A cushion made of resilient polymer is a push fit onto the edge or corner of a sheet of glass or other sheet material susceptible to chipping. The cushion is of modified U-section having a shock absorbing bed and upstanding legs which define a sheet receiving slot. The legs diverge when the sheet is inserted and exert a gripping force sufficient to retain the cushion when the sheet is carried.
CUSHION FOR Carrigation OF SHEET MATERIALS

FIELD OF THE INVENTION

[0001] This invention concerns a cushion for protecting sheets or slabs from damage to their edges. Glass, both broken and unbroken, stone, CORIAN® synthetic stone, laminated benchtops and pasteboard all present a problem to a carrier.

BACKGROUND OF THE INVENTION

[0002] The transport of glass to the glazing site is risky in that the glass only has to touch a hard surface for it to chip or fracture, sometimes explosively, due to forces generated during tempering, lamination or heat soaking. Stairwells, lifts, low beams in mines and other obstacles all increase the possibility of unintentional impacts. If a suction cup loses grip and the sheet drops just 10 mm, the sheet may be damaged such that it cannot be used. Many pieces are tailor made and cannot be replaced from stock and replacement may add another week to the job. A new high rise building may require several million dollars worth of glass.

[0003] Similar risks occur in the delivery of cabinet work such as tables tops, bench tops, wardrobe panels and the like which must be carried up stairs in a building. These are sometimes paper wrapped because it is the only way that polystyrene pads can be held in place.

PRIOR ART

[0004] Cushions to assist temporarily in the manual carriage of sheet glass are not available to glass supply companies as a piece of standard equipment. Glass handlers improvise by taping cardboard packers to the edge of the glass. Blocks of expanded polystyrene may likewise be taped to the glass edge or kept in place by wrapping paper.

[0005] If a large sheet is wheeled on a trolley the trolley may have a wooden 3x2 timber batten covered on the support frame with a carpet strip.

[0006] When a manufacturer, mass produced article such as a framed mirror is made, the moulded frame has a groove for a pvc sealing gasket U.S. Pat. No. 3,293,738 shows such a mirror gasket but these function to accommodate size variations in the glass and the gaskets are permanent.

SUMMARY OF THE INVENTION

[0007] An apparatus aspect of the invention provides a cushion for the edge of a sheet of glass comprising a body of resilient polymeric material of modified U-section having a shock absorbing bed and upstanding legs projecting up from the bed, the upstanding legs defining a sheet receiving slot, the leg divergence caused by sheet insertion creating a gripping force sufficient to support the weight of the sheet.

[0008] The body may be a strip for use on a straight edge of the sheet, or a corner shaped member for use on a corner of the sheet.

[0009] Another apparatus aspect of the invention provides a cushion for the edge of a sheet of glass comprising a strip of resilient polymeric material of modified U-section having a shock absorbing bed and upstanding legs defining a sheet receiving slot, the leg divergence caused by sheet insertion creating a gripping force sufficient to support the weight of the sheet.

[0010] Yet another apparatus aspect of the invention provides a cushion for the corner of a sheet of glass comprising a corner-shaped member made of resilient polymeric material having a modified U-section with upstanding legs defining a sheet receiving slot, the leg divergence caused by sheet insertion creating a gripping force sufficient to support the weight of the cushion.

[0011] The cushion may be L-shaped. Alternatively the cushion may be of triangular or quadrant shape. The slot width may be 5-35 mm.

[0012] The bed may be of enlarged width in relation to the width of the legs in order to increase the cushioning effect.

[0013] The legs may mutually diverge towards the base. The divergence may produce a gap on each side of the sheet when the cushion is mounted thereon. The gap may improve shock absorbing capability of the cushion. Instead of, or as well as, the improved shock absorption, the divergence of the legs towards the base and the resultant width of the base may improve stability of the cushion when the base is rested on a flat surface.

[0014] The legs may be biased to close near the entrance of the slot. This may be facilitated by the leg divergence towards the base. Thus the upper part of the slot may be narrow and the legs may close together. The lower part of the slot may diverge so that part of the slot is of triangular section.

[0015] The legs may be resilient so as to close on the glass once inserted into the cushion, thereby enabling the cushion to remain in position when the glass is lifted.

[0016] The base may have a ridge projecting from the base into the slot so that the edge of the glass sheet contacts the ridge first when the cushion is applied. The ridge may be substituted by a row of integral studs. The integral studs may be substantially quadrangular shaped plates. Alternatively the integral studs may be substantially semi spherical in shape.

[0017] The entrance to the slot may be tapered in order to facilitate the admission of the leading edge of the sheet. The cushion is suitable for glass sheets from 10 mm thickness.

[0018] The cushion may be made of natural or synthetic rubber, polyurethane or commercial equivalents.

[0019] The product may be extruded in strip form and cast in all other forms. In a variant method, the product is generated as a closed cell foam article. In a further variant, the extrusions are cut at 45° and stuck together using adhesive.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] One embodiment of the invention is now described with reference to the accompanying drawings, in which:

[0021] FIG. 1 is a side view of an L-shaped form of the cushion.

[0022] FIG. 2 is a front view of the cushion of FIG. 1.

[0023] FIG. 3 is a perspective view of a strip cushion.

[0024] FIG. 4 is a front sectional view of a strip cushion in position on a sheet of glass.

[0025] FIG. 5 is a diagram of the cushion in position on a sheet of glass being carried up steps.

[0026] FIG. 6 is a front view of a strip cushion with quadrilateral studs.

[0027] FIG. 7 is an exploded perspective view of a mould used to make L-shaped cushions.

DETAILED DESCRIPTION WITH RESPECT TO THE DRAWINGS

[0028] Referring now to the drawings, the cushion is L-shaped 1, being about 150 mm in height and 150 mm in length in order to clasp the corner of the sheet of glass. The cushion is cast in one piece from a two part polyurethane. The base 2 is about 15 mm thick and 40 mm wide. The legs 4 define a prismatic space 6 and close together above the space, the edges of the legs each have a bevel 8 to ease the entry of the leading edge of a sheet of glass 10 as shown in FIG. 4.
The legs taper in thickness being widest at 12 where they join the base. The resilience of the section makes the legs self-closing so that once the glass is inserted into the cushion, it remains in position when the glass is lifted. The cushion’s coefficient of friction is large enough to sustain with the mass of the cushion which is about 450 grams for corner sections 1 and about 650 grams for straight sections 16.

Extra shock resistance is afforded by semi-spherical integral studs 14, 5 mm high which occur at 30 mm intervals and protrude into the prismatic space. These are squashed when glass rests on the cushion on the ground.

While the corners of a glass sheet are protected by the L-shaped cushion, the ground facing edge of the sheet is protected by the straight strip 16 shown in FIG. 3. In this variant, the studs are replaced by a ridge 18.

Referring to FIG. 6 there is shown a straight strip 16 having a series of spaced quadrangular shaped integral studs 20.

FIG. 7 shows a mould, generally designated 22, used to make L-shaped cushions 1. It is envisaged that strip cushions may be cast from an alternative mould or otherwise extruded. The mould 22 comprises a central portion 24 and two side portions 26, 28. The mould portions 24, 26, 28 are bound together by five screws 30 which pass therethrough and are held in position by butterfly nuts 32. End cap 36 is attached to the ends of the side portions 26, 28 by screw heads 38 and butterfly nuts 40. Each side portion 26 and 28 defines an L-shaped groove 42 and the central portion 24 has a longitudinal bulb 43.

When the mould 22 is assembled, the surfaces of the grooves 42 and the bulb 43 form a continuous boundary for a recess 44 which outlines the shape of an L-cushion 1.

A cushion may be prepared by hand or by a mechanical measure/mix/inject system (which limits material wastage) in the following stages:

1. Prepare a two part polyurethane mix of Poly Base (part A) and diphenylmethane-4,4’-disiloxanate (part B); These materials may be produced by and obtained from Australian company RLA Polymers Pty Ltd; The materials are pre measured by weight in which part A is 100 and part B is 28. Temperature of the components affects performance of the materials. Part A performs optimally in a range from 8 to 30 degrees celsius and part B performs optimally in a range from 25 to 30 degrees celsius; The mixture should be stirred for between 65 and 75 seconds;

2. Pour the mix into the recess 44 of the mould 22; At around 180 seconds the mix becomes unpourable, so the mix should be poured within about 170 seconds before it begins to jell;

3. Allow the mix to cure; Cure time with preheated mould casings runs from about 40 to 60 minutes depending on ambient temperature; The warmer the environment the shorter the cure time; If the ambient temperature is too low the mix may refuse to cure;

4. Open the mould by unscrewing butterfly nuts 32, 40 and removing screws 30, and 38;

5. Remove the cushion 1 from the mould; Demoulding can take place once the surface of the material left exposed is no longer sticky to touch.

I have found the advantages of the above embodiment to be:

1. Breakage rate is reduced.

2. Jobs proceed quicker because the extreme care required for handling glass is minimised.

3. Laminated kitchen tops and slabs made for CORIANTM or polished granite can be similarly protected.

4. The cushion is reusable.

5. It is to be understood that the word “comprising” as used throughout the specification is to be interpreted in its inclusive form, i.e. use of the word “comprising” does not exclude the addition of other elements.

6. It is to be understood that various modifications of and/or additions to the invention can be made without departing from the basic nature of the invention. These modifications and/or additions are therefore considered to fall within the scope of the invention.

A reusable cushion for the edge of a sheet of glass comprising a body of resilient polymeric material of modified U-section having a shock absorbing bed and upstanding legs projecting up from the bed, the upstanding legs defining a sheet receiving slot, the leg divergence caused by sheet insertion creating a gripping force sufficient to support the weight of the cushion.

2. The reusable cushion according to claim 1 wherein the legs converge as they project up from the bed before diverging towards the entrance of the slot.

3. The reusable cushion according to claim 2 wherein the legs are formed with a modified S-curve and reverse modified S-curve respectively, the bases of which are joined to form the shock absorbing bed.

4. The reusable cushion according to claim 3 wherein the body is a strip.

5. The reusable cushion according to claim 3 wherein the body is L-shaped.

6. The reusable cushion according to claim 3 wherein the slot width is 5-35 mm.

7. The reusable cushion according to preceding claim 4 wherein the bed is of enlarged width in relation to the width of the legs in order to increase the cushioning effect.

8. The reusable cushion according to claim 1 wherein the cushion’s coefficient of friction is large enough to sustain the mass of the cushion.

9. The reusable cushion according to claim 1 wherein the base has a row of integral studs projecting from the base into the slot.

10. The reusable cushion according to claim 9 wherein the integral studs are substantially quadrangular shaped bulges.

11. The reusable cushion according to claim 9 wherein the integral studs are substantially semispherical in shape.

12. The reusable cushion according to claim 3 wherein the base has a ridge projecting from the base into the slot.

13. The reusable cushion according to claim 1 wherein the legs are resilient so as to close on the glass once inserted into the cushion.

14. The reusable cushion according to claim 1 wherein the entrance to the slot is tapered in order to facilitate admission of the leading edge of the sheet.

15. The reusable cushion according to claim 13 wherein the cushion is suitable for mounting on glass sheets of 10 to 20 mm thickness.

16. The reusable cushion according to claim 1 wherein the cushion is made of natural or synthetic rubber or polyurethane.

17. A mould for casting a reusable cushion in accordance with claim 1.

(canceled)