Dec. 25, 1951 R. E. PAIGE 2,580,043

COMBINATION CARTON AND WRAPPER FOR FRAGILE ARTICLES

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Fig. 1.

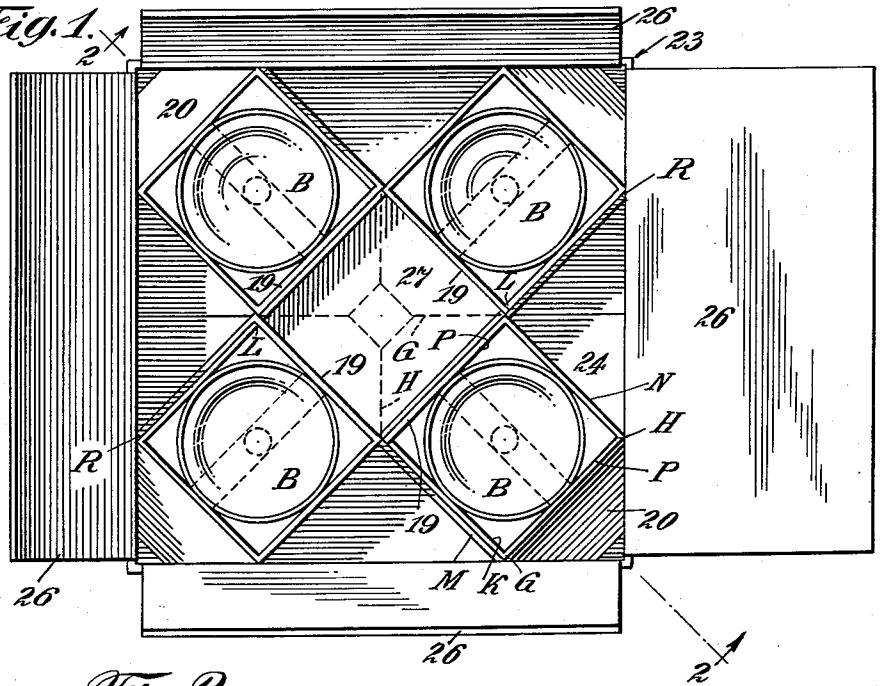
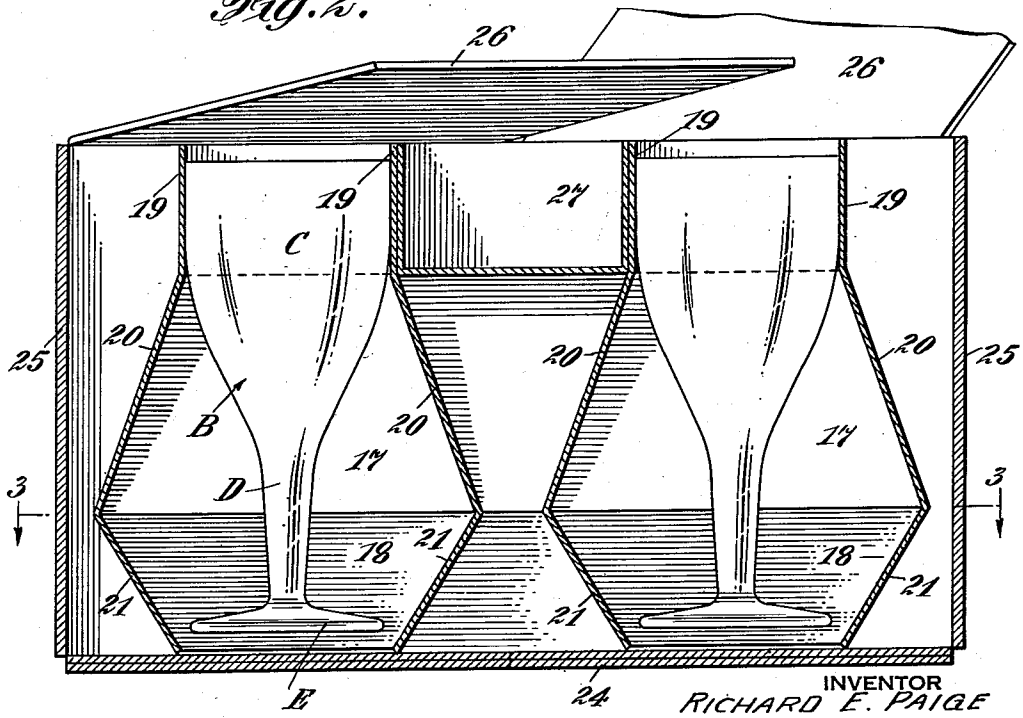


Fig. 2.



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Fig. 3.

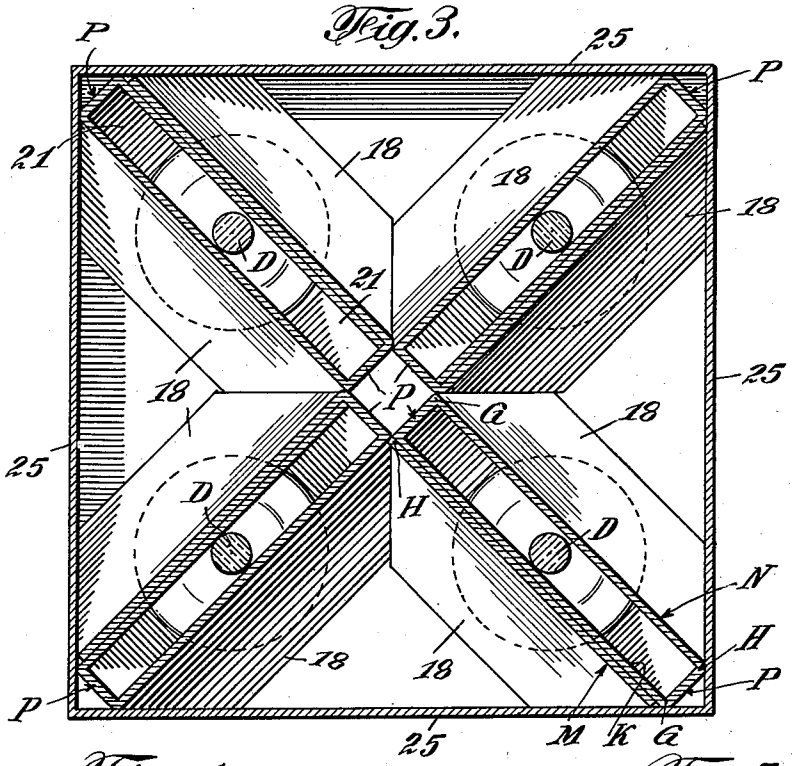


Fig. 4.

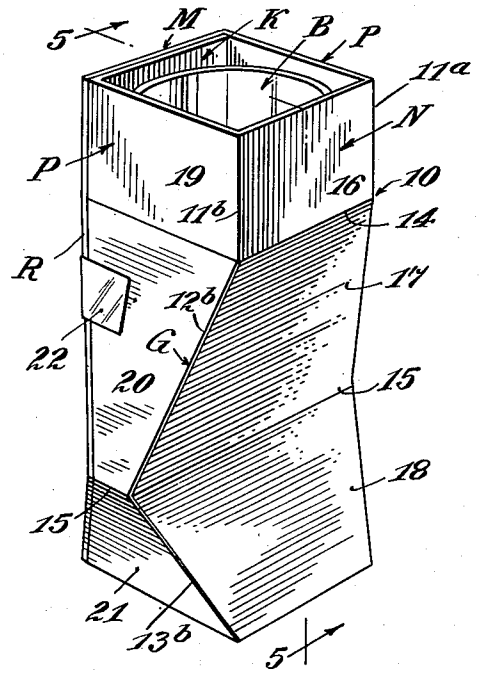
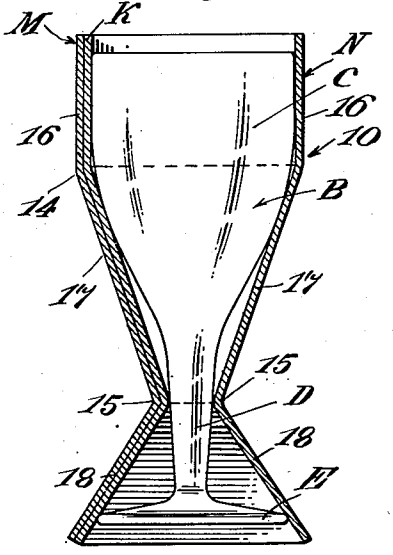


Fig. 5.



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Fig. 6.

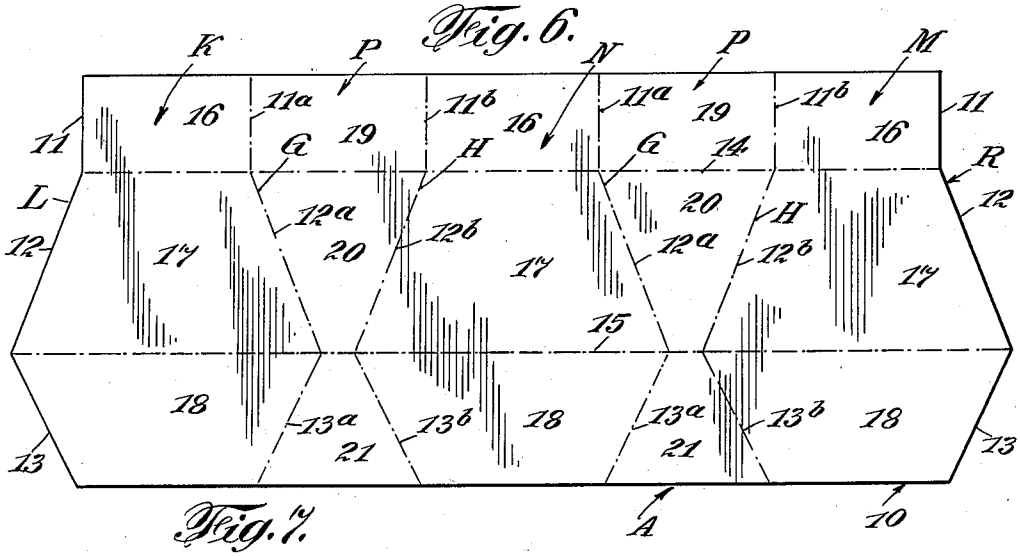


Fig. 7.

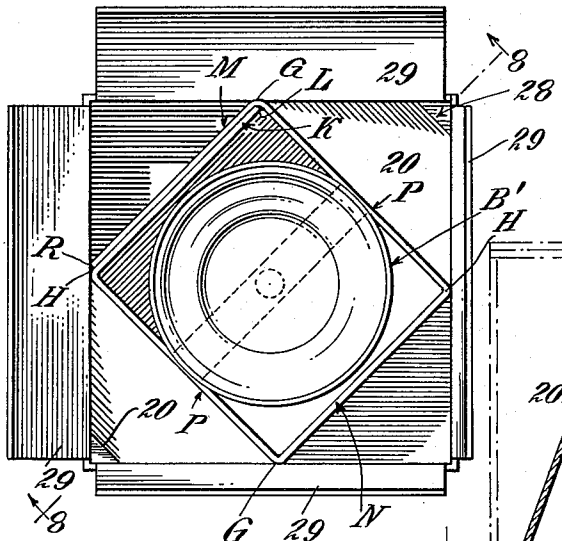
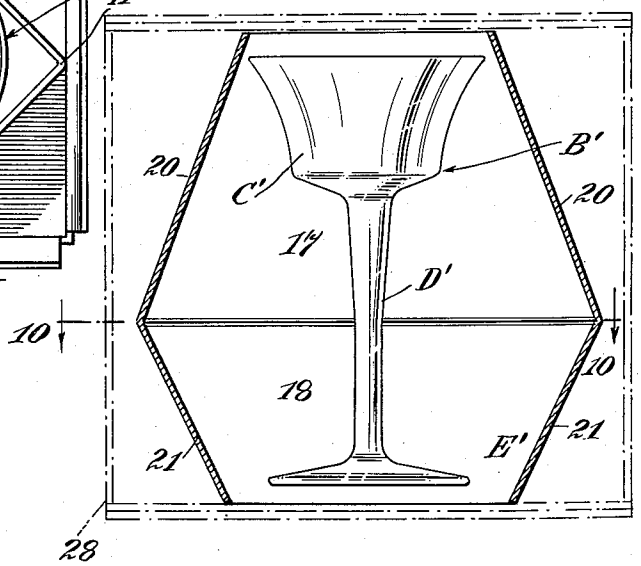


Fig. 8.



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COMBINATION CARTON AND WRAPPER FOR FRAGILE ARTICLES

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Fig. 9.

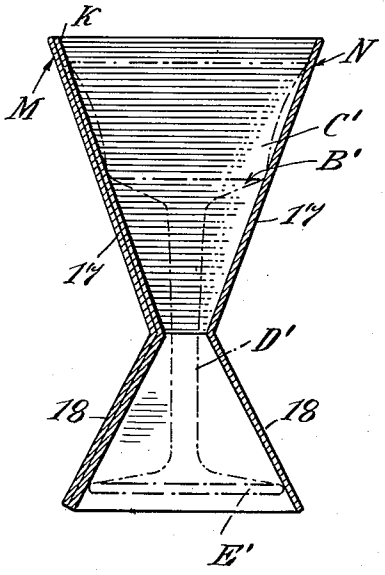


Fig. 10.

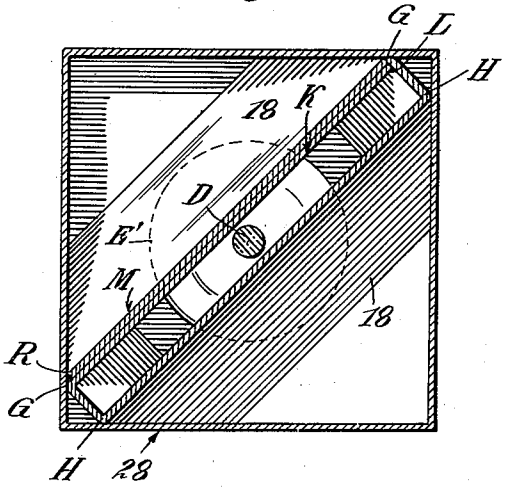
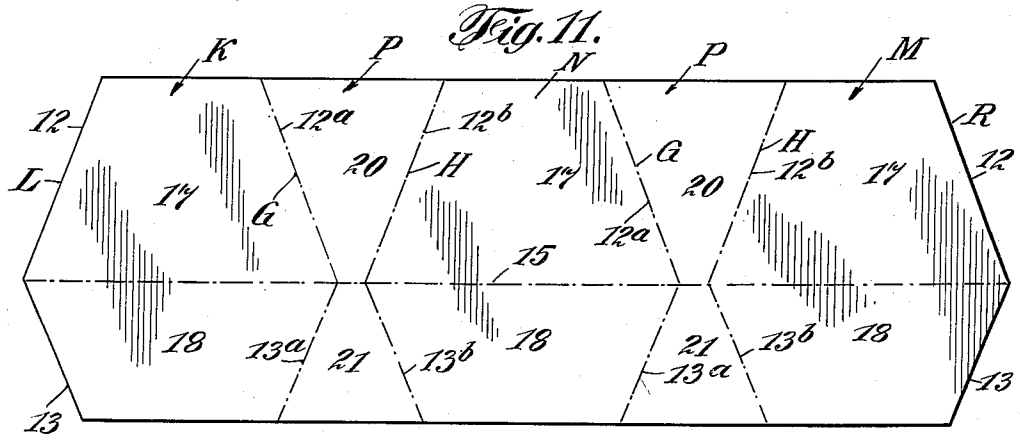


Fig. 11.



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UNITED STATES PATENT OFFICE

2,580,043

COMBINATION CARTON AND WRAPPER FOR FRAGILE ARTICLES

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Application January 12, 1946, Serial No. 640,806

5 Claims. (Cl. 229—14)

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This invention relates to improvements in shipping containers for fragile or irregular shaped articles.

In the past, it has been the practice to pack irregular-shaped articles for shipment by placing the article or articles in a regular square or rectangular carton and bracing the articles by inserting arbitrarily-shaped fillers, excelsior, or other cushioning materials between the flat walls of the carton and the irregular form of the merchandise to be packed. Such packing methods are both costly and time-consuming, and are usually of such a nature that if the merchandise is removed from the carton for inspection before sale, it is not always possible to re-pack it as it was originally packed. It is therefore one of the important features of this invention to provide an individual wrapper for the article which when folded therearound supports the article at different points for subsequent positioning within a carton in a novel manner to cause only corner edges of the folded wrapper to contact the walls of the carton. The article or articles so wrapped and positioned in a carton may be said to be "floating" and protected against breakage by shocks to which a package is subjected during shipment.

Another feature of the invention resides in a wrapper which is formed from a single blank of stiff cardboard, corrugated board or equivalent stiff foldable material, which is scored in a novel manner according to the irregular shape of the article which is to be packed. The blank is folded on the scores about the irregular shaped article and in spite of the fact that both ends of the folded wrapper now forming an irregular shaped sleeve are open, the article is firmly supported therein against accidental shifting movement laterally and endwise.

Another feature of the invention is the provision of a packaging wrapper foldable into unlimited shapes to accommodate the peculiar irregular outline of an article to be packed. To accomplish this unique result, the wrapper blank is provided with compensated scoring, that is, there will always be provided pairs of irregular score lines in opposed relation, which when the blank is folded thereon, shapes the wrapper between the score lines to the contour of the score lines irregularly. Adjoining panels of the wrapper so formed will always be opposite to each other in contour for one compensates for the other. For instance, if the surface of one panel of the wrapper is convex the next adjacent panel surface will be concave, or if considered in the category of angles, one panel will be disposed opposite that of an adjacent panel and at the same degree.

A further feature of the invention is to provide an article wrapper which is insertable into

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a square shaped carton diagonally in a direction from one corner to an opposed corner with the folded edges of the wrapper continuously engaging the side walls of the carton throughout the height of the wrapper whereby the wrapper is firmly held within the carton to protect the wrapped article from breakage due to shocks imparted to the carton during ordinary handling in shipment.

Other novel features of the invention will become apparent as the following specification is read in conjunction with the accompanying drawings, in which

Figure 1 is a top plan view of a carton with its top flaps open illustrating my invention as applied to the packaging of stem glassware or similar shaped articles.

Figure 2 is a vertical sectional view taken diagonally through the package on the line 2—2 of Figure 1.

Figure 3 is a horizontal sectional view on the line 3—3 of Figure 2.

Figure 4 is a perspective view of the wrapped articles removed from the packaging carton.

Figure 5 is a vertical sectional view on the line 5—5 of Figure 4.

Figure 6 is a plan view of one of the wrappers prior to folding.

Figure 7 is a top plan view of a carton with its top flaps open illustrating a single article packaged therein.

Figure 8 is a vertical diagonal sectional view taken on the line 8—8 of Figure 7 but showing the carton in dot and dash lines.

Figure 9 is a vertical sectional view of the wrapped article per se shown in Figure 7 but taken on a line at right angle to the line 8—8.

Figure 10 is a horizontal sectional view taken on the line 10—10 of Figure 8, the carton being shown in full lines.

Figure 11 is a plan view of the wrapper shown in Figures 7 to 10 prior to folding of the same.

Referring to the drawings by reference characters and at present to the form of the invention illustrated in Figures 1 to 6 inclusive, the numeral 10 designates an irregular shaped wrapper constructed in accordance with my invention. The wrapper 10 is formed from a single elongated blank A of stiff foldable cardboard, corrugated board or equivalent material as best illustrated in Figure 6. The blank A is of a height greater than the article to be wrapped therein and is of a length to entirely surround the article and have its ends overlapping for a distance equal to the side wall which they form when the blank is folded to set up position. The blank A is cut and scored in a manner to surround and support an article of glassware B in the shape of a stem type drinking glass. However, it will be understood that the article may

be of various irregular shapes and I do not wish to restrict my invention to the shape of the article shown. The glass B includes a body C which is the widest portion thereof, a stem D, and a flat annular base E.

The right and left end edges of the blank A are designated R and L. Each end edge R and L is provided with a vertical edge portion 11 extending downwardly from the top edge of the blank, a straight downwardly and outwardly inclined edge portion 12, and a straight downwardly and inwardly inclined edge portion 13. Spaced parallel horizontal score lines 14 and 15 extend the length of the blank. The ends of score line 14 meet the juncture of the edge portions 11 and 12. The ends of the score line 15 meet the juncture of the edge portions 12 and 13.

The blank A is further divided by suitably spaced diagonal score lines, four of which have been shown. These score lines are arranged in pairs and are identical in shape but are disposed in opposed relation. Each pair of diagonal score lines is designated G and H and extend from the bottom to the top edge of the blank. The two score lines G—G are parallel to the right end edge of the blank. The two scores H—H are parallel to the left end edge of the blank. Thus it will be understood that the score lines G and H are opposed to each other so that when the blank is folded on the score lines, said lines shape the material or panels therebetween to the corresponding contour.

The scoring of the blank A in the manner just described divides the same into a number of opposed infolding and compensating opposed outfolding side wall panels. In order to identify these panels I shall describe the score line portions which constitute each score line G and H.

Each score line G comprises irregularly related score line portions 11^a, 12^a, and 13^a which respectively parallel the edge portions 11, 12 and 13 of the right end edge R.

Each score line H comprises irregularly related score line portions 11^b, 12^b, and 13^b which respectively parallel the edge portions 11, 12 and 13 of the left end edge L.

The material of the blank bounded by end edge L and adjacent score G constitutes a folding side wall section K. The material between end edge R and adjacent score line H constitutes a folding side wall section M which is a companion wall section to the section K and overlaps the same when the blank is folded for use.

The material midway between the ends of the blank bounded by the intermediate score lines G and H constitutes a side wall section N similar in size and shape to the wall sections K and M and adapted to be opposed thereto when the blank is folded.

Disposed intermediate the wall sections K and N and between N and M are two identical wall sections P—P, the same being disposed opposite to each other when the blank is folded for use.

The side wall sections K, M, and N are identical and are divided by the horizontal score lines 14 and 15 into an upper rectangular shaped wall panel section 16, an intermediate panel section 17, and a lower panel section 18.

Each side wall section P is divided by the horizontal score lines 14 and 15 into an upper rectangular shaped wall panel section 19, an intermediate substantially V-shaped panel section 20, and a lower substantially inverted V-shaped panel section 21.

In order to fit the wrapper 10 about the glass B or other irregular shaped article to be packed for shipment, the blank A is folded on the parallel score lines 14 and 15 and upon the shaped score lines G—G and H—H into substantially tubular form as shown in Figure 4. After initially folding the blank A to this tubular form, the same is partially opened to fit the wrapper about the glass B whereupon the wall sections M and K are brought into overlapped relation and secured together by a strip of glue tape 22 which overlies the free end edge R of wall section M and the panel 17 of said wall section and panel 20 of adjacent wall section P. When the wrapper 10 is in its final folded and secured position about the glass B as shown in Figure 4, it assumes an irregular shaped appearance in which the opposed walls are of similar form, however, two opposed wall sections are reversely shaped relative to the other two opposed wall sections by reason of the compensated scoring hereinbefore explained. All of the panel sections 16 and 19 assume a vertical position. Each pair of related panel sections 20 and 21 of opposed wall sections P—P assumes a position in outwardly converging relation meeting at the score 15 which constitutes an apex. Thus the portions of the wall sections P—P below the panels 19—19 bulge outwardly.

In order to compensate for the outward bulging of the opposed wall sections P—P, it is necessary for the two opposed side wall sections N—MK to have portions which correspondingly bulge inwardly toward each other. Thus the panel sections 17 and 18 of each of the side wall sections N—MK assume a position in inwardly converging relation which meet at the score line 15.

By reference to Figure 5 it will be seen that the top end of the glass B is engaged by the vertical panel sections 16 and 19. The lower body portion of the glass is engaged by the opposed downwardly converging panel sections 17—17 inwardly of their free ends, while the edge of the base E of the glass is engaged by the opposed downwardly diverging panel sections 18—18. The constricted portion of the wrapper between panel sections 17 and 18 along the fold line 15 engages the stem D of the glass. The glass B is now surrounded by the wrapper 10 in a manner which prevents shifting of the glass endwise or sidewise relative to the wrapper and is protected by the wrapper against breakage by shocks which might be imparted to the wrapped article during handling or shipment.

In Figures 1, 2 and 3 I have illustrated a novel method in which a plurality of wrapped units such as shown in Figure 4 may be packed in a conventional cardboard or corrugated board carton 23. The carton 23 is square in plan and includes a bottom wall 24, four side walls 25, and opposed sets of folding top flaps 26—26. Four wrapped units are shown as being packed in the carton 23 but by making the carton deeper, additional wrapped units may be packed in a single carton by arranging them in tiers with a dividing partition therebetween. Four wrapped units are illustrated within the carton, one fitted diagonally into each corner of the carton with the score lines G and H facing the corner and being in engagement with the side walls 25—25 adjacent said corner. The folded edges formed by scores G and H opposite to those engaging the side walls of the carton, engage corresponding fold edges on adjacent wrapped units as

shown in dotted lines in Figure 1. These irregular meeting edges of adjacent wrapped units engage throughout their lengths, thus causing the wrapped units to be firmly nested within the body of the carton against shifting movement relative to each other. A U-shaped cardboard filler member 27 snugly fits into the space between the inwardly facing vertical wall panels 19 to brace the upper portions of the four wrapped units. The filler member 27 is limited in its insertion by the opposed outwardly bulging sets of panels 20—20. After the wrapped units have been fitted into the carton 23 in the manner explained, the top cover flaps 26 are folded inwardly and sealed in the conventional well known manner.

The wrapper is so shaped that the upper sections 16 are all of the same width and when the wrapper is folded these sections give it a square form at the top, as fully indicated in Figure 4. The sections 17 and 18 increase in width toward the transverse score line 15, while the sections 20 and 21 decrease in width toward and score line 15. Hence the sides comprising sections 17 and 18 bulge inward and these sides are reentrant. On the other hand the two remaining sides comprising sections 20 and 21 bulge outward. The edge 12*a* and 12*b* in which the sections 20 intersect with the sections 17 make an angle respectively with the edges 13*a* and 13*b* in which the sections 18 intersect with the sections 21. These edges along the corners of the four sides consist in each case of a broken line made of parts 12*a* and 13*a* or 12*b* and 13*b*, which meet in the line 15, delineating an angle with its apex on said line. Hence each broken line at the edges or corners of the sides between the top sections 16 and the bottom determines a separate geometrical plane; and said four planes intersect each with two others at substantially right angles, enveloping the wrapper to define a space or figure of the same transverse rectangular or square shape as the inside of the container 28 that is shown in Figure 7. The upper sections 16, with the wrapper designed as shown, all make equal angles at both sides with the planes in question, and this fact is the reason why the wrapper will fit into the square box of Figure 7 snugly with the edges 12*a*, 12*b*, 13*a* and 13*b*, making contact throughout the length thereof with the inside faces of the sides of this carton at the middle of said sides. Of course the parts 16 could be so designed that the top is more of a rectangle than a square. The construction is of course the same when the upper sections 16 are omitted, as in Figure 8; because, with such a construction the side edges 12*a* and 13*a*, 12*b* and 13*b*, determine planes which have the same relative locations as before and enable this wrapper to fit snugly the inside of a container 28.

In Figures 7 to 11 inclusive, I have illustrated my invention applied to the packaging of a single article within an individual container. The foldable blank from which the wrapper is constructed is identical with the blank A except that the portion of blank A above the score line 14 has been eliminated, thus the upstanding panels 16 and 19 are dispensed with. In view of the fact that the scoring and folding of the blank is the same as that of the blank A in Figure 6, like reference characters refer to corresponding parts in Figures 7 to 11.

The article enclosed in the wrapper in Figures 7 to 10 inclusive is in the shape of a cocktail glass designated B' and includes a body C', the rim of which is the widest portion of the glass, a stem D' and a flat annular base E'. When the glass B' is enclosed in its wrapper, it will be seen by reference to Figure 8 that the rim engages the opposed downwardly diverging panels 20—20, and also by reference to Figure 9 it will be seen that not only the rim of the glass contacts not only said panels 20—20 but also the opposed downwardly converging panels 17—17. The panels 17—17 are also engaged by the lower portion of the body C' of the glass while the base E' engages the opposed upwardly converging panels 18—18, while the meeting portions of the panels 17 and 18 at the fold formed by score line 15 are disposed in close proximity to the stem D'. The glass B' is cushioningly supported in the wrapper against vertical or lateral sliding movement.

The wrapped glass B' is inserted into an individual square carton 28 through the top thereof when the closure flaps 29 are in open swung back position. The wrapped glass B' is inserted diagonally into the carton 28 so that all of the corners formed by the score lines G—G and H—H respectively contact the four side walls of the carton throughout their lengths as best illustrated in Figures 1 and 10. Thus instead of only two corner edges contacting the walls of the carton as shown in Figures 1 and 3 all four irregular corner edges engage the respective four walls of the carton.

From the foregoing description taken in connection with the accompanying drawings, it will be understood that the irregular shaped article, a glass in this instance, is surrounded by a wrapper which in vertical section substantially conforms to the general contour of the article but in straight lines disposed in angular relation. Thus, the related panels do not fit the identical shape of the article but support it in many places to prevent vertical and lateral shifting of the article enclosed in what may be termed a specially shaped open ended sleeve. The article cannot be inserted into the wrapper after folding but must have the wrapper folded therearound. In all instances, adjoining panels of the folded wrapper will always be opposite to each other in contour, for if one panel is convex or projecting, the next must be concave or reentrant. Certain opposed side walls of the folded wrapper extend away from the article which it houses, thereby bracing the sleeve-like wrapper against the wall of the shipping carton. The article housed in the folded wrapper is suspended therein in spaced relation to the walls of the carton so that in the event of damage done to the carton during handling and shipment it will not be conveyed to the article. This feature also enables the wrapper to absorb shock and thereby prevent accidental damage to the wrapped article.

The folded wrapper is materially strengthened by reason of the overlapping end panel sections M and K, and the fact that the free edge L of the panel section K coincides with the adjacent panel section P.

If desired, a plurality of folded wrappers 16 containing articles to be shipped may be inserted into the respective square cells of a carton having vertical crossed partitions. In such instances the wrappers are inserted into the respective cells in the same manner as they are inserted in a separate carton shown in Figure 7.

Throughout the specification and also in the appended claims I have referred to the opposed pairs of side walls of the folded wrapper as being "concave" and "convex." Such terms are used to cover both curves and angles, for it will be ap-

preciated that the irregular shaped portions of the side walls of the wrapper may be formed by straight or curved line scoring of the blank from which the wrapper is formed.

In my own previous Patent No. 2,050,894, dated August 16, 1936, I have shown a form of scoring known as compensated scoring, in which pairs of matched irregular lines are folded in a manner identical to the present invention. The prior invention covered a basic principle of folding sheet material. The prior patent of Marshall I. Williamson No. 2,067,998, covered a method of collapsing compensated forms thereby making them capable of being glued automatically by standard folding-box gluing machines. Neither invention teaches a method of making a rigid corrugated wrapper requiring no pasting. The compensated forms achieved by the two above-mentioned patents were made as decorative containers into which merchandise could be inserted after the box is set up, and said merchandise could be removed without affecting the box. In the present invention, compensated forms are used to wrap around and hold firmly the merchandise placed within it, and said merchandise can only be removed by opening the wrapper. The lay-out of the folding are put to a new use in the bracing of the article within it by its various concave and convex surfaces. While the illustrations in this application show the use of compensated wrappers on drinking goblets only, such wrappers lend themselves to the packing of electric fans, glass coffee makers, radio tubes, and countless other fragile articles.

While I have shown and described what I consider to be the preferred embodiments of my invention, I wish it to be understood that such changes in construction, material, and design as come within the scope of the appended claims may be resorted to if desired without departing from the spirit of my invention as set forth in the claims hereunto annexed.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent, is:

1. A packing for articles having portions reduced in size between ends, comprising tubular wrappers each with alternating indented and bulging sides, the indented sides of each wrapper being separated by a narrow space for containing the reduced portion of said article therein, the indented and bulging sides intersecting in lines having portions extending in different directions towards the opposite lateral edges of the wrapper and lying in planes extending at right angles to one another when said wrapper is attached to said article, and a receptacle having square corners containing said wrappers with the articles therein, said wrappers being in diagonal positions, each wrapper having one of its bulging sides at the center of the receptacle, the wrappers being in contact at said center, and the opposite bulging side making contact with the inside of the receptacle at the corners thereof.

2. A packing for articles having portions reduced in size between ends, comprising tubular wrappers each with alternating indented and bulging sides, the indented sides comprising panels intersecting along a transverse line and being widest at said line, the bulging sides comprising panels also intersecting along a transverse line and being narrowest at said line, the indented sides of each wrapper being separated by a narrow space for containing the reduced portion of said article therein, the indented and bulging sides intersecting in lines having portions extending in different directions towards the opposite lateral edges of the wrapper and lying in planes extending at right angles to one another when said wrapper is attached to said article, and a receptacle having square corners containing said wrappers with the articles therein, said wrappers being in diagonal positions, each wrapper having one of its bulging sides at the center of the receptacle, the wrappers being in contact at said center, and the opposite bulging side making contact with the inside of the receptacle at the corners thereof.

3. The wrapper according to claim 1 wherein the indented walls are narrowest adjacent the ends of said article and the bulging walls are widest adjacent said ends.

4. A packing for articles having portions reduced in size between ends, comprising a tubular wrapper with alternating indented and bulging sides, the indented sides being separated by a narrow space for containing the reduced portion of said article therein, the indented and bulging sides intersecting in lines having portions extending in different directions towards the opposite lateral edges of the wrapper and lying in planes extending at right angles to one another when said wrapper is attached to said article, and a receptacle having square corners to receive said wrapper with the article therein, said wrapper being in diagonal position and having the edges of one of its bulging sides making contact with sides of the receptacle at a corner thereof.

5. A packing for article having portions reduced in size between ends, comprising a tubular wrapper with alternating indented and bulging sides, the indented sides comprising panels intersecting along a transverse line and being widest at said line, the bulging sides comprising panels also intersecting along a transverse line and being narrowest at said line, the indented sides of each wrapper being separated by a narrow space for containing the reduced portion of said article therein, the indented and bulging sides intersecting in lines having portions extending in different directions towards the opposite lateral edges of the wrapper and lying in planes extending at right angles to one another when said wrapper is attached to said article, and a receptacle having square corners to receive said wrapper with the article therein, the wrapper having one of its bulging sides making contact with the inside of the receptacle at a corner thereof.

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