

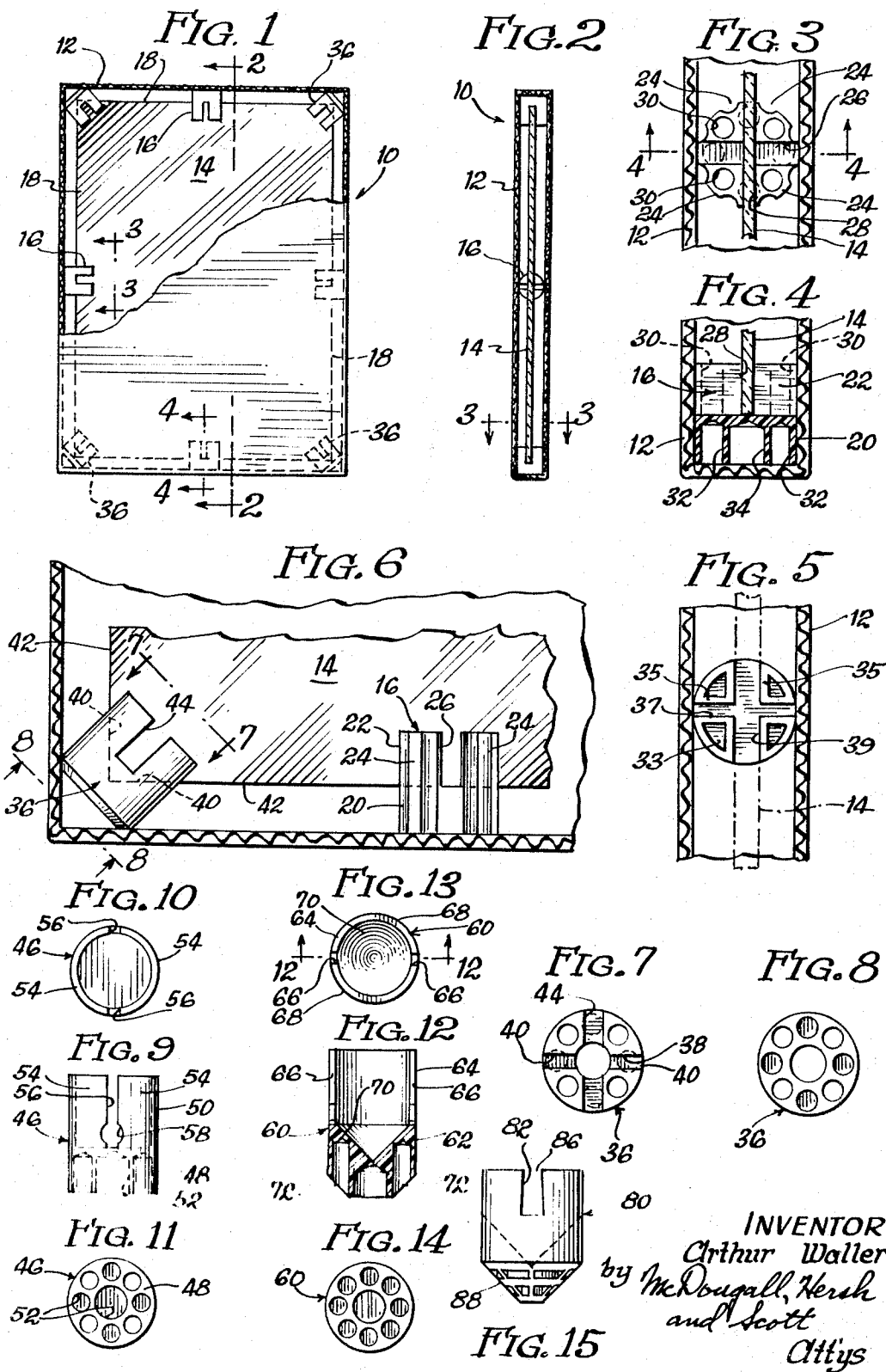
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SPACER MEANS FOR PACKAGING OF MIRRORS AND THE LIKE

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SPACER MEANS FOR PACKAGING OF MIRRORS AND THE LIKE

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This invention relates to spacer elements which are adapted to be associated with the edges of mirrors, plate glass or similar frangible objects whereby the objects can be safely packaged and shipped. Specifically, the elements of this invention are adapted to fit around the object to be packaged, and the elements maintain the object within the package with all surfaces thereof in spaced-apart relationship with respect to the package walls.

The packaging of mirrors and plate glass has always presented a problem due to the fact that any improper placement of the objects in the package can result in loss of the objects during shipping and handling. Since such objects are expensive, means have long been sought which would permit safe packaging of the objects.

Attempts have been made to merely pack the glass objects within relatively soft materials such as saw dust or fine paper and to then enclose them in a cardboard package. This is almost universally unsatisfactory due to the fact that the packing materials are incapable of preventing movement of the relatively heavy glass objects within the package. If the package is dropped or otherwise jarred, the objects within the package will be subjected to severe forces which, if concentrated at certain points, particularly the corners will result in breaking of the object.

It has previously been proposed that spacers could be employed for packaging of such objects as mirrors and plate glass whereby the objects would always be maintained in spaced apart relationship with respect to the package walls. Cardboard strips have usually been employed for such purposes. The strips are slotted and are adapted to be arranged all about the edges of the object to provide support for the objects within the package.

Such spacers have not been completely satisfactory for several reasons. In the case of cardboard, there is a serious drawback from the standpoint of structural strength. Thus, conditions which result in the application of particularly high forces will cause the cardboard to collapse and thus subject the packaged object to conditions which will cause it to break. In addition, prior art spacers have been unsatisfactory since they are in many cases difficult to attach to the object to be packaged. In some cases, this is due to the design of the spacer and in other cases, it is due to the necessity for applying the spacers whereby virtually all edges of the object are covered. Naturally, where spacers of satisfactory structural strength are provided which cover substantially all edges of a mirror or the like, the cost of the spacers become prohibitive.

It is an object of this invention to provide a novel packaging arrangement for mirrors, plate glass, and other objects of a frangible character.

It is a more particular object of this invention to provide a packaging arrangement of the type described which involves the use of spacers adapted to be arranged around the edges of objects to be packaged.

It is a further object of this invention to provide spacers for use in packaging fragile objects which can be economically produced, which are extremely easy to attach to the objects, and which are possessed of highly suitable structural strength whereby protection for the objects can be achieved even under severe conditions.

These and other objects of this invention will appear

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hereinafter and for purposes of illustration but not of limitation, specific embodiments of this invention are shown in the accompanying drawing in which:

FIGURE 1 is a vertical elevational view, partly cut away, of a package for a frangible object embodying the features of this invention;

FIGURE 2 is a vertical cross-sectional view of the package of FIGURE 1;

FIGURE 3 is an enlarged fragmentary view in section taken about the line 3-3 of FIGURE 2;

FIGURE 4 is a cross-sectional view taken about the line 4-4 of FIGURE 3;

FIGURE 5 is an enlarged fragmentary view in section illustrating a further alternative form of the invention;

FIGURE 6 is an enlarged fragmentary view illustrating a corner of the package of FIGURE 1;

FIGURE 7 is a top view of a spacer design characterized by the features of this invention;

FIGURE 8 is a view illustrating the opposite end of the spacer of FIGURE 7;

FIGURE 9 is a side elevational view of a modified form of a spacer;

FIGURE 10 is a top view of the spacer of FIGURE 9;

FIGURE 11 is a bottom view of the spacer of FIGURE 9;

FIGURE 12 is a vertical sectional view of an additional spacer configuration;

FIGURE 13 is a top view of the spacer of FIGURE 12;

FIGURE 14 is a bottom view of the spacer of FIGURE 12; and

FIGURE 15 is a side elevational of an alternative form of the invention.

The spacer of this invention generally comprises an element which includes a base portion having a pair of integrally formed outwardly extending portions. The outwardly extending portions define a channel which is provided for receiving the edge of a mirror or similar object which is to be packaged with the use of the spacer. The spacer is formed of a molded plastic material, and with this arrangement, the outwardly extending portions are adapted to flex relative to each other so that the portions can be spread outwardly and located on the object to be protected. When pressure is released, the outwardly extending portions will firmly grip the mirror or other object whereby secure attachment can be achieved. This arrangement greatly simplifies the packaging operation since the spacers are extremely easy to attach. Furthermore, the spacers can be located at any point along the edge of an object and they can be appropriately spaced apart to provide maximum protection. The need for spacers along the entire extent of such edges is eliminated because of the ideal gripping function of the preferred forms of this invention.

The spacers can be designed to provide a plurality of channels for receiving the edge of an object, and with this arrangement, channels of different sizes can be molded into the spacers. This greatly increases the versatility of the spacers since a wider range of thicknesses can thus be accommodated.

A further important feature of the spacers of this invention relates to the provision of angular configurations whereby the spacers can be readily applied at the corners of the frangible objects. Mirrors and plate glass pieces are most susceptible to damage at the corners, and it is important to provide maximum protection in these areas. Since all of the features of this invention can be employed in spacers which are plastic molded, the spacers can be economically produced. Furthermore, the molding operations permit the use of a novel design which is characterized by lightness while maintaining completely adequate structural strength.

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FIGURE 1 of the accompanying drawings illustrates an assembly 10 which includes a cardboard package 12 housing a mirror 14. A plurality of spacers 16 are associated along the edges 18 of the mirror. The package is dimensioned whereby the outer edges of the spacer will engage the inner walls of the packages to eliminate any tendency toward shifting movement of the mirror within the package.

FIGURES 2 through 6 illustrate the manner in which the spacers receive the mirror edges. The spacers illustrated are cylindrical in cross section whereby the mirror is maintained in spaced apart relationship with respect to all walls of the package. Thus, the length of the spacer determines the spacing with respect to the narrow end walls while the diameter of the spacers determines the spacing with respect to the large side walls.

The spacer 16 shown in FIGURES 3, 4 and 6 comprises a molded plastic article which includes a base portion 20 and an engaging portion 22. The engaging portion is formed by means of four outwardly extending portions 24, these portions being integrally connected to the base portion 22. Channels 26 and 28 are defined in the portion 22 at right angles with respect to each other. The mirror 14 is located in the channel 28, and it will be noted that a snug relationship is achieved. The channel 26 is wider than the channel 28 to accommodate thicknesses beyond the width of the channel 28.

It will be noted that openings 30 are formed in each of the portions 24 while similar openings 32 and 34 are defined by the base portion 22. These openings are preferably formed by means of cores which are included in the molds for making the spacers. The use of this arrangement greatly decreases the amount of material which must be employed for making the spacers.

The construction of FIGURE 5 comprises a modified spacer including a base portion 33 and upstanding L-shaped members 35. Four of these L-shaped members are molded integrally with the base portion to provide channels 37 and 39. A mirror 14 can be readily included in one of these channels, and the L-shaped members combine flexibility and strength whereby the mirror can be resiliently held in position.

FIGURES 6, 7 and 8 illustrate a modified spacer 36 which is substantially similar to the spacer 16. In this case, however, the channel 38 includes a bottom wall which is formed by means of angularly and inwardly converging surfaces 40. The surfaces 40 are at right angles to each other in the embodiment shown whereby they correspond to the adjacent edges 42 which form a corner of the mirror 14 as shown in FIGURE 6. With the corners of the mirror seated on the surfaces 40 in the manner shown, forces applied to the package will be effectively dissipated over a much larger surface area than would be the case if the corner were in essentially point contact with a spacer. The arrangement of the spacer in the manner shown is extremely important with respect to providing an adequate package. It will be noted in this connection that the spacer 36 also includes a channel 44 which permits the use of the spacer along a flat side edge in the manner of the spacer 16.

In FIGURES 9, 10 and 11, there is shown a spacer 46 which includes a base portion 48 and an upper cylindrical portion 50 formed integrally with the base portion. The base portion defines openings 52 for reducing the weight of the element as indicated above. The use of the cylindrical portion 50 provides for substantial weight reduction and also increases the flexibility which is achieved between the portions 54 of the cylindrical section. It will be noted that the portions 54 are formed in the cylindrical section by means of slots 56 which are cut therein.

The slots 56 comprise keyhole configurations in accordance with one preferred form of the invention. The wider opening 58 defined at the base of the keyhole serves to improve the flexing character of the respective portions 54.

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FIGURES 12 through 14 illustrate an additional spacer 60 which comprises a base portion 62 and an upper cylindrical portion 64. The upper portion 64 includes keyhole slots 66 to provide the desired flexing movement between the outwardly extending portions 68.

The base portion 62 is essentially of the same character as the base portion of the spacer 46. It will be noted, however, that the channel defined in this spacer includes a bottom wall which is formed by means of angularly and inwardly converging surfaces 70. These surfaces function in the manner of the arrangement described with reference to the surfaces 40 of the spacer 36.

It will also be noted that the spacer 60 defines additional angular surfaces 72 along its lower end. These surfaces 72 are provided for proper interfitting of the spacer with respect to the inner walls of a package when the spacer is located at the corner of the package. The interfitting provided by this design decreases the likelihood of shifting movement in the construction.

The spacer 80 of FIGURE 15 defines a channel 82 which is formed by side walls which converge toward the entry end 86. The walls must be spread to apply the spacer and therefore the ends tend to "dig" into contact with the surface of a mirror for better gripping. The spacer 80 also defines more pronounced slanted end surfaces 88 to provide interfitting with the carton corners.

It will be appreciated that in referring to frangible objects, it is intended that objects other than mirrors and plate glass are covered. Thus, the spacers are clearly suitable for use in combination with any object which defines an edge about which the spacer can be attached. It is also clear that the concepts of the invention can be utilized in spacers for objects which define curved edges by simply accommodating the channels to such objects.

The use of plastic material is extremely important with respect to the advantageous results which are achieved with the spacers of this invention. The molded plastic is characterized by a degree of elasticity which provides a cushion action when stresses are introduced in a mirror or the like, as when a package is dropped or otherwise mishandled. Polyethylene and similar materials, which also have non-abrasive surfaces, display the desired elasticity.

The advantageous characteristics of this invention are best illustrated by demonstrations which have been made wherein the spacers are located at the corners of a mirror as illustrated by the spacers 36 in FIGURES 1 and 6. In ordinary circumstances, an unprotected mirror would crack if dropped whereby the corner hits directly onto a hard surface. Such breakage occurs even if an unprotected mirror is dropped a few inches or even a fraction of an inch. With the spacers of this invention, however, mirrors have been dropped through distances greater than 12 inches with the corner directly hitting concrete floor without breakage.

It has long been recognized that mirrors and similar constructions are most vulnerable to damage at the corners, and it will be appreciated that the use of spacers along the side edges of the frangible objects can in many cases be avoided. This is particularly true where there are no long spans between the ends of the objects.

The ability of the spacers to be resiliently carried on the mirrors is an extremely important consideration from the standpoint of packaging efficiency. The spacers are located in position prior to insertion of a mirror or the live into a package. The spacers and mirror can then be readily packaged without any need for holding the spacers by other means during handling. There is no need to fix the spacers in position within a package before insertion of a mirror as is the case with some prior art constructions. There is also no need to place spacers on a mirror after the mirror is placed in a package. Finally, the spacers are carried along with the mirror as it is removed from a package. The mirror is, therefore, protected from damage during such handling.

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The angular interior surface defined by the corner spacers is of primary importance since this arrangement causes the spacer to uniformly absorb the stresses which are introduced in case a package is dropped. Furthermore, this arrangement avoids the problem of the spacer slipping out of place during handling. As suggested by FIGURES 1 and 6, forces which are imparted to the spacer tend to push the spacer into better engagement rather than tending to push the spacer out of position.

The concepts of this invention include the provision of elements which may comprise multiple spacers. In addition, the spacers of this invention can be provided in any length which will permit proper fitting within a package. Thus, the length of the spacers is best determined by relating conventional mirror sizes or the sizes of other conventional objects with conventional package sizes.

It will be understood that various changes and modifications may be made in the elements described which provide the characteristics of this invention without departing from the spirit thereof particularly as defined in the following claims.

That which is claimed is:

1. Means for use in the packaging of frangible objects such as mirrors and glass whereby the objects will be protected against breakage when packages containing the objects are subjected to impact, said means comprising a body structure formed of plastic material, said body structure including side walls extending completely around the structure, an inner end wall, and an outer end wall, at least two slots defined by said side wall, said slots being situated in opposed relationship and extending from said inner end wall to a point intermediate the length of the body structure, and wherein the end walls of said body structure are each relieved by a plurality of openings extending inwardly of the body structure from the respective end walls, the openings in the respective end walls being separated by web means, said body structure having a substantial thickness in all cross-sectional directions whereby the body structure can be secured to an

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edge portion of one of said objects with the object being held in spaced apart substantial relationship with respect to the walls of the package containing the object.

2. A structure in accordance with claim 1 wherein said outer end wall defines tapered surfaces, and including a recess in the interior of said body structure extending toward said outer end wall whereby the corner of one of said objects can be received within the body structure, said tapered surfaces of said outer end wall being tapered at angles corresponding with the interior walls at a corner of said package containing said object whereby the tapered surfaces are adapted to fit against said interior walls.

3. A structure in accordance with claim 1 wherein the opposed portions of said side wall defining said slots are adapted to flex relative to each other for resilient attachment of the structure to said edge portion.

4. A structure in accordance with claim 1 wherein said body structure defines a cylindrical cross section.

5. A structure in accordance with claim 2 including a bottom wall defining the extent of said recess, said bottom wall being formed by two angularly disposed inwardly converging surfaces, said surfaces being held in engagement with respective edge portions of said object when the structure is attached at a corner of said object, said converging surfaces having substantially the same angular relationship as said tapered surfaces.

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