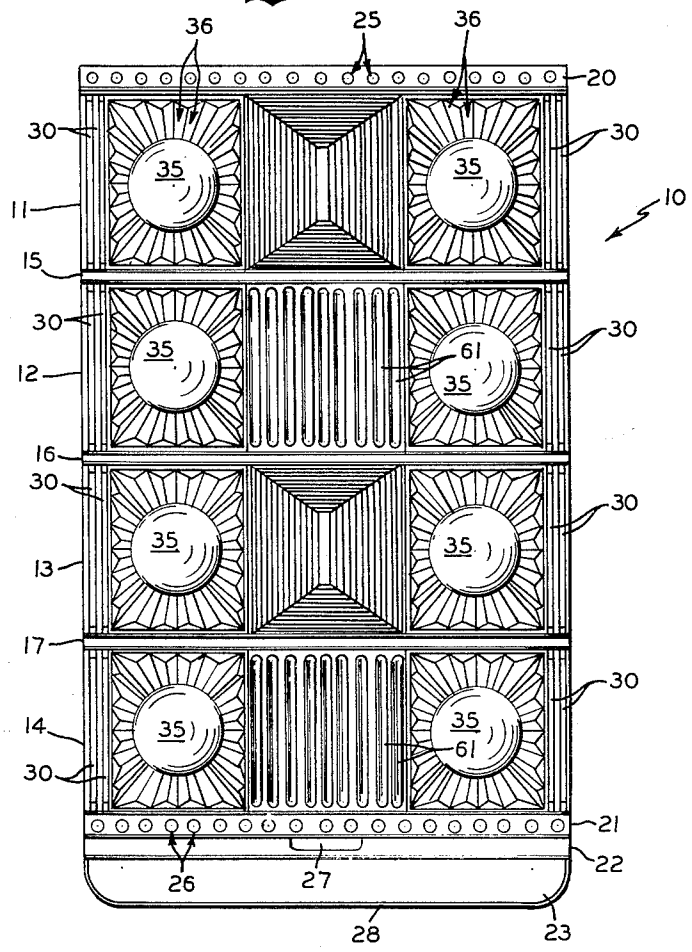
Sept. 4, 1962 C. L. WHITEFORD 3,052,347

PACKAGE FOR FRAGILE ARTICLES

Filed Jan. 4, 1960 3 Sheets-Sheet 1

Fig. 1



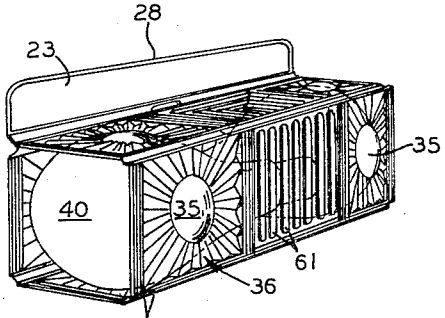
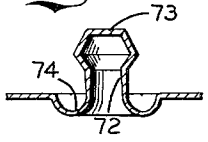


Fig. 2

Fig. 9



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Sept. 4, 1962 C. L. WHITEFORD 3,052,347

PACKAGE FOR FRAGILE ARTICLES

Filed Jan. 4, 1960 3 Sheets-Sheet 2

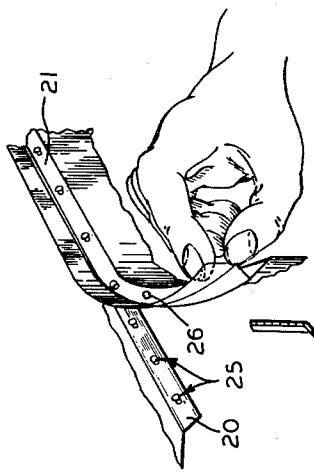


Fig. 8

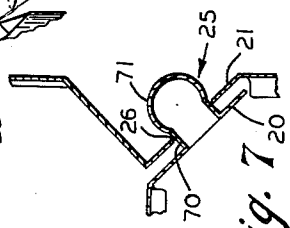


Fig. 7

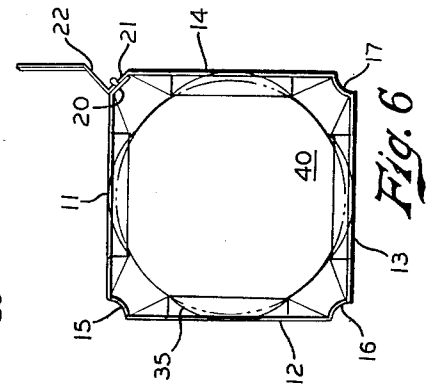


Fig. 6

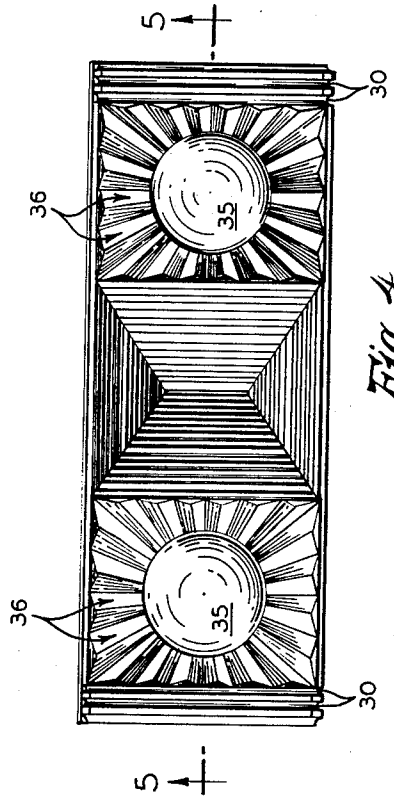


Fig. 4

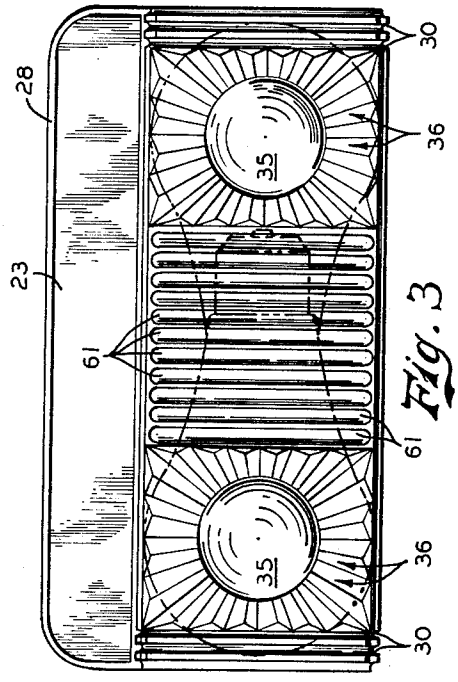


Fig. 3

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PACKAGE FOR FRAGILE ARTICLES

Filed Jan. 4, 1960 3 Sheets-Sheet 3

Fig. 5

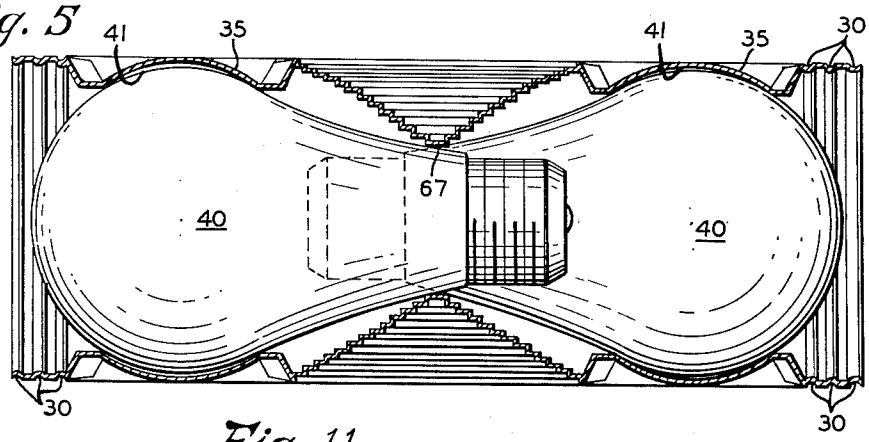


Fig. 11

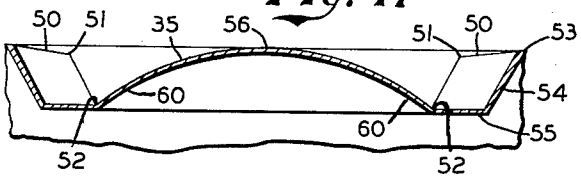
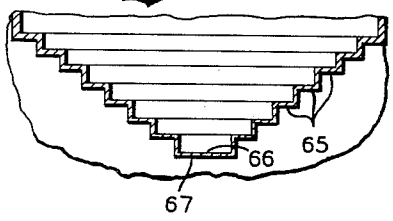


Fig. 12



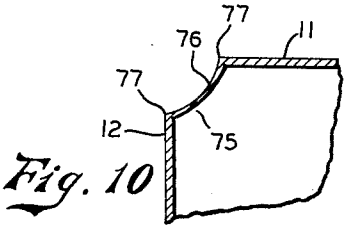
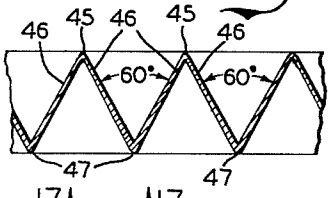


Fig. 10

Fig. 13



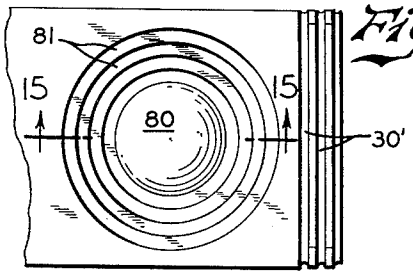


Fig. 14

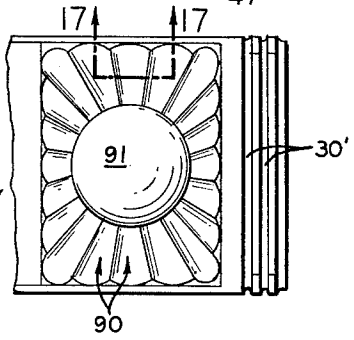


Fig. 16

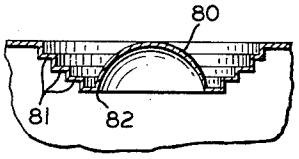


Fig. 15

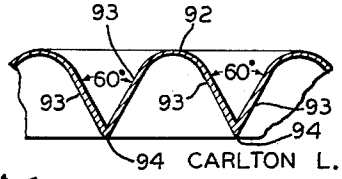


Fig. 17

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United States Patent Office

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Patented Sept. 4, 1962

3,052,347

PACKAGE FOR FRAGILE ARTICLES

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Filed Jan. 4, 1960, Ser. No. 4,589
10 Claims. (Cl. 206—65)

The present invention relates to a new and novel package for fragile articles, and more particularly to an extremely simple and compact inexpensive structure for effectively preventing damage to such fragile articles during normal handling.

The packaging of fragile articles, such as light bulbs, eggs, peaches and similar items, presents a particular problem since a structural arrangement must be provided in the package for somehow resiliently providing a cushion for the articles such that they do not become damaged during normal handling. Many different structures have been designed in the prior art for packaging such fragile articles, and extremely complex and expensive arrangements have been developed for successfully protecting this type of article.

It is, of course, important to provide a package of minimum cost, and yet this consideration must be balanced by the necessity of providing a structure which is sufficiently rigid to withstand impact loads to which the package may be subjected during shipment and when handled by personnel. The desired results are obtained according to the present invention by employing a very thin gauge resilient material which forms a hollow multi-sided body member open at the opposite ends thereof, and having two adjacent side portions thereof suitably interconnected to provide a closed structure. It has been found that a plastic material, preferably biaxially oriented crystalline polystyrene, is particularly suited to form the package according to the present invention and provides substantially improved results over packages employed for similar purposes in the prior art.

Blanks are initially formed of a suitable thin resilient material, the blanks being adapted to be nested upon one another such that they may be efficiently shipped in large quantities in a minimum amount of space. The preferred plastic material also provides an extremely light weight arrangement which, of course, is also beneficial in shipping and handling. An important novel concept of the present invention is the provision of corrugations in the plastic material which not only serve to increase the compression strength thereof, but in the case of biaxially oriented crystalline polystryrene also substantially increase the tensile strength thereof. These corrugations, according to the present invention, are formed in a major portion of the surface of the body member, and preferably in substantially all of the body member surface. In this manner, the body member is provided with a maximum rigidity and strength in a very expeditious manner. These corrugations are formed in a special manner in the body member to accomplish a number of important functions in supporting articles within the package, and in addition providing special characteristics to the package itself.

Corrugations are provided adjacent the open ends of the package in the form of grooves extending parallel to the edges of the sides adjacent the open ends for strengthening the ends of the body member to resist damage should the package be dropped on its end. In the particular modification illustrated, a plurality of inwardly extending stepped portions provide a means for resiliently holding the shanks of light bulbs within the device and maintaining the light bulbs in proper orientation within the package. Dome shaped members are also provided in each of the sides of the package of smaller diameter than light bulbs or other curved articles which may be supported therein

such that an air pocket is defined between the dome shaped portions and the supported article to cushion the article and prevent damage thereto. These dome shaped portions are also resiliently supported by surrounding corrugations in order to provide a very flexible support for the air cushion.

These corrugations are formed by employing a female die and applying pressure to one side of the plastic material and a vacuum to the opposite side thereof to draw the material into the die. This produces the desired corrugations and various other desired configurations of the finished article, and also provides walls of varying thickness, it being apparent that the most distorted portions of the material will become the thinnest wall portions, and those which are least distorted or not distorted at all become the thickest wall portions. This becomes very significant in the present invention since the thinner wall portions are disposed interiorly of the package when in erected position and the thicker wall portions are disposed on the outer surfaces of the package. In this manner, the thinner more resilient portions are in contact with and support the fragile articles, while the thicker and stronger wall portions are disposed on the exterior of the package for engaging external objects. This is obviously a very desirable feature and provides maximum external strength for the package, while at the same time providing maximum resiliency in the support of the fragile article therein.

An additional important feature of the invention is the construction of the corner portions of the package intermediate adjacent pairs of sides of the package. These corner portions are substantially arcuate in cross-sectional configuration and extend inwardly toward the inner portion of the package. These corner portions are of varying thickness, the thinnest portions being the innermost portions thereof, and the thickest portions being those adjacent the associated sides of the package and outermost of the package. This novel construction of the corner portions is quite important since it permits a larger inner dimension of the package for a given amount of material, and yet the thinner, weakened portions thereof are disposed inwardly and protected, while the thicker, strongest portions thereof are disposed at the outer edges which actually are contacted by external objects. In this manner, the portions of the corners which will actually engage external objects are not weakened, and in fact a very abrasive resistant corner is provided since there is not a single sharp edge but rather a recessed arcuate portion.

An additional important advantage of this particular corner construction is the fact that by simply adjusting the degree of inner curvature of the corner portions, the size of the inner dimension of the finished package may be easily adjusted for a given size blank to thereby adjust in a very expeditious manner the size of the package in accordance with the size of the article to be supported therein and further in accordance with the desired degree of tightness with which the package is to grip the supported article.

The package, according to the present invention, may be considered to be of the wrap-around type wherein the flat blank may be placed upon a supporting surface and the supported articles placed on the blank and the blank subsequently wrapped around the articles and secured in position to provide the complete assembly. By wrapping the package around the supported articles, the article itself produces a tensioning of the body member of the package in addition to the tensioning already produced by the corrugations formed in the body member and actually determines the erected configuration of the package. It should also be noted, however, that the package may be erected into operative position without an article therein, and articles may subsequently be forced into the in-

terior of the hollow body member through the open ends thereof.

The package also includes a novel fastening means wherein a portion formed on one of the sides of the body member is provided with a plurality of studs and a portion on the adjacent side of the package is provided with a plurality of openings for receiving the studs. The studs are provided with enlarged heads of greater dimension than the cooperating openings whereby the studs may be inserted through the openings and the enlarged heads will prevent the two side members from being disengaged from one another. This particular closure means provides a very easily and quickly operated means for locking the free ends of the blank to one another, thereby forming a closed package. The side portion having the openings therein also has an outwardly extending flag formed integrally therewith which is suitable for grasping the serve as a handle and also may contain advertising matter thereon, if desired. This flag portion is preferably reinforced by providing a bead theraround.

The structure, according to the present invention, is quite simple and inexpensive in manufacture, and yet is provided with a very high tensile and compression strength, and effectively resists deformation and resiliently supports fragile articles therein to prevent damage thereto.

An object of the present invention is to provide a new and novel package particularly adapted for packaging fragile articles which are liable to be damaged during shipping or handling.

Another object of the present invention is to provide a package for fragile articles which can be shipped in flat nested position and which provides a larger inner dimension for a given amount of material when erected than prior art packages.

A further object of the present invention is the provision of a package for fragile articles wherein air pockets are provided for cushioning the articles and the articles are effectively resiliently supported within the package.

Still another object of the present invention is to provide a package for fragile articles which is adapted to be wrapped around the articles and to be stressed and maintained in erected position by the articles supported therein.

A still further object of the present invention is to provide a package for fragile articles wherein a simple means is provided for adjusting the finished size of the package while employing blanks of identical size.

Yet another object of the present invention is to provide a package for fragile articles provided with abrasive resistant corners and reinforced ends.

A still further object of the present invention is to provide a package for fragile articles including means for resiliently holding the shanks of the light bulbs in place.

A still further object of the present invention is the provision of a thermoplastic package having an integral thermoplastic fastening means in combination therewith.

Other objects and many attendant advantages of the invention will become more apparent when considered in connection with the accompanying specification and drawings wherein:

FIG. 1 is a plan view of a blank of the package according to the present invention;

FIG. 2 is a perspective view of an erected package made from the blank shown in FIG. 1 and illustrating light bulbs supported therein;

FIG. 3 is an elevation of the erected package according to the present invention;

FIG. 4 is a top view of the package shown in FIG. 3;

FIG. 5 is a sectional view taken along line 5—5 of FIG. 4;

FIG. 6 is an end view of the package shown in FIG. 3;

FIG. 7 is an enlarged view of a portion of structure shown in FIG. 6;

FIG. 8 is a perspective view illustrating the manner of connecting the adjacent ends of the blank to one another;

FIG. 9 illustrates a modified form of fastening means;

FIG. 10 is an enlarged sectional view illustrating the corner construction according to the present invention;

FIG. 11 is another enlarged sectional view illustrating the air pocket construction according to the present invention;

FIG. 12 is a sectional view illustrating the resilient bulb shank holding portions of the package according to the present invention;

FIG. 13 is an enlarged view illustrating the corrugation construction according to the present invention;

FIG. 14 illustrates a modification of the invention;

FIG. 15 is a sectional view taken along line 15—15 of FIG. 14 looking in the direction of the arrows;

FIG. 16 illustrates another modification of the invention; and

FIG. 17 is an enlarged sectional view taken along line 17—17 of FIG. 16 looking in the direction of the arrows.

Referring now to the drawings wherein like reference characters designate corresponding parts throughout the several views, there is shown in FIG. 1 a blank illustrated generally by reference numeral **10** which is substantially flat, and as pointed out previously, a great number of these blanks may be nested upon one another for ease in shipment to desired locations where the packages may be subsequently erected. The blank is preferably formed of a flexible resilient material, such as plastic, and it has been found that a most desirable material for use in the package according to the present invention is a biaxially oriented crystalline polystyrene such as sold under the name "Poly Flex" sold by the Monsanto Manufacturing Company, the material preferably being of thin gauge so as to reduce the expense of the package to a minimum. It has been found that a sheet of this material with a thickness of approximately .0075 inch is very satisfactory to accomplish the purposes of the present invention. The utilization of this type of material has numerous advantages in the particular application to which this invention is directed. Various other plastics may, of course, also be employed, such as poly vinyl chloride, stiff acetate and similar plastics. The important characteristics of "Poly Flex" and any other plastic which might be employed in the present invention are that the plastic is light weight, has a very clear transparency and sparkle, is grease proof, non-toxic and tasteless, water, acid and alkali resistant, is non-curling and relatively easy to print on. Another important feature of biaxially oriented crystalline polystyrene is the fact that corrugating the material not only increases the compression strength thereof, but also quite appreciably increases the tensile strength of the material due to the additional orientation which takes place during the corrugation process. As a matter of fact, the compression strength can be improved as much as 50% by providing corrugations in the surface of the material, and it has been found that corrugations on the order of one-eighth to one-fourth inches in depth are quite satisfactory for accomplishing the desired results. Since corrugation of the surface provides such beneficial results, it is desirable to corrugate a major portion of the surface, and the ideal situation is, of course, to corrugate substantially all the surface of the package in order to provide maximum strengthening and rigidifying of the structure.

Referring again to FIG. 1, blank **10** comprises four panels **11**, **12**, **13** and **14** having corner portions **15**, **16** and **17** between adjacent pairs of the side panels. A pair of connector strips **20** and **21** is provided at opposite ends of the blank, an extension strip **22** being formed integral with strip **21** and a flag portion **23** being formed at the outer edge of strip **22**. The various strips are connected to the adjacent portions along bend lines which are formed during the manufacture of the blank such that the strips may be bent with respect to the adjacent portions as desired. The blank itself is formed with the use of a female die such that the various corner portions, strips and corrugations formed in the blank are produced

by drawing certain portions of the blank downwardly into the recess in the female die by applying pressure to one side of the material and vacuum to the opposite side of the material.

A plurality of male connector members or studs 25 are formed integrally along connector strip 20, and a plurality of connector openings 26 are provided along connector strip 21 for receiving studs 25 as hereinafter more fully described. An opening 27 is formed through the central portion of strip 22, and the purpose of this opening will also be hereinafter pointed out. A strengthening bead 28 is provided around the outer edge of the flag portion 23 for rigidifying and strengthening the flag portion.

Adjacent each opposite edge of the various panels 11–14, a plurality of depressed grooves or corrugations 30 are formed in the panels substantially parallel with the adjacent edge of the panel. These corrugations, as pointed out previously, serve to increase the compression and tensile strength of the material, and in addition provide a reinforced end construction for the erected package such that the ends of the package will resist shock when dropped on the end, for example, the corrugations 30 serving as a strengthening and shock absorbing means.

Each of the panels is also provided with a substantially dome shaped portion 35 which is surrounded by a plurality of corrugations indicated generally by reference numeral 36 extending radially outwardly of the dome shaped portions 35. These dome shaped portions are adapted to serve a specific function in the present invention in providing an air packet in cooperation with the articles supported within the package. This is most easily seen in FIGS. 5 and 6 wherein light bulbs indicated by reference numeral 40 are supported within the dome shaped portions 35 in each of the panels of the erected package. The radius of curvature of the dome shaped portions 35 is less than that of the support portion of the bulbs whereby the small space 41 is provided therebetween within which air is trapped, thereby providing an air pocket between the light bulbs and the package for cushioning the light bulbs. Very satisfactory results are obtained when the radius of the dome shaped portions is on the order of one-sixteenth to one-eighth inches less than that of the supported articles, such as a light bulb.

Each of the dome shaped portions being completely surrounded by corrugations 36 is thereby maintained in proper operative position, and more importantly is resiliently supported such that the entire dome shaped portion and the air pocket defined thereby are resiliently supported by the main body portion of the package thereby providing a very resilient support for the supported articles. Each of corrugations 36 comprises an outwardly facing ridge portion and sloping sides as seen most clearly in FIG. 13 wherein the ridges 45 are defined at the intersection of the adjacent sloping sides 46 of each of the corrugations, and the adjacent side portions 46 intersect at the lower portions 47 to provide the base of the corrugations. As indicated in FIG. 13, the preferable angle between adjacent sides of the corrugations has been found to be approximately 60°, this particular angle providing a maximum of strength and rigidity while providing the desired degree of resiliency. While a particular pattern of corrugations has been illustrated about dome shaped portions 35 in FIG. 1 of the drawings, and this pattern has proved to be very effective, it is also apparent that the particular arrangement of the corrugations and configuration thereof may be varied within wide limits.

Referring now to FIG. 11, an enlarged view of one of the dome shaped portions 35 is illustrated wherein it may be seen that the upper edges 50 of the corrugations slope slightly downwardly and inwardly and to a point 51 and then slope sharply downwardly to a point 52 where they substantially intersect the edge of the recessed dome shaped portions 35. The corrugations and dome shaped portions are formed by drawing the material downwardly

from the level 53 of the original sheet of material, thereby providing the downwardly sloping walls 54 connecting with an annular portion 55 extending substantially parallel to the surrounding original surface portions of the material, and of course the central dome shaped portion 35 extends upwardly from portion 55. The construction is such that the dome shaped portions are recessed inwardly of the original surface of the material whereby the apex portion 56 of the dome is substantially flush with the outer surface of the package, thereby preventing the dome shaped portions from projecting outwardly from the surface of the package.

Another important feature to be noted is the fact that the thickness of the deformed portions of the package will decrease in thickness in accordance with the amount of deformation required of the material, or in other words, the material which is deformed the greatest amount from its original position will be provided with the minimum thinness. This is illustrated in FIG. 11 wherein it can be seen that the thickness of the deformed portions decreases from the outer limits of the die cavity to the central portion thereof such that the thickness of the walls is greatest at the point indicated by reference numeral 53 and is least at the apex portion 56 of the dome. This has an important advantage since the thinner portions 60 at the base of the dome shaped portions which engage the supported article are more resilient than the thicker outer portions thereof, thereby supporting the article by a more resilient portion of the package.

Referring again to FIG. 1, panels 12 and 14 are each provided in the central portion thereof intermediate the two dome shaped portions 35 with a plurality of grooves or corrugations 61 which are closely spaced to one another and extend substantially parallel to the opposite edges of the panels, and also the end portions of the corrugations 61 are disposed closely adjacent the longitudinally extending edges of the panels. These corrugations, of course, serve to strengthen and rigidify the central portions of the panels 12 and 14.

Panels 11 and 13 are provided in the central areas thereof intermediate the dome shaped portions with resilient shank holding portions comprising four downwardly and inwardly tapering walls, each of which comprises a plurality of steps. This construction is seen more clearly in FIG. 12 wherein it may be seen that the downwardly and inwardly extending walls include a plurality of steps indicated by reference numeral 65, the sides of the various steps extending substantially normally to one another. The steps converge toward the bottom of the resilient portions and terminate in a recess 66 at the bottom of the resilient portion. The lower surface 67 of the wall portion adjacent recess 66 is the thinnest wall portion of the resilient shank holding portions and as seen in FIG. 5, this inner wall portion 67 is in engagement with the shanks of the light bulbs for maintaining them in proper operative position when the bulb portion thereof is suitably mounted within the dome shaped portions in the side walls of the package. The resilient shank holding portions are preferably so dimensioned that they apply a slight degree of pressure to the shanks to maintain them spaced apart and prevent undesired movement of the light bulbs during shipping or handling. It should again be noted that the thinner wall portions of the package are in engagement with the supported article, thereby providing the maximum degree of resilience in the support for the articles, and maintaining the thickest and strongest wall portions at the exterior of the package for providing maximum strength to the package itself.

As pointed out previously, an important feature of the invention is the fact that when forming a package, the dimensions may be so selected that the inner dimensions of the package are slightly less than the outer dimensions of the supported article whereby the package may be wrapped around the article such that the article causes a stressing of the material of the package, thereby further

rigidifying the material, and the article also in this manner defines the finished shape of the complete assembly. In order to maintain the package in the desired assembled position, suitable closure means must be provided for connecting the opposite ends of the blank. The closure means may be of various known types, such as stapling the opposite ends together, clamping them together, heat-sealing or cementing them or by sewing them together. However, a novel fastening means is provided according to the present invention which permits the opposite ends of the blank to be quickly and easily secured to one another, and permits the package to be subsequently opened in a very expeditious manner.

Referring to FIGS. 6–8 of the drawings, the novel closure means of the present invention is most clearly illustrated, and as seen most particularly in FIG. 6, connector strip **20** is disposed at a slight angle to the adjacent panel **11** and connector strip **21** is disposed at a slight angle to the adjacent panel **14** such that connector strips **20** and **21** are disposed closely adjacent one another. As seen most clearly in FIG. 7, the male projections **25** each comprises a substantially hollow cylindrical shank portion **70** formed integral with the connector strip **20** and including an enlarged head portion **71** of slightly larger diameter than the cooperating openings **26** provided in connector strip **21**. As seen in FIG. 8, it is apparent that the connector strip **21** may be manually connected to connector strip **20** by successively forcing the large head portions **71** of the male connectors through the corresponding openings **26** formed in connector strips **21**, thereby securely locking the two connector strips together and preventing them from moving away from one another unless each of the male connectors is subsequently disengaged from its corresponding opening by successively forcing them out of the openings.

This novel fastener construction provides a very effective lock between the two adjacent panels **11** and **14**, and permits the package to be completely assembled and locked in operative position in a very simple manner.

As seen in FIGS. 2, 3, 6 and 7, strip **22** is disposed at a slight angle to connector strip **21** when the package is in erected position, and flag portion **23** extends substantially in an upright direction, thereby providing a handle portion which can be easily gripped, and in addition providing a portion upon which printing may be provided for properly displaying advertising matter. The opening **27** provided in strip **22** may be employed for hanging the package on a suitable member for displaying it in a store.

As seen in FIG. 9, a modified form of fastener means is illustrated wherein the male fasteners each comprise a shank portion **72** having an enlarged double tapered flat head portion **73** formed at the upper end thereof and joining with arcuate walls to define an annular arcuate recess **74** surrounding the lower portion thereof. This male fastener is adapted to be formed on connector strip **20** and cooperates with suitable openings provided in the connector strip **21** of slightly smaller dimension than the enlarged head of the male fastener for securing the adjacent ends of the blank in position. This particular construction provides a resilient support for each of the individual male connectors, and the tapered construction of the shanks effectively holds the adjacent connector strips in locked position relative to one another.

Referring now to FIG. 10, the novel corner construction according to the present invention is more clearly illustrated. The corner portions comprise inwardly extending arcuate portions **75** defining a recess **76** extending throughout the length of the package. It should be noted that the central or innermost portion of each of corner portions **75** is the thinnest wall portion, and the outermost portions of the corner portions, or those adjoined with the adjacent panels, are the thickest portions of the corner portions. This arrangement, of course, means that the thinnest and weaker portions of the corner portions are disposed inwardly and in a protected portion, whereas the strongest wall portions are disposed outwardly adjacent the outer surface of the package, whereby the corners will be provided with adequate strength to resist damage when handled. A particular advantage of this corner construction is the fact that the inner dimensions of the package are increased for a given size blank for a certain amount of material employed in the package since the adjacent sides of the package are spaced a maximum distance away from one another, while still providing a very effective strong corner edge. This construction obviously provides a greater inner dimension to the package than conventional type of corners wherein a score line is provided by indenting the material and the material is doubled upon itself to provide the corner portions. The corner construction is also further advantageous as seen in FIG. 10, since there is not a single sharp edge at each of the corners of the package, but rather a pair of adjacent longitudinally extending edges **77**, thereby providing a very abrasive resistant corner construction at each of the three corners of the package other than that at which the closure means is provided.

Referring now to FIG. 14 and FIG. 15, a modification of the invention is disclosed wherein the package may be of substantially the same construction as shown in the previous figures, with the exception that the dome shaped portion of each of the panels is not surrounded by the particular radially projecting corrugations, but is constructed in a slightly different manner. In this modification, the dome shaped portions **80** are surrounded by a series of annular steps **81** which extend downwardly and inwardly to the base portion **82** of the dome-like pockets. This construction provides an arrangement wherein the domed portions are recessed in the desired manner, and they are provided with a very resilient mounting provided by the series of annular steps **81**, the operation of this particular modification being a very similar to that of the dome shaped members previously illustrated. These dome shaped portions **80** are, of course, also suitably dimensioned such that air pockets will be provided between the dome shaped portions and the supported articles. Again, the thinner wall portions surrounding the dome shaped portions are in engagement with the supported article for providing a maximum degree of resiliency in the support for the article.

Referring now to FIGS. 16 and 17 of the drawings, a further modification of the invention is illustrated wherein the arrangement is very similar to that shown in FIGS. 1–13, the exception being that the corrugations **90** surrounding dome shaped portions **91** are provided with a slightly different configuration than those previously described. In this instance, corrugations **90**, as seen in FIG. 17, are provided with rounded apex portions **92** having downwardly extending walls **93** formed at either side thereof. Walls **93** intersect with one another adjacent the lower portions **94** of the corrugations at an angle of preferably 60° in a manner similar to that in which the walls intersect in the corrugations illustrated in FIG. 13 of the drawings. In each of the modifications illustrated in FIGS. 14 and 16, corrugations or grooves **30'** are provided adjacent the edges of the associated panels for strengthening the edge portions in a manner similar to grooves **30** as described in connection with the modification shown in FIGS. 1–13.

It is evident that, although the package according to the present invention is especially adapted to be wrapped around a fragile article, it is also adapted to be erected and locked in operative position and suitable articles, such as light bulbs, may be subsequently inserted in the open ends of the package, whereupon the bulbs will snap into place and properly stress the package. Another important feature of the various modifications is the fact that, although the thickest wall portions are always disposed at the exterior of the package, all the wall portions which actually engage the supported articles are thinner than the main body of the package and are accordingly more resilient and more readily deformable such that the package is

adapted to conform to the shape of the supported article, even though it may be quite delicate and soft as a peach, for example.

Another important feature of the invention is the fact that the tension of the package upon the supported article or the internal dimension of the package may be easily adjusted for a given size blank merely by varying the female die used in forming the blank so as to vary the depth of the corner portions **15**, **16** and **17**. By varying the depth of draw at these corner portions, the internal dimensions of the package may be readily adjusted while maintaining the other desirable features and without appreciably decreasing the strength of the corner portions. It is evident that the corrugations cover a major portion of the surface area of the package, and in fact substantially all of the surface area of the side walls of the package is corrugated so as to provide a maximum amount of rigidity and strengthening of the walls of the package.

The body member or blank which is employed for the making of the package is accordingly tensioned and further oriented by a plurality of corrugations disposed in many different directions, which also readily lend the device toward a very attractive ornamentation in the form of various geometrical configurations of the corrugations which provide not only a very pleasing appearance, but also serve a very important and useful function.

It is apparent from the foregoing that there is provided a new and novel package which is especially adapted to support fragile articles, such as light bulbs, eggs, peaches and so forth. The blanks may be shipped in flat nested stacks and later assembled. The erected package, according to the present invention, may be stressed and maintained in operative position by the articles supported thereby, and the fragile articles are provided with a very resilient mounting supplemented by air pockets which provide a cushioning effect for the articles. The novel corner construction according to the present invention permits a larger inner dimension of the package for a given amount of material, and the package is adapted either to be wrapped around articles, or articles may be inserted within the package through the open ends thereof. The package is provided with abrasive resistant corners and reinforced ends which serve as shock absorbers should the package be dropped on its end. Means is provided for resiliently holding the shanks of light bulbs in operative position so as to prevent undesired movement thereof, and a very simple means is provided for adjusting the size of the finished package while employing the same size blank. The package according to the present invention is quite simple and inexpensive in construction, and yet has high strength characteristics, is quite resilient, and is very reliable in use.

As this invention may be embodied in several forms without departing from the spirit or essential characteristics thereof, the present embodiment is therefore illustrative and not restrictive, and since the scope of the invention is defined by the appended claims, all changes that fall within the metes and bounds of the claims or that form their functional as well as conjointly cooperative equivalents are therefore intended to be embraced by those claims.

I claim:

1. A package for fragile articles which comprises a four sided hollow body means for supporting a fragile article, a fragile article supported by said means, integral fastening means providing an interconnection between adjacent portions of two sides of the package, said fastening means including a plurality of projecting hollow stud means resiliently secured to a portion of one of said two sides by an annular recess, and a portion of the other of said two sides having a plurality of openings formed therein for receiving said studs, each of said studs including a shank portion and an enlarged head portion, said head portions being slightly larger than said openings for positively maintaining a secure interconnection between said two sides.

2. A package as defined in claim 1 wherein each of said studs includes a cylindrical shank portion terminating in an enlarged double tapered flat head portion, and the lower end of each of said shank portions is surrounded by said annular recess of arcuate cross-sectional configuration.

3. A package for fragile articles which comprises a hollow body member, a fragile article supported therein, said body member including walls of varying thickness and having inner portions adapted to engage the supported article and outer portions for engaging external objects, said inner portions all being the thinner portions of said walls, and said outer portions all being the thickest portions of said walls whereby the supported article is supported by the most resilient portions of the package and external objects are engaged by the strongest portions of the package.

4. A package for fragile articles which comprises a multi-sided hollow body member, a fragile article supported therein, the sides of said body member being disposed at angles to one another and having a corner portion formed integrally therebetween, each of said corner portions being curved inwardly toward the interior of said package, said corner portions being of varying thickness, the thinnest portion of said wall portions being disposed at the innermost portion of said corner portion and the thickest portions of said corner portions being disposed at the outermost portions of said corner portions.

5. A package for fragile articles comprising a thin resilient hollow body member having walls of varying thickness, a fragile article supported therein, said body member including inner portions for supporting an article within said package and outer portions for engaging external objects, said outer portions comprising the walls of greatest thickness and said inner portions comprising the walls of substantially less thickness, said inner portions defining with the supported articles a plurality of air pockets for cushioning the supported articles and thereby resist breakage thereof.

6. A package for fragile articles including a multi-sided hollow body member being open at opposite ends thereof, a fragile article supported therein, corner portions defined between adjacent pairs of sides of the body member, each of said corner portions being curved inwardly toward the inside of said package, said corner portions being of varying thickness and having the thinnest portions thereof disposed at the innermost portion toward the center of the package, the sides of the body member including inner portions for engaging a supported fragile article and portions of the sides adjacent said last mentioned portions defining an air pocket for cushioning the fragile article.

7. A package for fragile articles which comprises a thin body member formed of biaxially oriented crystalline polystyrene, said package including wall portions of varying thickness, a fragile article supported by said body portion, certain thinner wall portions of said body member being disposed on the inner surface of said package for engaging a supported article, all the outer surfaces of said package comprising thicker wall portions of the body member, and corner portions of generally arcuate cross-sectional configuration, the innermost portions of said corner portions comprising a thinner wall portion.

8. A package for fragile articles comprising a hollow body member formed of biaxially oriented crystalline polystyrene, a fragile article supported therein, said body member being hollow and being open at the opposite ends thereof, said body member having corrugations formed in the major surface area thereof, said body member including walls of varying thickness, the thinner wall portions extending inwardly of the package and the thicker wall portions being disposed on the outer surfaces of the package, and corner portions defined between adjacent sides of said body member, said corner portions being

of varying thickness and having the thinner portions at the innermost portion thereof, and resiliently supported means on each of the sides of the body member for defining an air pocket to cushion a supported article within the package.

9. In combination a thermoplastic package and integral fastener means therefore comprising a wrap around package having an article supported therein, a first connector strip operatively associated with said package having a plurality of integral hollow stud means projecting from one side of said first strip, said stud means including a shank portion and an enlarged head portion, a second complementary connector strip operatively associated with said package having a plurality of apertures therein of slightly smaller dimension than the said enlarged head portion, said head portion passing through said aperture to fasten said first and second connector strips together.

10. A fastener in combination with a thermoplastic package having at least a first and second section to be connected and unconnected comprising an article supported by said section, complementary first and second thermoplastic connector strips integral with said sections, said first connector strip having a plurality of integral

stud means projecting from one side thereof, said stud means including a hollow cylindrical portion terminating in an enlarged head portion and said second connector strip having a plurality of apertures therein of slightly smaller dimension than the enlarged head portion of said stud means said head portion passing through said aperture to removably secure said first and second sections of said package together.

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