

Aug. 15, 1967

E. BROWN

3,335,932

CUSHION PAD FOR PACKING BREAKABLE PLATE-LIKE ARTICLES

Filed Nov. 24, 1964

4 Sheets-Sheet 1

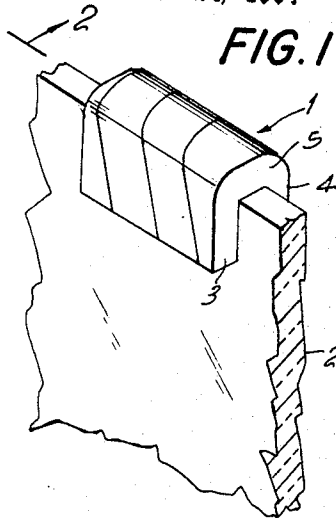


FIG. 1

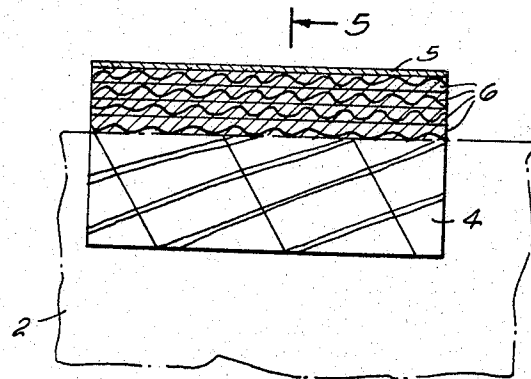


FIG. 2



FIG. 3

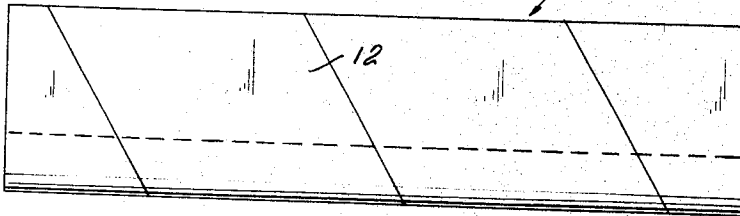


FIG. 4

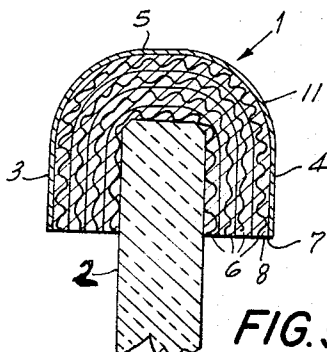
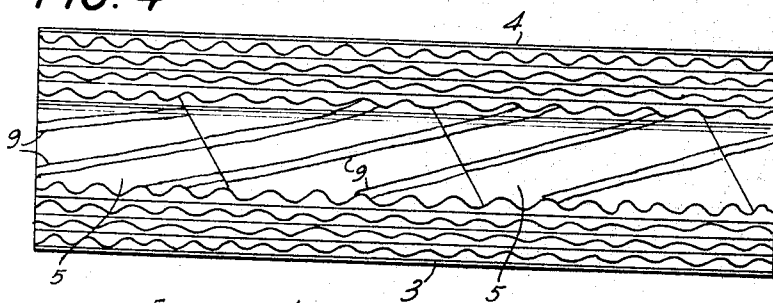


FIG. 5

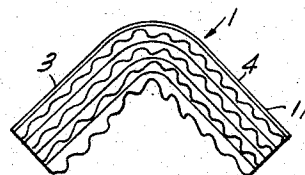


FIG. 6

INVENTOR
ERIK BROWN

BY

Pennie, Edmonds, Morton, Taylor & Adams
ATTORNEYS

Aug. 15, 1967

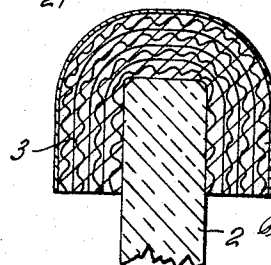
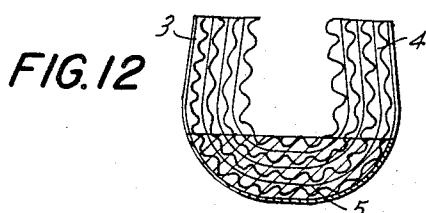
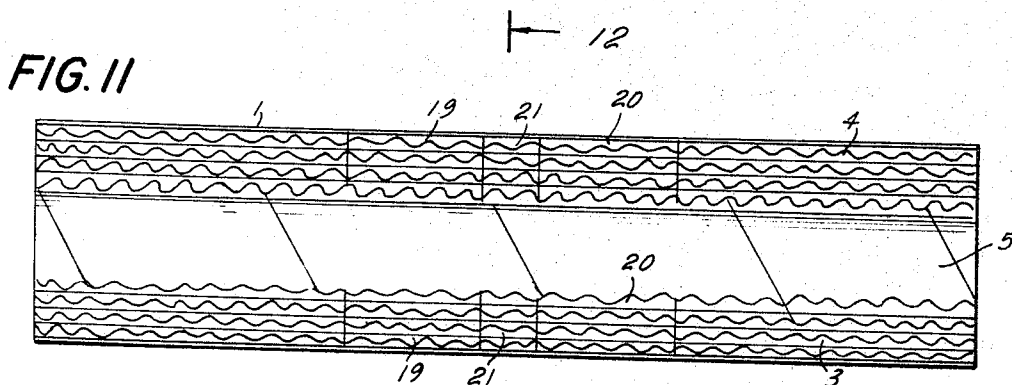
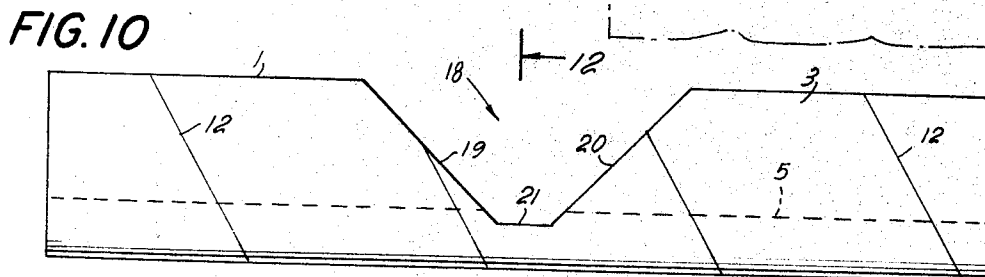
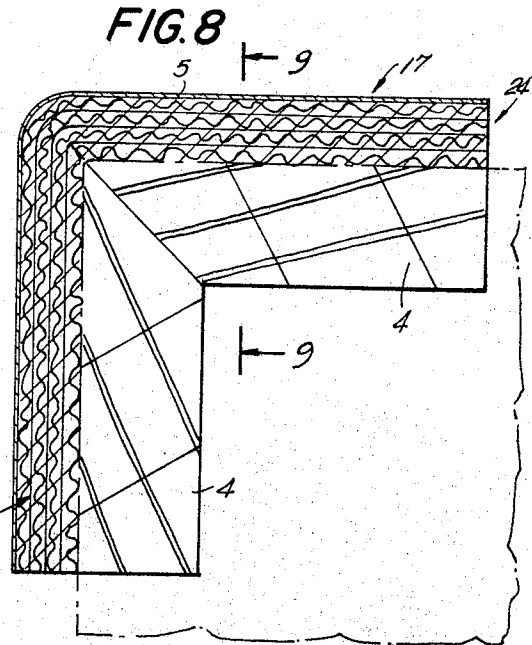
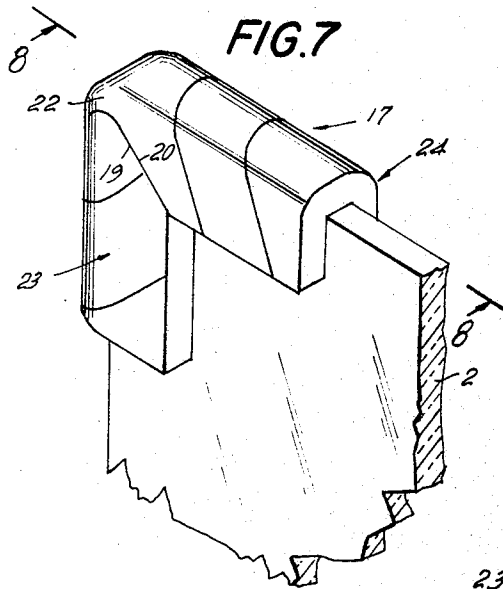
E. BROWN

3,335,932

CUSHION PAD FOR PACKING BREAKABLE PLATE-LIKE ARTICLES

Filed Nov. 24, 1964

4 Sheets-Sheet 2



INVENTOR
ERIK BROWN

BY

Bennis, Edwards, Winton, Taylor & Adams
ATTORNEYS

Aug. 15, 1967

E. BROWN

3,335,932

CUSHION PAD FOR PACKING BREAKABLE PLATE-LIKE ARTICLES

Filed Nov. 24, 1964

4 Sheets-Sheet 3

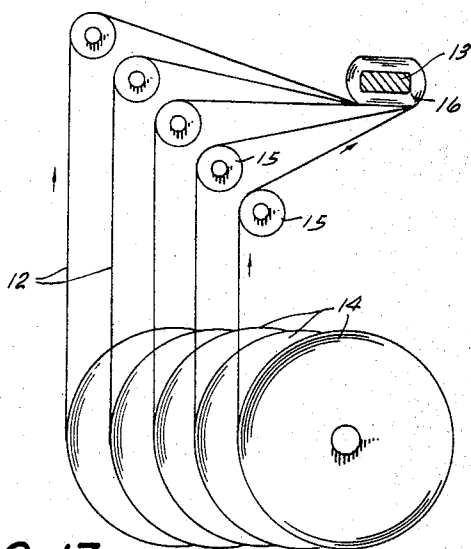


FIG. 13

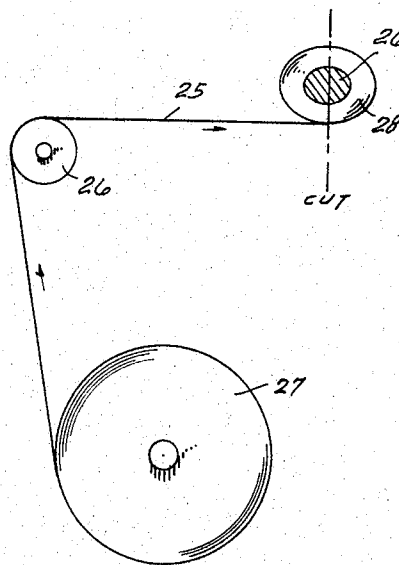


FIG. 15

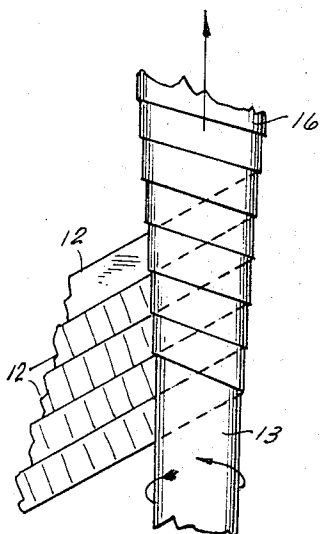


FIG. 14

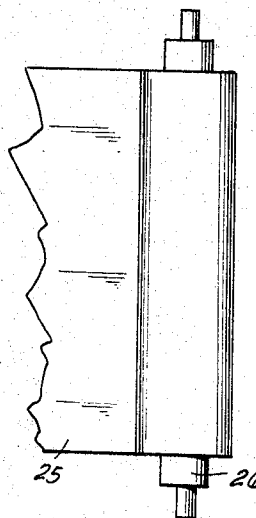


FIG. 16



FIG. 15a

INVENTOR
ERIK BROWN
BY

Pennie, Edmunds, Morton, Taylor & Adams
ATTORNEYS

Aug. 15, 1967

E. BROWN

3,335,932

CUSHION PAD FOR PACKING BREAKABLE PLATE-LIKE ARTICLES

Filed Nov. 24, 1964

4 Sheets-Sheet 4

FIG. 17

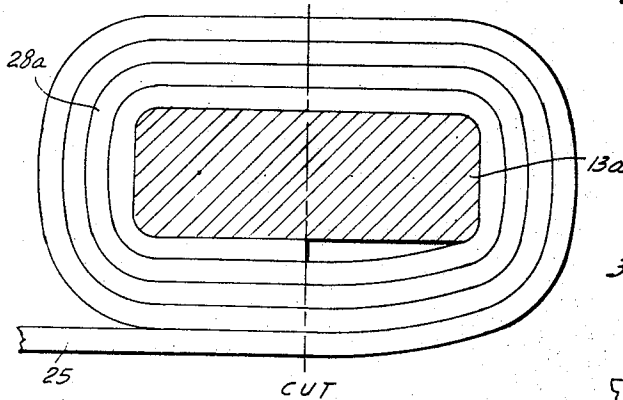


FIG. 18

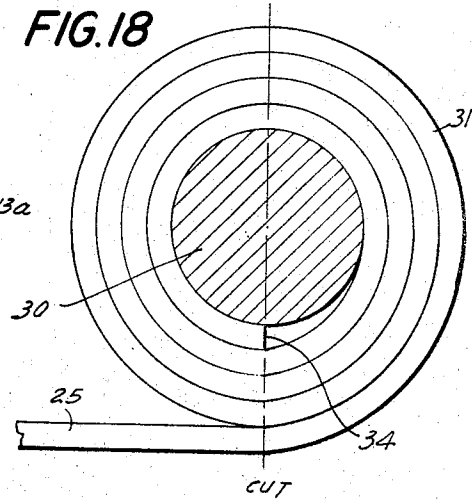


FIG. 19

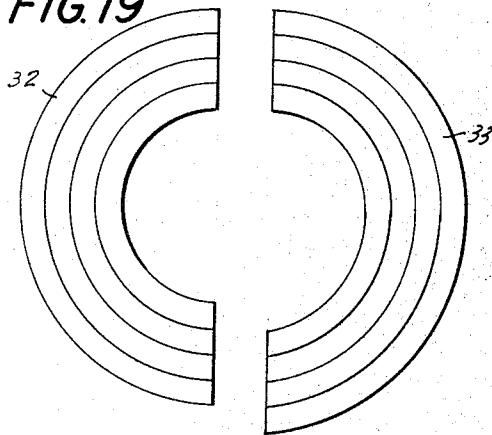


FIG. 20

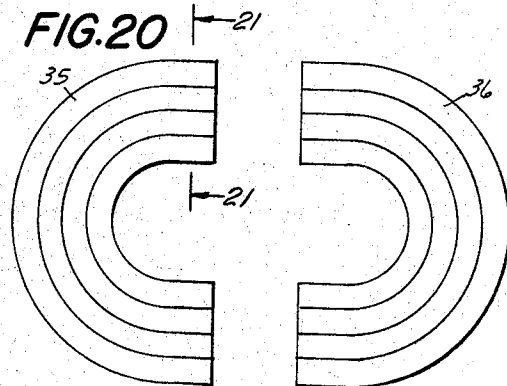


FIG. 21

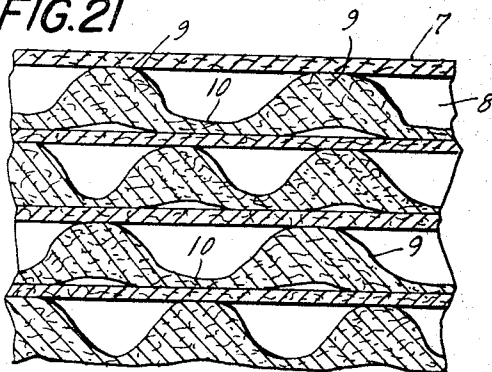
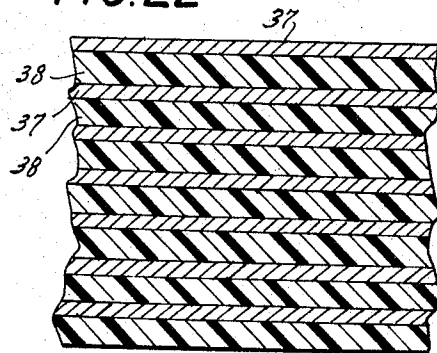


FIG. 22



INVENTOR
ERIK BROWN

BY

Pennie, Edmonds, Morton, Taylor & Adams
ATTORNEYS

1

3,335,932

CUSHION PAD FOR PACKING BREAKABLE PLATE-LIKE ARTICLES

Erik Brown, Amherst, N.H., assignor to Brown Products, Inc.

Filed Nov. 24, 1964, Ser. No. 413,484

2 Claims. (Cl. 229-14)

This invention relates to the art of packing breakable plate-like articles and more particularly to cushion pads for protecting the edges and corners of articles such as glass mirrors and the like, and plates or sheets of glass, and to the method of making these cushion pads. Such pads are used to space the plate-like article from the walls of the shipping crate or container.

The improved cushion pad for the edges of such articles is generally U-shaped in cross-section and comprises a plurality of layers of cushioning material which are bonded together by a suitable adhesive in such a manner as to form a stiff unitary structure of some considerable thickness. All parts of the U-shaped pad have approximately the same thickness, that is, both the wing portions which engage the sides of the article and the central portion connecting the wings which is adjacent the edge of the article. The cushion pad is an elongated structure and may be made in any suitable length or lengths so as to be applicable for use with fragile plate-like articles of various dimensions.

For the purpose of forming a corner cushion pad the elongated U-shaped pad is notched from the edges of the wing portions to the central connecting portion, this notch being in the form of a truncated V and permitting the end portions to be folded at right angles to one another until the opposite sides of the V notch are in contact with one another. Such notches ordinarily are placed centrally lengthwise of the pad so that the end portions extending along the corner edges of the article are of equal length, but the notch may be placed off-center so as to provide leg portions of unequal length, if desired.

The cushioning material employed in making the pad is advantageously a fluted material having spaced ribs or corrugations of molded, loosely felted used pulp, that is, pulp made from fibrous material such as ground-up paper board obtained from used containers made of conventional corrugated board. Such material is disclosed in Perry Patent 2,209,537, July 30, 1940. The intervening portions between the spaced ribs are of the same loosely felted and molded pulp material but the rib portions are substantially thicker than the intervening portions which are thus flexible and permit the material to be readily coiled, either helically or convolutely. If desired however, the cushioning material may consist of conventional corrugated board.

Also the cushioning material from which the U-shaped cushion pad is made may consist of sheets of synthetic fibrous material such for example as expanded polystyrene.

With any of the cushioning materials a backing sheet may be used to which the cushioning material such as the fluted material of molded pulp, the conventional corrugated board, or the expanded polystyrene, is secured by means of a suitable adhesive prior to being formed into the cushion pad.

In making the U-shaped cushion pad a strip or sheet of the cushioning material is formed into a tubular member having the desired number of layers of the cushioning material to provide the desired thickness of the finished article. The strip or sheet may be first coated with a suitable adhesive, such as glue or cement, or the adhesive may be introduced between the layers in any suitable way so as to cause the adjacent layers to adhere to

2

one another. The adhesive is then allowed to dry or set in order to bond the layers to one another and the tubular member cut in half lengthwise thus forming two U-shaped cushion pads.

Also, if desired, the tubular member may be cut in half lengthwise before the adhesive has set, and the wings of the thus formed U-shaped members or pads may be pressed toward one another so as to partially close the space between them. The wings are maintained in such position by any convenient means during the drying of the adhesive. In this way U-shaped cushion pads can be formed having various spacing between the wings, and if desired the wings may be placed at any suitable angle to one another, or they may be placed parallel to each other.

Advantageously the tubular member is helically wound, employing one or more strips of cushioning material of less width than the desired length of the tubular member to be formed. Alternatively, a sheet of the cushioning material having a width corresponding to the length of the tubular member to be formed can be convolutely wound.

The winding of the cushioning material may be accomplished on mandrels of various shapes, round, oval or elliptical, or rectangular with rounded corners.

The improved U-shaped cushion pad is made of layers of cushioning material which extend continuously from edge to edge of the wing portions of the pad so that the cushion protection is afforded at the sharp corners of the fragile plate to which it is applied as well as to the marginal side portions and the edges thereof.

The invention will be described more in detail in connection with the accompanying drawings, in which:

FIG. 1 is a fragmentary perspective view drawn to a small scale and showing a U-shaped cushion pad applied to one edge of a breakable plate which may for example be a glass mirror;

FIG. 2 is a longitudinal section taken on line 2-2 of FIG. 1 drawn to a larger scale;

FIG. 3 is a view in side elevation showing the U-shaped pad of FIGS. 1 and 2 in inverted position and drawn to a still larger scale;

FIG. 4 shows the pad of FIG. 3 as viewed from the top; FIG. 5 is an end view looking from the right of FIG. 1; FIG. 6 is a view similar to FIG. 5 showing a modified form of pad;

FIG. 7 is a perspective view similar to FIG. 1 showing a corner pad in position on the glass mirror;

FIG. 8 is a central vertical section taken on line 8-8 of FIG. 7;

FIG. 9 is a vertical section taken on line 9-9 of FIG. 8;

FIG. 10 is a view in side elevation similar to FIG. 3 showing a notched U-shaped pad from which to form the corner pad of FIGS. 7 and 8;

FIG. 11 shows the pad of FIG. 10 as viewed from above;

FIG. 12 is an end view of the pad of FIGS. 10 and 11 and also of FIGS. 3 and 4;

FIG. 13 is a view showing the formation of a helically wound tubular member for making the U-shaped pads of FIGS. 1-6;

FIG. 14 shows a partially completed helically wound tubular member and is a top plan view of FIG. 13;

FIG. 15 shows the convolute winding of a sheet of cushioning material on an elliptical mandrel;

FIG. 15a shows the formation of two U-shaped cushion pads from the tubular member formed on the mandrel of FIG. 15;

FIG. 16 shows a portion of FIG. 15 in plan view;

FIGS. 17-22, drawn to an enlarged scale, show details of the winding and formation of the U-shaped pads;

FIG. 17 is intended to show in transverse section the convolute winding of a sheet on a rectangular mandrel with rounded corners;

FIG. 18 shows in transverse section the convolute winding of a sheet on a cylindrical mandrel;

FIG. 19 shows the two halves of the tubular member of FIG. 18 after central lengthwise cutting;

FIG. 20 shows the two halves of FIG. 19 after lateral pressing to form two U-shaped pads the wings of which are parallel;

FIG. 21 shows in fragmentary section a detail of the fluted cushioning material of loosely felted pulp; and

FIG. 22 is a similar view showing cushioning material of expanded polystyrene.

Referring now to these drawings, in FIGS. 1-6 inclusive there is shown a U-shaped cushioning pad 1 adapted to be used on the edge of a fragile article such as a glass mirror 2 shown in fragmentary view in FIG. 1. The pad 1 has wing portions 3 and 4 which are joined together by a central or connecting portion 5. Between wing portions 3 and 4 a channel is formed to receive the marginal edge of the member 2.

The U-shaped cushion pad 1 is made up of a plurality of layers 6, shown as four in number, of fluted cushioning material of molded loosely felted pulp as illustrated in detail in FIG. 21. Each of the layers 6 consists of a backing sheet 7 to which the fluted or corrugated sheet 8 is adhesively secured. As shown in FIG. 21 the molded sheet 8 comprises spaced ribs or corrugations 9 of solid but loosely felted used pulp interconnected with one another by intervening portions 10 of the same but much thinner material. The backing sheet 7 is of flexible paper, advantageously kraft paper. An outer layer 11 (FIGS. 5 and 6) of heavier kraft paper is advantageously applied.

As shown in FIGS. 1-6 the U-shaped cushion pad 1 is made up of a plurality of relatively narrow strips 12 of the fluted felted pulp material having the ribs 9, intervening portions 10 and backing sheet 7, such strips 12 being helically wound after the manner shown in FIGS. 13 and 14 to form the tubular member from which the U-shaped pad of FIGS. 3 and 4 is cut. FIGS. 13 and 14 show a rectangular mandrel having rounded corners rotating in the counterclockwise direction and drawing a plurality of strips 12 (5 being shown) from a series of supply rolls 14 and over guide rolls 15, the strips being wound on to the mandrel to form a tubular member 16. Guide rolls 15 direct the strips 12 in an angular direction (FIG. 13) on to the mandrel 13 so as to cause the strips to overlap one another and form a helically wound tubular member as indicated in FIG. 14.

If desired, guide rolls 15 may be used to apply adhesive to the underside of the several strips 12, these rolls being arranged to receive adhesive from suitable containers (not shown). Also, if desired, special separate adhesive-applying rolls may be employed.

After the tubular member 16 has been wound and either before or after the adhesive has dried or set the member is severed lengthwise to form two U-shaped cushion pads such as the pad 1 shown in FIGS. 1-5. If the severing operation is performed before the adhesive has set the wings 3 and 4 may be spread apart somewhat as shown in FIG. 6 to place them at any desired angle to one another instead of leaving the wings parallel to each other. Such angular arrangements are desirable for packing certain articles, such for example as a glass mirror which has been framed. Even when the wings are placed for parallel arrangement when the pad is in position on the article, the natural position of the wings is as shown in FIG. 12, that is, slightly closer together at their edges.

Referring now to FIGS. 7-12, and particularly to FIGS. 10 and 11, the wings of the U-shaped pad 1 are here shown as having been notched for the purpose of forming the corner pad 17 of FIGS. 7 and 8. In this operation a suitable tool cuts a wide notch in each of wings 3 and 4, indicated by numeral 18. The notches in

the two wings are in alignment and have side portions 19 and 20 at right angles to one another. These notches are truncated by a short flat bottom section 21 which is disposed slightly below the upper surface of central portion 5.

When the two end portions of the pad on the opposite sides of the notches 18 are swung or bent upwardly with respect to one another (referring to FIG. 10), until the surfaces 19 and 20 of the notches contact one another, as shown in FIG. 7, the two end portions or legs 23 and 24 will be at right angles to one another and form the corner pad 17. In so doing the layers of material between the bottom surface 21 of the notch and the outer surface of central portion 10 will bend or fold and its outer end portions will be squeezed outwardly to form a prominence on each side, one of which is shown at 22 in FIG. 7.

The resilience of the material at this part of the U-shaped pad will tend to cause the two leg portions 23 and 24 of the corner pad 17 to spring away from the edges of plate member 2, and in order to maintain the corner pad in position the wings 3 and 4, in their normal or natural positions tend to approach one another as shown in FIG. 12 and as previously mentioned. The resiliency of the several thicknesses of the cushioning material in these wing portions exerts a squeezing pressure against the side margins of member 2. In applying the pad to the corner of member 2 the wing portions are spread apart and their resilience clamps the legs 23 and 24 to the surface of the plate and frictionally holds the legs in the desired position.

Instead of making the U-shaped cushion pad 1 and the corner cushion pad 17 of helically wound material, as described, they may both be made by the convolute winding of a sheet of material having the same width as the length of the pad, or a sheet of material wider than the length of the pads may be first wound to form a long tubular member which may then be cut crosswise to form units of the desired length. Thus as shown in FIG. 15 a sheet 25 may be wound on to a mandrel 26 which may be elliptical in cross-section and FIG. 17 shows the sheet being wound on a rounded rectangular mandrel 13a. As described in connection with FIG. 13 mandrels 26 and 13a are rotated and each draws sheet 25 over a guide roll 26 (which may also apply adhesive), from a supply roll 27. After the elliptical tubular member 28 or 28a reaches the desired thickness it is removed from the mandrel and severed to form two similar U-shaped pads. FIG. 15a shows two similar pads 29 formed from tubular member 28.

The shape of mandrel 26 may impart directly to the tubular member 28 the desired formation for the U-shaped pads 29. In that case the adhesive is allowed to set before the severing operation. If however it is desired to change the shape of the pads 29 the severing may be done before the adhesive has set and the shape of the pads modified by compression or otherwise.

Referring now to FIGS. 18-20 there is here shown in somewhat magnified detail the convolute winding of sheet 25 on a circular mandrel 30, to form a tubular member 31 after four layers have been laid. In severing this tubular member into two halves 32 and 33 as shown in FIG. 19, the cut is made at the inner end 34 of sheet 25. Because of the thickness of the layers the lower part of half portion 33 will be displaced slightly as shown in FIG. 19. This is corrected when the two half portions 32 and 33 are pressed between plungers (not shown) prior to the setting of the adhesive. Such pressing operation forms two identical U-shaped pads 35 and 36 as shown in FIG. 20.

The U-shaped cushion pad of the invention has been described as being made of the molded, fluted, felted used pulp material shown and described in connection with FIG. 21. It will be understood however that the material shown in FIG. 22 may be used if desired. In this material each layer is made up of a backing sheet 37 of suitable

5

paper such as kraft paper to which a sheet 38 of expanded polystyrene has been secured by adhesive. The U-shaped cushion pad 1 of FIGS. 1-6 may be made of this material by helical winding as previously described in connection with FIGS. 13 and 14, or by convolute winding as described in connection with FIGS. 15, 16 and 17. It may also be formed directly on the desired mandrel to the particular cross-sectional shape desired, or the tubular member of such material may be removed from the mandrel prior to the setting of the adhesive and then re-shaped either to narrow or to widen the spacing between the edges of the wings of the cushion pad member.

It will be understood that the U-shaped pads made by either helical or convolute winding of any of the cushioning materials, such as the molded felted pulp, expanded polystyrene, or of conventional corrugated board, may be notched and formed into corner cushion pads, as described.

I claim:

1. An elongated cushion pad for application to the edges of a fragile plate-like article, the pad being generally U-shaped in cross section from end to end and comprising a plurality of layers of cushioning material bonded to one another and forming a unitary structure the pad having wing portions to engage the opposite sides of the article and a central portion connecting the wings for engaging the edge of the article, the central portion having the same thickness as the two wing portions and being of continuously uniform thickness from wing to wing, the two wing portions having V-shaped notches in crosswise alignment with one another, said notches having their tips cut off by a plane disposed somewhat below

6

the inner surface of the continuous central portion, the end portions of the pad on the opposite sides of said notches being foldable in a curve around the corner of the article at right angles to one another to form a corner cushion pad.

2. A cushion pad as set forth in claim 1 in which in their normal positions the outer portions of the opposing surfaces of the wing portions are disposed closer to one another than the inner portions thereof so that when applied to a plate-like article to be protected the wing portions by their resiliency frictionally engage the surfaces of the article so as to hold the end portions of the corner pad at right angles to each other.

References Cited

UNITED STATES PATENTS

1,619,011	3/1927	Agar	206-62
2,209,537	7/1940	Perry	161-123
2,324,031	7/1943	Schiffenhaus	206-46
2,714,570	8/1955	Brown	161-123
2,791,369	5/1957	Paige	229-14
2,896,833	7/1959	Markham	206-62
3,063,885	11/1962	Kieffer	161-107
3,129,868	4/1964	Jenk	229-14
3,255,876	6/1966	Wolf	206-62

FOREIGN PATENTS

46,938	10/1939	Netherlands.
305,591	5/1955	Switzerland.

JOSEPH R. LECLAIR, *Primary Examiner.*

R. PESHOCK, *Assistant Examiner.*