

Feb. 14, 1961

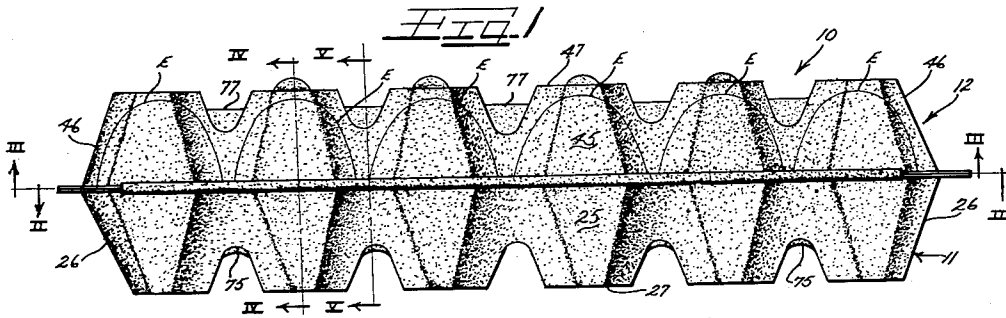
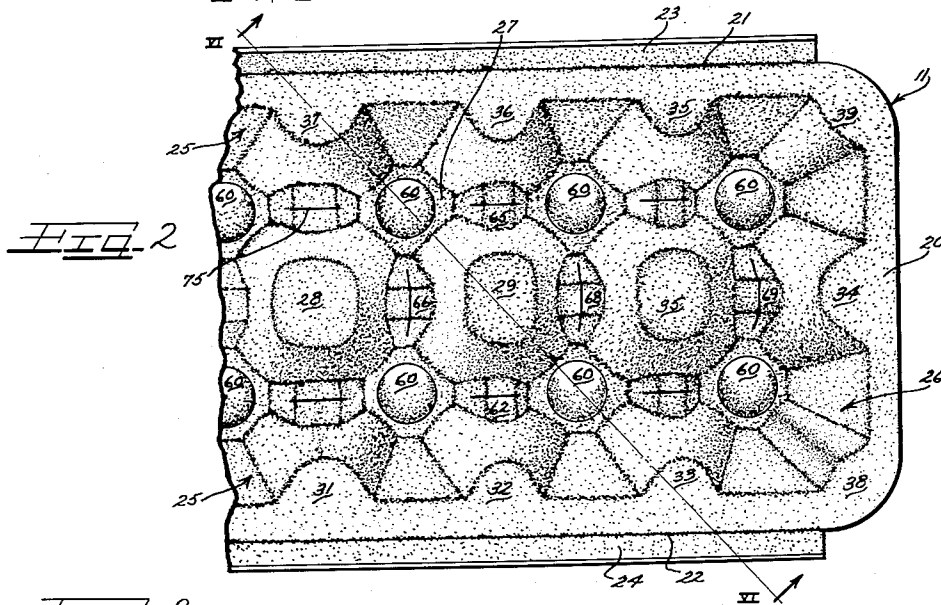
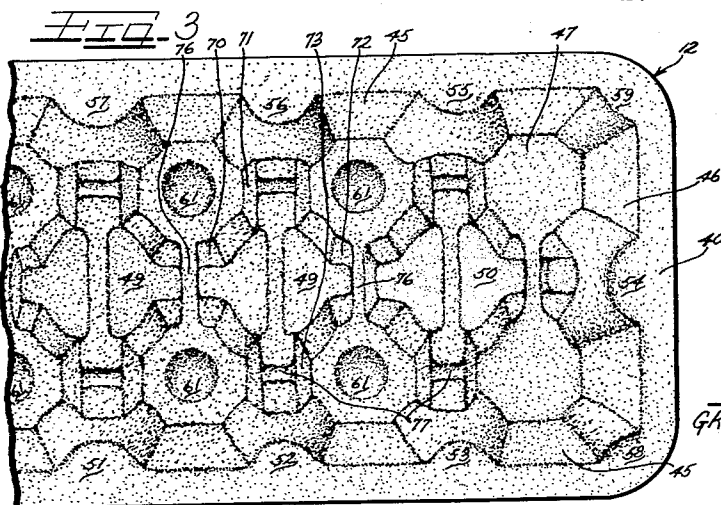
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2,971,685

MOLDED CARTON FOR FRAGILE ARTICLES

Filed May 3, 1957

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

FIG. 4

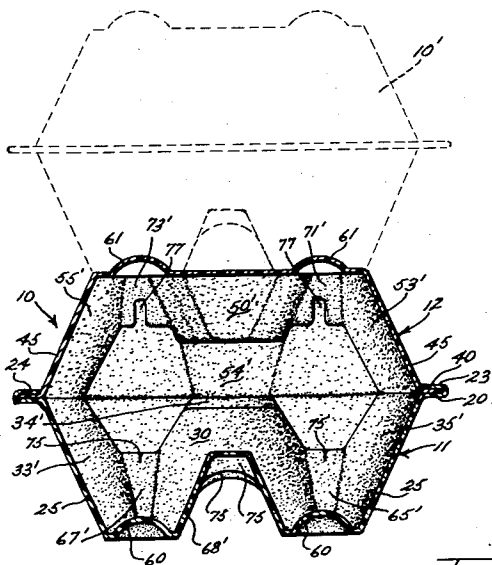


FIG. 5

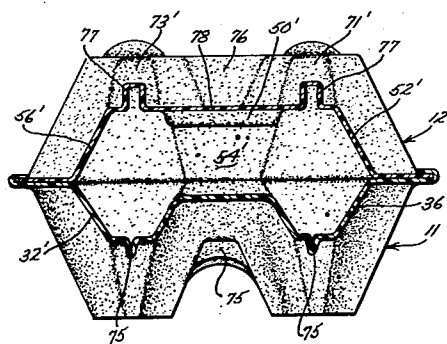
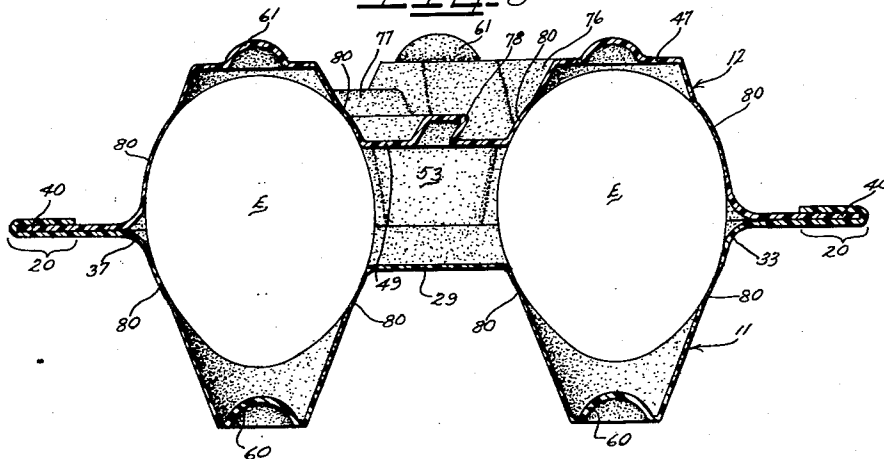


FIG. 6



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MOLDED CARTON FOR FRAGILE ARTICLES

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4 Claims. (Cl. 229-2.5)

This invention relates generally to cartons for packaging fragile articles, and more specifically to an improved carton for packaging eggs.

Although the principles of the present invention may be included in various embodiments of carton, a particularly useful application is made in cartons of the type provided for the storage, shipment, and display of eggs.

When eggs are placed in cartons which, in turn, are placed on display in self-service retail establishments, the eggs themselves have heretofore been rendered substantially invisible, so that the buyer is forced to rely solely on price, trademark, and the like in exercising his judgment as to which eggs to procure. Furthermore, the typical egg cartons now available are not particularly well suited for handling eggs of varying sizes. Thus, when pullet eggs are sold in standard cartons, they may move around quite freely within the respective cells or pockets of the carton. Furthermore, egg producers have been unable to sell abnormally large eggs using the same manner of market packaging as they do for conventionally sized eggs, because if the carton is made large enough to accommodate a more or less average size egg, the carton is too small to handle a somewhat larger egg. Among the larger egg producers, this is a real problem, particularly where a good egg-laying breed of hens is used, such as leghorns which are known to frequently lay double-yolk eggs.

The present invention contemplates the utilization of molded thermoplastic, all or part of which may preferably be transparent material. It further contemplates the utilization of reduced cross-sectional thicknesses at the points of egg support whereby a somewhat greater degree of resiliency is obtained at such points. By having an improved resiliency characteristic, the egg carton readily adapts itself under the force of the egg to grip and support eggs having larger and smaller sizes than the more conventionally sized eggs.

Accordingly, it is an object of the present invention to provide a carton for supporting one or more fragile articles.

It is a further object of this invention to provide a carton which supports and encloses one or more fragile articles, but enables their being viewed through such carton.

A still further object of the present invention is the provision of a carton for supporting one or more articles and while so doing, enhancing their desirability such as by imparting to them a glossy appearance and enlarged appearance or both.

Yet another object is the provision of a carton having increased resiliency at its points of support within the carton.

Yet another object is the provision of a carton for articles wherein the carton may expand to grip the article and may further expand to grip even larger articles.

Another object of this invention is the provision of a novel method and means for closing a carton.

Yet another object is the provision of means whereby

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a plurality of cartons may be stacked on top of one another in relatively locked position with respect to each other.

Many other advantages, features and additional objects of the present invention will become manifest to those versed in the art upon making reference to the detailed description and the accompanying sheets of drawings in which a preferred structural embodiment incorporating the principles of the present invention is shown by way of illustrative example.

On the drawings:

Figure 1 is a side elevational view of a carton provided in accordance with the principles of the present invention;

Figure 2 is a slightly enlarged fragmentary view taken along line II—II of Figure 1 of the interior of the base, slightly in perspective;

Figure 3 is a slightly enlarged fragmentary view taken along line III—III of Figure 1, showing an interior view of the cover;

Figure 4 is a cross-sectional view taken along line IV—IV of Figure 1;

Figure 5 is a cross-sectional view taken along line V—V of Figure 1;

Figure 6 is an enlarged cross-sectional view taken along the diagonal line VI—VI of Figure 2, and with the cover of Figure 3 in position thereon;

Figure 7 diagrammatically illustrates how a filled carton may be sealed or closed; and

Figure 8 diagrammatically illustrates how the base of Figure 2 may be nestingly received within the cover of Figure 3.

On the drawings:

The principles of this invention are particularly useful when embodied in a carton such as illustrated in Figure 1, generally indicated by numeral 10. This embodiment of the carton includes a tray-like base or base section 11, and a tray-like cover or cover section 12. The base member 11 preferably comprises thermoplastic material which is generally rigid at ordinary temperatures and which is permanently deformable at elevated temperatures. Such material, if produced in thin sections, is resiliently flexible at ordinary temperatures.

The base 11, as shown, includes a perimetral flange 20 having longitudinal edges 21 and 22 to which are attached integral flaps 23 and 24, respectively. If desired, the flaps 23 and 24 may be carried by the corresponding edges of the cover 12; however, it is preferable for these flaps to be a part of the base 11. Extending downwardly from the flange 20 are side walls generally indicated at 25 and end walls generally indicated at 26. Joining the side walls 25 and the end walls 26 is a bottom wall 27. In this embodiment, the side and end walls 25 and 26 convergently taper toward each other so that the bottom wall 27 has a somewhat smaller projected area than does the central opening in the flange 20. Disposed about the bottom wall 27 are a plurality of hollow posts, those showing in Figure 2 including full posts 28, 29 and 30, half posts 31—37, and quarter posts 38 and 39. These various posts have convex frusto-conically configured or tapered surfaces. The upper ends of the fractional posts are joined integrally with the flange 20 while their side edges join integrally with the sides 25 and the ends 26. The various posts are disposed in such an arrangement so that portions of the surface of the respective posts define the lower part of pockets or compartments into which eggs or other fragile articles may be received. By reference to Figures 4-6 it will be noted that the central or full posts, such as 29, extend from the base 27 a lesser distance than do the fractional posts, such full posts terminating short of the plane defined by the flange portion 20 of the member 11.

By referring to Figure 3, it will be noted that the

cover 12 is similar but not identical to the base 11. Thus, the cover-like means or member 12 may also comprise thermoplastic which is permanently deformable at elevated temperatures and which is substantially rigid at ordinary temperatures. When formed of a sufficiently thin quantity of material, the cover, at ordinary temperatures, is resiliently flexible, and while it may be deformed at room temperatures a certain amount without damage, upon the release of the deforming force it resiliently immediately returns to its natural configuration. Preferably, the thermoplastic material of which the cover 12 is made is smooth and transparent and further has a glossy or light-reflecting surface. Thus, when the cover 12 is positioned over the base 11 in the manner shown in Figure 1, the transparent cover permits the viewing of the contents such as eggs E therethrough, as shown in Figure 1.

Referring again to Figure 3, the cover 12 includes a flange 40 from which extend side walls 45 and end walls 46 which are integral with the flange. In the form shown, the side walls 45 and the end walls 46 converge at the top to define a top wall 47. The cover portion shown further includes integral hollow posts 48, 49 and 50 extending inwardly from the top surface 47. These posts 48-50 also have a conical or tapered configuration and are integrally joined at their wider ends with the top 47, their narrower ends terminating in spaced relation to the plane of the flange 40, as best shown in Figures 4-6. The cover 12 further includes a series of half posts 51-57, and a plurality of quarter posts 58 and 59. Each of the fractional posts are likewise provided with a frusto-conical or tapered surface which merges at its smaller end with the flange 40 and at its larger end with the top 47. The various posts are so disposed within the cover to define pockets or compartments which may further grip or hold the articles in the base, the compartments of the cover 12 registering with the posts or pockets of the base 11 as best shown in Figure 1, thereby jointly comprising articulations in the cover 12 and in the base 11. Thus, in the instant embodiment, there are eight portions of frusto-conical surfaces which jointly define any single compartment. Of course, a smaller number of portions, properly disposed, is sufficient. The cover may be provided with a conventional flat portion as part of the top 47 or the end wall 46 to provide a pad for a label or price tag.

Referring to Figures 2 and 4, the bottom wall 27 is inwardly shaped or deformed at a plurality of the pockets so as to define rigid hollow formations 60 that are inwardly directed. In similar manner, at least two compartments in the cover 12 are provided with outwardly directed rigid formations 61, and which have a slightly smaller external dimension than is the internal dimension of the rigid formation 60. It is to be understood that the relative location of the various rigid formations 61 and 60 may be interchanged in whole or in part. Each of the formations 61 and 60 are so spaced with respect to each other that the outwardly directed portions 61 will register with the inwardly directed portions 60 when similar cartons are stacked one on top of the other as best shown in Figure 4. While these formations have been shown to be arcuate, any other convenient configuration may also be utilized. Since the formations 60 and 61 serve to support the carton, it is preferable that they be as rigid as possible. Being rigid, they should be spaced from the article contained within the carton as best shown in Figure 6. When cartons are so stacked, the weight of the contents of the cartons coacts with the hollow formations 60 and 61 to prevent relative lateral displacement of the cartons, thereby enabling the better stacking and display of them.

Referring again to Figure 4, it can be seen that the weight of the upper carton 10' is carried entirely by the side walls 25 and 45, aided at the ends by the end walls 26 and 46. Thus, the tapered surface of the fractional

posts and the respective side and end walls transmit the weight of successive cartons directly without placing any load on any contents within any one of the cartons so stacked.

Since the cover 12 and the base 11 are formed of relatively thin material, there is a tendency for them to be undesirably flexible for overall carton rigidity and too rigid at supporting portions. Accordingly, a series of hollow channels have been provided which are each inwardly directed from the top and bottom surfaces 47 and 27 and which join each of the full posts with the adjacent full and fractional posts. Thus, referring to Figure 2, channel 65 extends from full post 29 to half post 36, channel 66 extends from full post 29 to full post 28, channel 62 extends from full post 29 to half post 32 and channel 68 extends from full post 29 to full post 30. Of course, an endmost full post such as post 30, has a channel, such as 69, which extends to half post 34. In like manner, each of the full posts of the base are joined to adjacent full and fractional posts. Referring to Figure 3, full post 49 is joined by inwardly directed hollow channels 70, 71, 72 and 73 to the adjacent full and fractional posts. In like manner, the other full posts of the cover 12 are joined to the adjacent full and fractional posts. The various channels thus somewhat rigidify the cover member 12 and the base member 11. However, since the various channels comprise the relatively thin and flexible material from which the cover and base members 12 and 11 are formed, further channeling or bracing is provided to rigidify the channels. Referring to Figure 2, each of the channels, for example 65-69, is in turn provided with an outwardly directed channel, formation, or flange 75, also shown in Figures 1, 4 and 5. The channels or formations 75 extend transversely to the axis of the larger and hollow web portions or channels, for example 66. Referring to Figure 3, the channels, such as 70-73, are each provided with an outwardly directed hollow channel 76 or 77. The channels 76 extend upwardly and flush with the top 47 as best shown in Figure 5 while the channels 77 extend for a portion of such distance as best shown in Figure 1. Each of the full posts 48-50 of the cover 12 are also provided with outwardly directed channels 78 as best seen in Figures 5 and 6. Thus, by this rather elaborate system of channeling and cross-channeling, both of the covers and the bases, formed of relatively flexible material, have been rigidized so that they are capable of withstanding rather heavy loading forces. Of course, all of the channeling thus described is disposed intermediate or adjacent to the various pockets or compartments so that the article does not rest or bear on any of the comparatively rigid channels.

As stated above, the article is supported within the pocket by a plurality of converging surfaces, here comprising convexly curved frusto-conical posts. It is preferable that these posts have increased flexibility. Referring to Figure 6, there is shown a cross-sectional view taken generally diagonally through the supporting surfaces of the supporting posts. In this as well as in the other sectional views, the actual thickness of the material comprising the cover and the base has been exaggerated in order to clarify the structure. One of the important features of this invention is that the frusto-conical surfaces of the various full and fractional posts of both the cover 12 and the base 11 have a thickness which is somewhat less than that of other portions of the carton. Thus, the posts serving as supporting means for the article are somewhat more resilient in the direction in which they will be displaced by the article than are any of the other parts in the entire carton. The portions indicated by the numeral 80 in Figure 6 are exceedingly thin so as to provide resiliently yieldable supporting surfaces for the article, such as the egg E. Thus, there is provided a plurality of surfaces having reduced thickness for supporting the article resiliently,

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such surfaces to a slight extent yieldably receiving and conforming to such article.

After the eggs E or other articles have been placed in the previously empty base 11 the cover 12 is then placed in superimposing position over the base 11 and the article E. In this position the eggs or other fragile articles are supported by both the base and the cover in spaced relation from the portions of the carton having the full thickness of the plastic material.

The filled carton may then be passed between a pair of rollers 90 and 91 as shown in Figure 7. The roller 91 is a back-up roller which bears against the lower surface of flange 20 of the base. Roller 90 is heated so that the flange portion 23 is softened and deformed thereby. The flange 40 is thus sandwiched intermediate the flange 20 and the flap 23. The flap 23 being in a plastic state when so heated, remains in the position in which it was deformed by the rollers upon cooling. Where the cover 12 is separable from the base 11 as shown, a similar method is used to close the carton on its opposite side. It is to be understood, however, that the cover and the base may be hinged together along one side and a single means or flap 23 be provided for securing the cover 12 in closed position with respect to the base 11. Further, it is also to be understood that the flap 23 may comprise a separate thermoplastic strip which is brought against both the upper surface of flange 40 and the lower surface of flange 20, roller 91 also then being a heated roller. However, in this preferred embodiment, the flap 23 is integral with one of the tray-like members, here the base 11.

Referring to Figure 4, it can be seen that the flange 40 comprises an extension of the side wall 45 and end wall 46, so that the flaps 23 and 24 in reality extend around a portion of the side wall. When a load is placed on top of the carton, there is a tendency for the upper side wall to buckle outwardly at the flange 40. Thus the intumed flaps 23 and 24 resist such spreading to further increase the external load-carrying capacity of the carton 10. Once the flaps 23 and 24 have been turned around the flange 40, the carton may be opened by applying a manual compressive force to the cover in a direction normal to the flaps 23, 24 and parallel to the plane of the flanges 20 and 40. Under this condition, the respective resilient posts returnably yield so as to allow the disengagement of the flange 40 from the flaps 23 and 24. In like manner, the cover may be compressed for selective reengagement with the base 11.

Referring further to Figure 4, it is preferable that the outside wall-to-wall dimension between the side walls 25, 25 be slightly less than the inside wall-to-wall dimension between the side walls 45, 45. Further, referring to Figure 1, it is preferable that the outside wall-to-wall dimension between the end walls 26, 26 be less than the inside wall-to-wall dimension between the end walls 46, 46. Referring now to Figure 8, when these dimensional relationships are present, the base 11 may be conveniently nested within the base 12 during the period of time that the articles are being removed from the carton. This nesting eliminates the inconvenience and hazard present when a cover is hinged along one side to a base. In the form shown in Figure 8, the depth of the base 11 exceeds the depth of the tray-like cover 12 so that the outer surface of the bottom rests against the inner surface of the top. Of course, if desired, the top may be made longer so that the base 11 is supported at its flange 20 by the flange 40.

Transversely through the carton at the post 28, the carton may be provided with conventional means for separating it into two sections, each capable of holding one-half dozen of eggs, etc.

Accordingly, a particularly novel carton has been provided which supports the fragile article, especially in a more resilient manner than has heretofore been done. Further, the structure permits the viewing of the article,

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and enhances the article to the prospective buyer. Still further, the carton of this invention is capable of handling a wider variety of sizes of articles than has heretofore been possible.

It is to be understood that while this carton has been described as being made of thermoplastic material and adapted to carry one dozen eggs arranged in two spaced parallel rows of six eggs each, such disclosure is by way of illustration and not by way of limitation. Obviously, certain features of my invention may be practiced where other materials are used, and the carton may be constructed to accommodate larger or smaller quantities of eggs or other fragile articles in any desired arrangement of rows, as for example, to carry a dozen eggs in the familiar three rows of four eggs. Although various minor modifications and other equally desirable arrangements for carrying larger or smaller quantities of eggs or other fragile articles might be readily suggested by those versed in the art, it should be understood that I wish to embody within the scope of the patent warranted hereon all such embodiments as reasonably and properly come within the scope of my contribution to the art.

I claim as my invention:

1. A carton for articles, said carton including a tray-like base section having articulations and a separate detachable tray-like cover section having correspondingly arranged articulations; and means integral with at least one of said sections for separably and repeatedly securing said sections together in closed position; the inside transverse dimensions of the articulations of said cover section exceeding the outside transverse dimensions of the articulations of said base section, and the inwardly extending articulations of said cover section being of such vertical extent that when the sections are separated and said cover section is inverted, said cover section will nestingly receive said base section by an amount substantially equivalent to the vertical extent of the base section articulations.

2. In a carton for supporting at least one fragile article, the improvement comprising, a generally rigid semi-resilient member; said member having a group of integral hollow posts, each of said posts having a convexly frustoconically configured surface; said posts being so disposed that portions of said surfaces define a pocket by and between said surfaces; said member having a reduced thickness only at said post surfaces whereby said generally rigid posts are rendered somewhat more resilient at said surfaces for receiving and resiliently supporting the article.

3. In a carton for supporting at least one fragile article, the carton having a pair of generally rigid base and cover members jointly having top, bottom, and load-carrying side walls, and jointly defining at least one packing cavity, said side walls being convergently tapered toward at least said bottom wall and adapted to support the article in spaced relation from the bottom wall, the improvement comprising: a first rigid hard hollow formation in one of the top and bottom walls extending inwardly into the cavity in spaced relation from the article; and a second rigid hard formation in the other of the top and bottom walls extending outwardly of the closed carton for being nestingly received in a hollow formation of another similar carton, which is similar to said first hollow formation, with which other carton said carton is to be stacked, thereby to prevent relative lateral displacement between the cartons when stacked, and also to prevent engagement of the article by either of said formations.

4. In a carton for supporting at least one fragile article, the carton having a pair of generally rigid base and cover members jointly having top, bottom and load-carrying side walls, and jointly defining at least one packing cavity, said side walls being convergently tapered toward at least said bottom wall and adapted to support

the article in spaced relation from the bottom wall, the improvement comprising: a first rigid hard hollow formation in the bottom wall and extending inwardly into the cavity in spaced relation from the article; and a second rigid hard formation in the top wall and extending outwardly of the closed carton for being nestingly received in a hollow formation of another similar carton, which is similar to said first hollow formation, with which other carton said carton is to be stacked, thereby to prevent relative lateral displacement between the cartons when stacked, and also to prevent engagement of the article by either of said formations.

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