Sept 10, 1957 J. N. BUTZ 2,805,810

CORNER PACKING

Filed July 16, 1956 2 Sheets-Sheet 1

Fig:1.

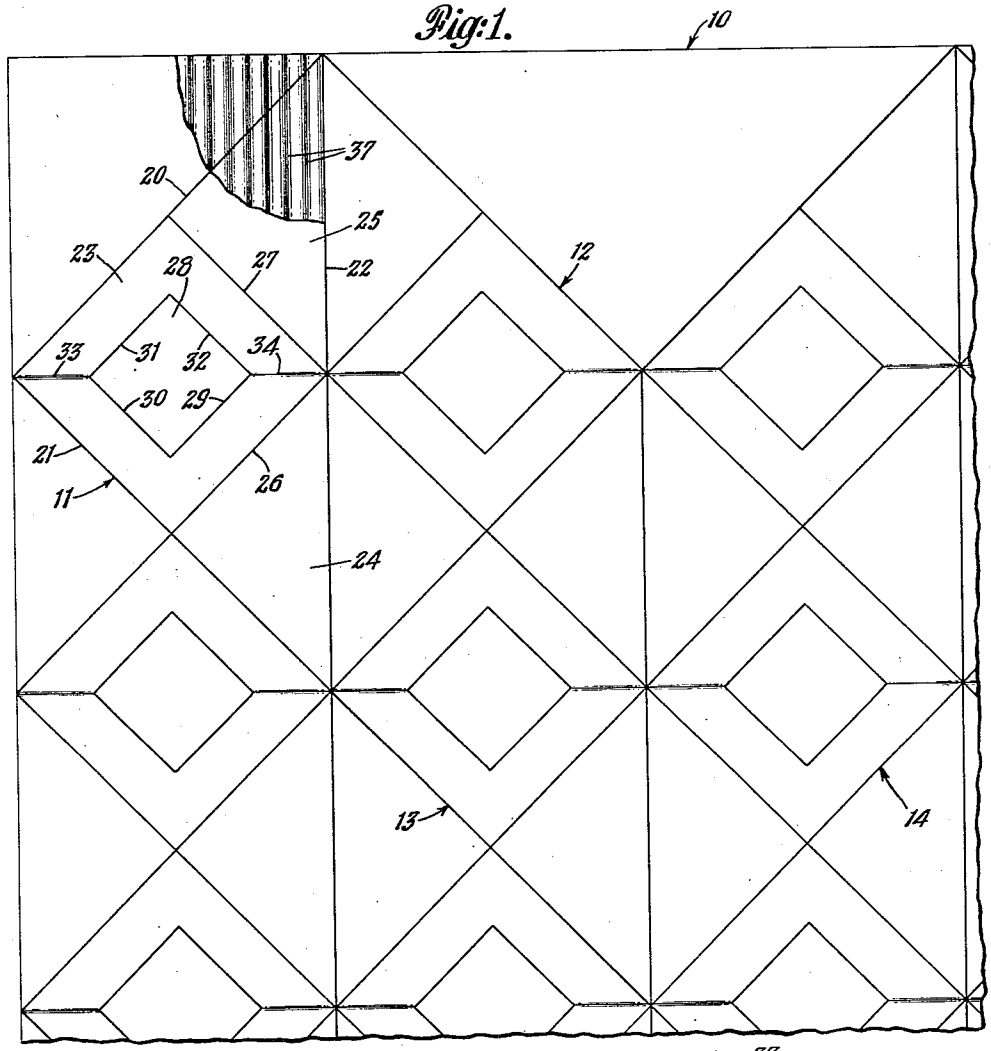


Fig:2.

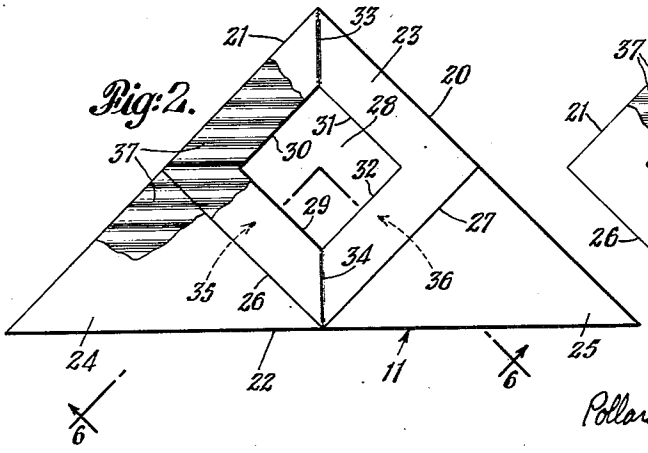
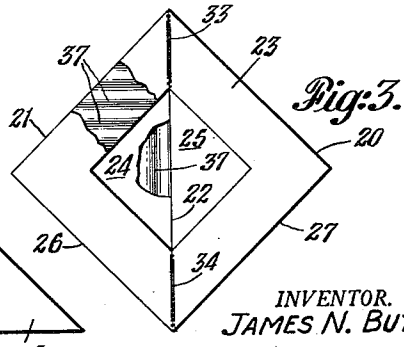


Fig:3.



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CORNER PACKING

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Fig:4.

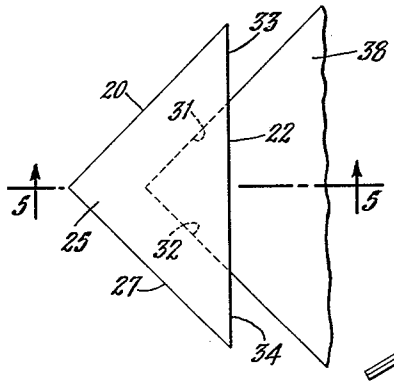


Fig:5.

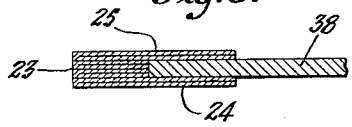


Fig:6.

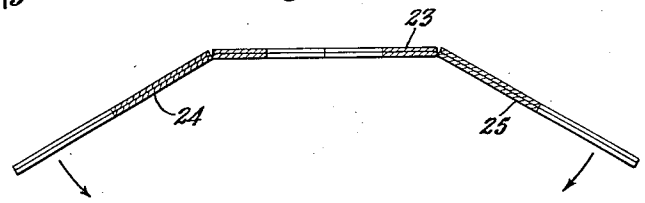


Fig:7.

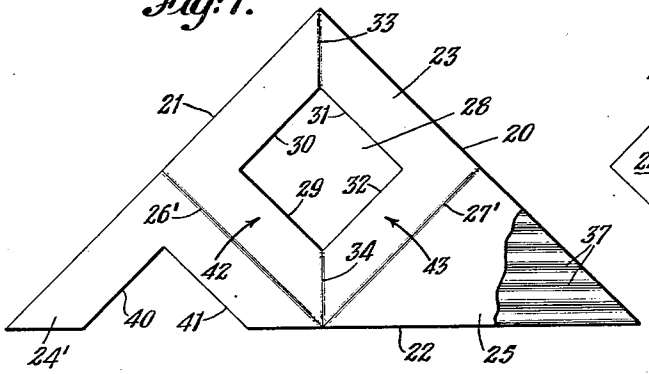


Fig:8.

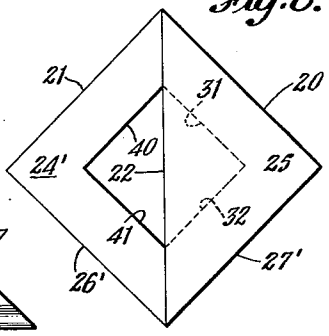


Fig:9.

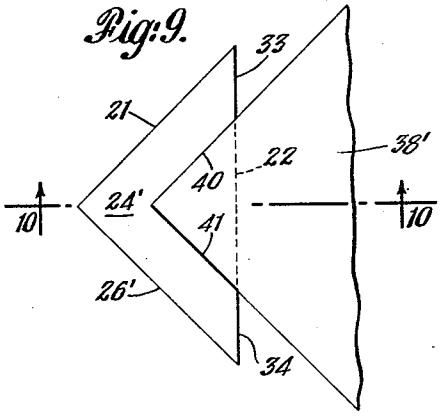
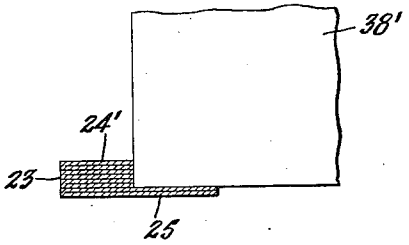


Fig:10.



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United States Patent Office 2,805,810 Patented Sept. 10, 1957

2,805,810

CORNER PACKING

James N. Butz, Detroit, Mich., assignor to Continental Can Company, Inc., a corporation of New York

Application July 16, 1956, Serial No. 597,987

8 Claims. (Cl. 229—14)

This invention relates to the packaging arts, and more particularly to an improved corner packing for use in a shipping container, and the like.

In the packaging of heavy articles for shipment, it is customary to provide a cushioning space between the article to be shipped and the walls of the shipping container. This cushioning space serves to protect the article being shipped from damage during transit and also serves to position the article in the container. Where several articles are to be packed in a single shipping container, it is usual to package them separately and to provide suitable cushioning pads or packing material between the packed articles themselves and between the articles and the container walls.

For example, when a fluorescent lighting fixture is shipped, the plate glass portion is packaged separately from the fixture itself and both of them then are included in a common outer shipping container. Consequently, the packed glass must be kept spaced from the upright walls of the container and must also be separated from the packed fixture by suitable packing or cushioning material. The fluorescent lighting fixture itself, must also be spaced from the upright walls of the shipping container and from the packed glass enclosed therein. The use of "loose" packing such as straw, or shredded paper, has proven somewhat unsatisfactory for this purpose, since it tends to shift in position during transit and may therefore provide a lesser cushioning or protecting action at some places on the packed articles, than others, thus increasing the likelihood of breakage.

To overcome this difficulty, corner packings or "corner pads" have been developed which are constructed of solid or corrugated fiberboard and which are located in the corners of the shipping container in such manner as to position and support the packed articles. The corner packings are customarily fabricated by cutting them out from large sheets of corrugated board material upon which have been laid out a plurality of blanks. The shape of the blank cut from a sheet of board material determines in large part the cost of manufacture, since it governs the number of usable blanks which may be obtained from a single sheet. It is therefore apparent that a suitable design for a corner packing depends upon manufacturing considerations as well as ultimate performance.

Accordingly, it is an object of this invention to provide a blank for a container corner packing which employs a minimum of material and which may be fabricated from large sheets of material with little waste.

It is a further object of this invention to provide a blank for a container corner packing which in use adds great strength to the corners of the container and which firmly positions and supports the packed article.

Briefly, the invention contemplates a blank for a container corner packing and the like, which comprises a section of flat sheet material, such as corrugated board, having the shape of a right angled isosceles triangle.

The triangular section is divided into first and second panels by first and second fold lines, each of which join the midpoint of the hypotenuse of said section with one of the midpoints of the legs of the section. The section is further divided into third and fourth panels by a third fold line which joins the midpoint of said hypotenuse with the apex of the right angle of said section. The third and fourth panels form a square central panel having an aperture located therein which is placed symmetrically about said third fold line separating the panels.

The blank thus formed is adapted to be reversely folded along said first, second and third fold lines to form a corner packing having said first and second panels as its outer members and said third and fourth panels as its inner members. When the blank is in its folded position, the edges of the aforesaid aperture cooperate with the first and second panels to form an article engaging portion of the corner packing, and the outer edges of the third and fourth panels opposite the third fold line cooperate with the adjacent edges of said first and second panels to form a container corner engaging portion of the packing.

In one embodiment of the invention, which is especially suited for the packaging of thin flat articles such as sheets of glass, the first and second panels are of the same size and have the shape of a right angled isosceles triangle. The first and second panels in the folded blank, thus forming separating and cushioning pads between the packed article and other articles which may be included in the same outer shipping container.

In another embodiment of the invention, the first panel has the shape of a right angled isosceles triangle and the second panel has substantially the shape of a right angled isosceles triangle, but with a cut-out portion located along the hypotenuse thereof. When the blank is folded, the edges of the cut-out portion and the edges of the aperture overlie each other and cooperate with the first panel to form an article engaging portion of the packing. The first panel only, in this arrangement, serves to separate the packed article from other articles in the same container. Accordingly, this embodiment of the invention is suitable for articles of substantial thickness or height such as the aforementioned fluorescent lighting fixture.

When flat corrugated board is employed for the blank, the hypotenuse of the triangular section is arranged to be parallel to the corrugations of the board. This permits the longitudinal axes of the corrugations of the third and fourth panels, in the folded blank, to be parallel to a line bisecting the angle formed by the container corner engaging portion of the corner packing, thus adding great strength to the corners of the container. The corrugations of the first and second panels, in the folded blank, are perpendicular to the corrugations of the third and fourth panels, thereby permitting the first and second panels to function as separating and cushioning members between the packed articles.

These and other objects, advantages, and features of the invention will become apparent from the following description and drawings which are merely exemplary.

In the drawings:

Fig. 1 is a top plan view of a portion of a sheet of double-wall corrugated board material having a plurality of blanks laid out thereon in accordance with one embodiment of the invention, a section of the outer flat liner of the corrugated board material being broken away to show the direction of the corrugations of the corrugated members;

Fig. 2 is a top plan view of one of the blanks shown in Fig. 1 with a section of the outer flat liner being broken away to show the direction of the corrugations;

Fig. 3 illustrates the blank of Fig. 2 in a partially folded position, with sections of the outer flat liner being broken away to show the relative directions of the corrugations of the panels;

Fig. 4 shows the blank of Fig. 2 in a completely folded position wherein it forms a corner packing for receiving one corner of a packed article, the packed article being partially shown;

Fig. 5 is a sectional view taken along the line **5—5** of Fig. 4;

Fig. 6 is a sectional view taken along the line **6—6** of Fig. 2 showing the direction of folding of the first and second panels of the blank;

Fig. 7 is a top plan view of a blank constituting another embodiment of the invention;

Fig. 8 illustrates the blank of Fig. 7 in a partially folded position;

Fig. 9 shows the blank of Fig. 7 in a completely folded position, wherein it forms a corner packing for receiving one corner of a packed article, the packed article being partially shown; and

Fig. 10 is a sectional view taken along the line **10—10** of Fig. 9.

Referring first to Fig. 1 of the drawing, there is shown a sheet **10** of double-wall corrugated board material upon which has been formed a plurality of blanks **11**, **12**, **13** and **14**. While double-wall corrugated board material is employed in the illustration, it is to be understood that any suitable material such as solid board or double-faced corrugated board could also be utilized. Inasmuch as blanks **11—14** are identical in construction except for their respective locations on sheet **10**, the layout of blank **11** only, will be described.

As seen in Figs. 1 and 2 of the drawing, blank **11** comprises a section of sheet material having the overall shape of a right angled isosceles triangle. The section is bounded by lines **20** and **21** which are of equal length and form the legs of the triangle, and a line **22** forming the hypotenuse of the triangle. The triangular section of blank **11** is divided into a first panel **24** and a second panel **25** by fold lines **26** and **27** which join the midpoint of hypotenuse **22** with the midpoints of the legs **21** and **20**. In this embodiment of the invention, the first and second panels **24** and **25** are of the same size and have the shapes of right angled isosceles triangles bounded by lines **21**, **22** and **26** and **20**, **22** and **27**, respectively. The triangular section of blank **11** is further divided into third and fourth panels by fold line **33**, **34** which joins the midpoint of hypotenuse **22** with the apex of the right angle of the triangular section. In fabricating the blank from a large sheet of material, the fold line **33**, **34** would of course be made by a single scoring operation and hence may be accurately described as a single fold line.

It may be noted at this point, that the third and fourth panels form a square central panel **23** having an aperture **28** located therein. The aperture **28** should be symmetrically located about the fold line **33**, **34** so that the edges of the aperture on one side of the fold line overlie the edges of the aperture on the other side of the fold line when the blank is folded. In the illustrated embodiment of the invention, the aperture has a square configuration and has edges **29**, **30**, **31** and **32** which are parallel to the edges of the square central panel **23**. The edges **29—32** of the aperture are also equidistantly spaced from the edges of the square central panel. The blank thus far described, may accordingly be said to comprise a triangular section that is divided into first, second, third and fourth panels by first, second and third fold lines. As will be later explained, the first, second and third fold lines may comprise several suitable combinations of cut and score lines, but, as illustrated in Figs. 1 and 2 of the drawing, they comprise cut lines **26** and **27** and score line **33**, **34**, respectively.

When the blank **11** is folded along lines **26** and **27** in the direction of the arrows **35** and **36** of Figs. 1 and 6, it assumes the shape shown in Fig. 3, wherein the first and second panels **24** and **25** underlie the square central panel **23**.

At this point, it may be well to mentioned that if corrugated board material is employed for the blank, as shown in Figs. 1, 2 and 3, the corrugations **37** should be parallel to the edge **22** forming the hypotenuse of the blank. Thus, when the first fold step has been completed, the corrugations **37** of the first and second panels **24** and **25** are perpendicular to the corrugations of the square central panel **23** of the blank. This orientation of the corrugations of the panels is important for reasons which will appear hereinafter.

The blank is next folded upwardly along the fold line **33**, **34** so that the third and fourth panels forming the square central panel **23**, coengage each other. At the completion of this step, the blank has the apearance shown in Fig. 4 of the drawing. The edges **31** and **32** of the square aperture **28** now overlie the edges **30** and **29**, respectively, of the aperture and form with the first and second panels **24** and **25** an article engaging portion of the corner packing. As seen in Figs. 4 and 5 of the drawing, the article engaging portion so formed is adapted to receive one corner of a packed article **38**. The edges **20** and **27** of the square central panel **23** which are opposite fold line **33**, **34**, now overlie the corresponding edges **21** and **26**, respectively, and with the adjacent edges of the first and second panels form a container corner engaging portion of a thickness equal to four thicknesses of the corrugated board material employed.

The corner packing forming this embodiment of the invention is especially suited for the packaging of thin flat objects, such as panes of glass and the like, since the first and second panels **24** and **25**, forming its outer members, serve to separate and cushion the packed article from other articles in the same container. The inner members formed by the third and fourth panels, provide the structural strength necessary to keep the packed article away from the upright walls of the shipping container. Accordingly, the disclosed corner packing both positions and protects the packed article even though other articles are included in the same outer shipping container.

As hereinbefore mentioned, when corrugated board material is employed for the blank and the hypotenuse of the triangular section forming the blank is made parallel to the corrugations, the corrugations of the outer members of the folded blank will be perpendicular to the corrugations of the inner members. Furthermore, the longitudinal axes of the corrugations of the inner members of the packing will be parallel to a line bisecting the angle formed by the container corner engaging portion of the packing. Since the function of the inner members of the corner packing is to keep the packed article spaced from the upright walls of the container, it is apparent that the corrugations of these members are so aligned with respect to the corner of the shipping container as to afford maximum strength and protection. Inasmuch as the only function of the outer members of the corner packing is to separate and cushion the packed article from other articles, or from the ends of the shipping container, the direction of the corrugations therein is immaterial.

From the foregoing description, it is believed apparent that the shape of the aperture **28** located in square central panel **23** is governed by the shape of the packed article, since the edges of the aperture receive one corner of the article when the blank is folded to form a corner packing. The aperture illustrated, is of square configuration and would be adapted to receive rectangular articles or articles having right angled corners. Accordingly, packed articles having a shape other than rectangular could be accommodated by suitable alteration of the shape of the aperture, so that the edges of the aperture conform, when folded, to the corner of the article.

Returning now to Fig. 1 of the drawing, it is seen

that the blanks are laid out in a back-to-back relation on the sheet 10. Since each blank has the shape of a right angled isosceles triangle, it is apparent that two blanks laid out back-to-back will form a perfect square. Thus, if optimum performance of the corner packing is not needed, the direction of the corrugations may be ignored and the blanks may be laid out on a rectangular sheet of board material with no waste except that lost in forming the apertures 28. If optimum strength is required, the hypotenuse of the triangular section forming the blank must be made parallel to the corrugations, in which case the blanks are laid out as illustrated in Fig. 1. When the blanks are fabricated from the rectangular sheet 10 in this manner, the loss of material will still be small, and aside from the loss involved in forming the apertures 28, will consist only of small triangular sections at the top and bottom of the sheet.

In fabricating the blanks from the sheet 10, the fold lines 26, 27 and 33, 34 can be formed by several suitable combinations of cutting and scoring operations. For example, as shown in Fig. 1, the fold lines 26 and 27 may be cut lines and the fold line 33, 34 may be a score line. This arrangement has the advantage that all cutting and scoring operations are performed on one side of the sheet 10. It would be possible, however, to make the fold line 33, 34 a cut line located on the other side of the sheet, in which case, all the fold lines are produced by cutting operations. Similarly, fold lines 26 and 27 could be formed by score lines located on the other side of sheet 10, thereby producing all the fold lines by scoring operations.

Figs. 7–10 of the drawing illustrate another embodiment of the invention which comprises a blank for a corner packing that is especially adapted for packed articles of substantial thickness or height. For the sake of simplicity, the same reference characters are employed for parts which are common to both embodiments of the invention.

As seen in Fig. 7, the blank constituting this embodiment of the invention comprises a section of flat sheet material having the shape of a right angled isosceles triangle bounded by lines 20, 21 and 22. The triangular section is again divided into first, second, third and fourth panels by first, second and third fold lines. The first and second fold lines are shown as score lines 27' and 26' which define the first panel 25 and the second panel 24'. As in the embodiment of Figs. 1–6, the third fold line comprises score line 33, 34 which defines the third and fourth panels that form square central panel 23. The aperture 28 in panel 23 is again of square configuration and has edges 29—32 which are parallel to the edges of the square central panel.

The second panel 24' of this embodiment of the invention has substantially the shape of a right angled isosceles triangle and has a cut-out portion defined by edges 40 and 41 located along the hypotenuse of the panel. The edges 40 and 41 are so arranged as to overlie the edges 30 and 29, respectively, of the aperture 28, when the blank is folded in the direction of arrows 42 and 43. At the completion of this folding operation the blank has the appearance illustrated in Fig. 8. Like the embodiment of Figs. 1–6, the corrugations of panels 24' and 25 are perpendicular to the corrugations of the square central panel 23.

The final folding step consists of folding the blank along the fold line 33, 34 so that the third and fourth panels coengage each other to form the inner members of the corner packing and the first and second panels 25 and 24' form the outer members. As seen in Figs. 9 and 10 of the drawing, the edges 40 and 41 of the cut-out portion of panel 24' and the edges 29—32 of the aperture 28 cooperate with the first panel 25 to form an article engaging portion of the corner packing. Since the second panel 24' has a cut-out portion, the corner packing of this embodiment of the invention can accommodate a packed article 38' of considerable thickness or height, such as a fluorescent lighting fixture, and the like. The third and fourth panels, forming the inner members of the corner packing, again provide the structural strength which keeps the packed article 38' spaced from the upright walls of the shipping container. In this embodiment, however, only the first panel 25 serves to separate and cushion the packed article from other articles included in the same shipping container, or from the ends of the container. The second panel 24', being cut away to accommodate the height of the article packed, does not assist in this function.

The blanks comprising this embodiment of the invention would be laid out on a large sheet of suitable board material in the same manner as the blanks of Figs. 1–6, with the exception that a cut-out portion is formed in the second panel 24'. If the cut-out portion is right angled in shape, as would be the case where a square aperture 28 is employed, it is apparent that two blanks laid out in a back-to-back relation would have abutting second panels, with the result that a single square aperture would be formed by the two cut-out portions.

It should be aparent, however, that modifications may be made in the construction and arrangement of the disclosed blanks without departing from the spirit of the invention, except as defined in the appended claims.

I claim:

1. A blank for a container corner packing and the like, comprising a section of flat sheet material having the shape of a right angled isoceles triangle, said triangular section being divided into first and second panels by first and second fold lines each joining the midpoint of the hypotenuse of said section with one of the midpoints of the legs of said section and being further divided into third and fourth panels by a third fold line joining the midpoint of said hypotenuse with the apex of the right angle of said section, said third and fourth panels forming a square central panel having an aperture located symmetrically about said third fold line, the blank thus formed being adapted to be reversely folded along said first, second and third fold lines to form a corner packing having said first and second panels as its outer members and said third and fourth panels as its inner members, the edges of said aperture cooperating with said first and second panels to form an article engaging portion of said packing and the outer edges of said third and fourth panels opposite said third fold line cooperating with the adjacent edges of said first and second panels to form a container corner engaging portion of said packing.

2. A blank for a container corner packing and the like, comprising a section of flat corrugated board material having the shape of a right angled isosceles triangle wherein the hypotenuse is parallel to the corrugations of said board material, said triangular section being divided into first and second panels by first and second fold lines each joining the midpoint of said hypotenuse with one of the midpoints of the legs of said section and being further divided into third and fourth panels by a third fold line joining the midpoint of said hypotenuse with the apex of the right angle of said section, said third and fourth panels forming a square central panel having an aperture located symmetrically about said third fold line, the blank thus formed being adapted to be reversely folded along said first, second and third fold lines to form a corner packing having said first and second panels as its outer members and said third and fourth panels as its inner members, the edges of said aperture cooperating with said first and second panels to form an article engaging portion of said packing and the outer edges of said third and fourth panels opposite said third fold line cooperating with the adjacent edges of said first and second panels to form a container corner engaging portion of said packing, the corrugations of said inner members having their longitudinal axes parallel to a line bisecting the angle formed by said container corner engaging portion and the cor-

rugations of said outer members being perpendicular thereto.

3. A blank for a container corner packing and the like, comprising a section of flat sheet material having the shape of a right angled isosceles triangle, said triangular section being divided into first and second panels by first and second fold lines each joining the midpoint of the hypotenuse of said section with one of the midpoints of the legs of said section and being further divided into third and fourth panels by a third fold line joining the midpoint of said hypotenuse with the apex of the right angle of said section. said third and fourth panels forming a square central panel having a square aperture located therein, the edges of said aperture being parallel to the edges of said square central panel and spaced equidistantly therefrom, the blank thus formed being adapted to be reversely folded along said first, second and third fold lines to form a corner packing having said first and second panels as its outer members and said third and fourth panels as its inner members, the edges of said square aperture cooperating with said first and second panels to form an article engaging portion of said packing and the outer edges of said third and fourth panels opposite said third fold line cooperating with the adjacent edges of said first and second panels to form a container corner engaging portion of said packing.

4. A blank for a container corner packing and the like, comprising a section of flat corrugated board material having the shape of a right angled isosceles triangle wherein the hypotenuse is parallel to the corrugations of said board material, said triangular section being divided into first and second panels by first and second fold lines each joining the midpoint of said hypotenuse with one of the midpoints of the legs of said section and being further divided into third and fourth panels by a third fold line joining the midpoint of said hypotenuse with the apex of the right angle of said section, said third and fourth panels forming a square central panel having a square aperture located therein, the edges of said aperture being parallel to the edges of said square central panel and spaced equidistantly therefrom, the blank thus formed being adapted to be reversely folded along said first, second and third fold lines to form a corner packing having said first and second panels as its outer members and said third and fourth panels as its inner members, the edges of said square aperture cooperating with said first and second panels to form an article engaging portion of said packing and the outer edges of said third and fourth panels opposite said third fold line cooperating with the adjacent edges of said first and second panels to form a container corner engaging portion of said packing, the corrugations of said inner members having their longitudinal axes parallel to a line bisecting the angle formed by said container corner engaging portion and the corrugations of said outer members being perpendicular thereto.

5. A blank for a container corner packing and the like, comprising a section of flat sheet material having the shape of a right angled isosceles triangle, said triangular section being divided into first and second panels by first and second fold lines each joining the midpoint of the hypotenuse of said section with one of the midpoints of the legs of said section and being further divided into third and fourth panels by a third fold line joining the midpoint of said hypotenuse with the apex of the right angle of said section, said first and second panels each being of the same size and having the shape of a right angled isosceles triangle, said third and fourth panels forming a square central panel having an aperture located symmetrically about said third fold line, the blank thus formed being adapted to be reversely folded along said first, second and third fold lines to form a corner packing having said first and second panels as its outer members and said third and fourth panels as its inner members, the edges of said aperture cooperating with said first and second panels to form an article engaging portion of said packing and the outer edges of said third and fourth panels opposite said third fold line cooperating with the adjacent edges of said first and second panels to form a container corner engaging portion of said packing.

6. A blank for a container corner packing and the like, comprising a section of flat corrugated board material having the shape of a right angled isosceles triangle wherein the hypotenuse is parallel to the corrugations of said board material, said triangular section being divided into first and second panels by first and second fold lines each joining the midpoint of said hypotenuse with one of the midpoints of the legs of said section and being further divided into third and fourth panels by a third fold line joining the midpoint of said hypotenuse with the apex of the right angle of said section, said first and second panels each being of the same size and having the shape of a right angled isosceles triangle, said third and fourth panels forming a square central panel having a square aperture located therein, the edges of said aperture being parallel to the edges of said square central panel and spaced equidistantly therefrom, the blank thus formed being adapted to be reversely folded along said first, second and third fold lines to form a corner packing having said first and second panels as its outer members and said third and fourth panels as its inner members, the edges of said square aperture cooperating with said first and second panels to form an article engaging portion of said packing and the outer edges of said third and fourth panels opposite said third fold line cooperating with the adjacent edges of said first and second panels to form a container corner engaging portion of said packing, the corrugations of said inner members having their longitudinal axes parallel to a line bisecting the angle formed by said container corner engaging portion and the corrugations of said outer members being perpendicular thereto.

7. A blank for a container corner packing and the like, comprising a section of flat sheet material having the shape of a right angled isosceles triangle, said triangular section being divided into first and second panels by first and second fold lines each joining the midpoint of the hypotenuse of said section with one of the midpoints of the legs of said section and being further divided into third and fourth panels by a third fold line joining the midpoint of said hypotenuse with the apex of the right angle of said section, said first panel having the shape of a right angled isosceles triangle and said second panel having substantially the shape of a right angled isosceles triangle but with a cut-out portion located along the hypotenuse thereof, said third and fourth panels forming a square central panel having an aperture located symmetrically about said third fold line, the blank thus formed being adapted to be reversely folded along said first, second and third fold lines to form a corner packing having said first and second panels as its outer members and said third and fourth panels as its inner members, the edges of said cut-out portion and the edges of said aperture overlying each other when the panels of said blank are in their folded positions and cooperating with said first panel to form an article engaging portion of said packing, the outer edges of said third and fourth panels opposite said third fold line cooperating with the adjacent edges of said first and second panels to form a container corner engaging portion of said packing.

8. A blank for a container corner packing and the like, comprising a section of flat corrugated board material having the shape of a right angled isosceles triangle wherein the hypotenuse is parallel to the corrugations of said board material, said triangular section being divided into first and second panels by first and second fold lines each joining the midpoint of said hypotenuse with one of the midpoints of the legs of said section and being further divided into third and fourth panels by a third fold line joining the midpoint of said hypotenuse

with the apex of the right angle of said section, said first panel having the shape of a right angled isosceles triangle and said second panel having substantially the shape of a right angled isosceles triangle but with a right angled cut-out portion located along the hypotenuse thereof, said third and fourth panels forming a square central panel having a square aperture located therein, the edges of said aperture being parallel to the edges of said square central panel and spaced equidistantly therefrom, the blank thus formed being adapted to be reversely folded along said first, second and third fold lines to form a corner packing having said first and second panels as its outer members and said third and fourth panels as its inner members, the edges of said cut-out portion and the edges of said aperture overlying each other when the panels of said blank are in their folded positions and

cooperating with said first panel to form an article engaging portion of said packing, the outer edges of said third and fourth panels opposite said third fold line cooperating with the adjacent edges of said first and second panels to form a container corner engaging portion of said packing, the corrugations of said inner members having their longitudinal axes parallel to a line bisecting the angle formed by said container corner engaging portion and the corrugations of said outer members being perpendicular thereto.

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