherein the packaging material is a thermoplastic film overwrap.

5. The shipping structure of claim 4 wherein a base support sheet is provided between said article and said thermoplastic film overwrap arranged to support said article within its centermost area, the length and width dimensions of said support sheet exceeding the corresponding dimensions of said article but not exceeding the corresponding internal dimensions of said container.

6. A shipping structure comprising:

- (a) an article,
- (b) a thermoplastic film overwrap around said article disposed in a tightly fitting, contour conforming configuration,
- (c) a base support sheet arranged to support said overwrapped article within its centermost area, the length and width dimensions of said support sheet exceeding the corresponding dimensions of the overwrapped article,
- (d) a first adhesive means securing the bottom of said overwrapped article to the centermost portion of said support sheet,
- (e) a closed container around said overwrapped article and support sheet, the internal height of said container exceeding the height of said overwrapped article and support sheet, and the internal length and width dimensions of said container at least equaling the corresponding dimensions of the support sheet, and
- (f) a second adhesive means securing the bottom of said support sheet to the inside bottom of said container.

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