

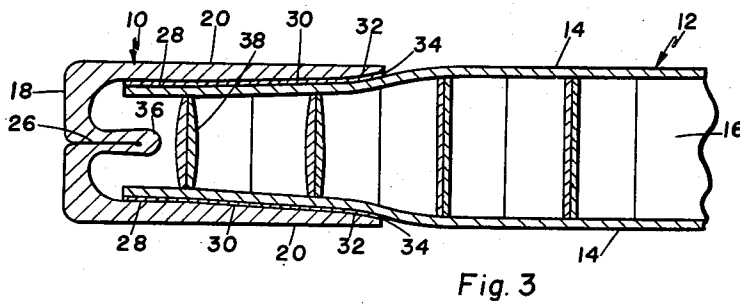
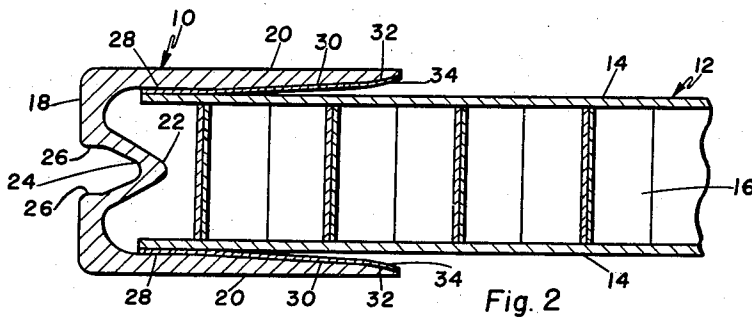
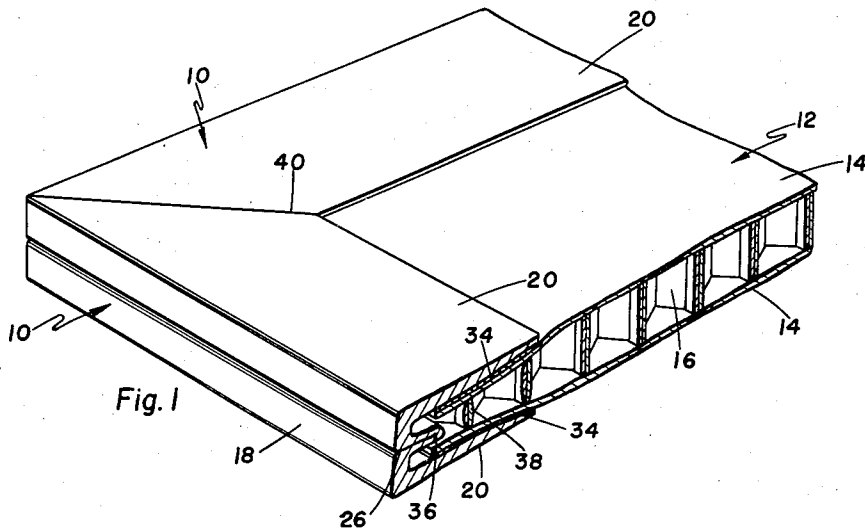
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STRUCTURAL PANEL

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1

2

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STRUCTURAL PANEL

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The present invention relates generally to structural panels and more particularly to a structural panel having bound edges and method for making the same.

The primary object of this invention is to provide a structural panel in which a shaped channel is placed over the edge of the panel and pressed into place, the channel being designed to collapse in such a manner as to be firmly secured to the panel.

Another object of this invention is to provide an edge binding which greatly reinforces the panel when applied.

A further object of this invention is to provide an edge binding which, when collapsed, has an internal rib to which various fixtures can be screwed or otherwise secured.

Yet another object of this invention is to provide an edge binding which is finished flush with the normal surface of the panel.

Another object of this invention is to provide a structural panel which is adapted for fabrication from many different materials, so that the choice of material can be according to the dictates of availability and price considerations, the exact sizes and proportions being matters easily determined to suit particular conditions and needs.

Finally, it is an object to provide structural panel of the aforementioned character which is simple, and convenient to use and which will give generally efficient and durable service.

With these and other objects definitely in view, this invention consists in the novel construction, combination and arrangement of elements and portions, as will be hereinafter fully described in the specification, particularly pointed out in the claims, and illustrated in the drawing which form a material part of this disclosure and wherein similar characters of reference indicate similar or identical elements and portions throughout the specification and throughout the views of the drawing, and in which:

Fig. 1 is a cutaway perspective view of a corner of a panel with the edge binding secured in place.

Fig. 2 is a transverse sectional view of the edge of a panel with the edge binding in place before pressing.

Fig. 3 is a sectional view similar to Fig. 2 but showing the edge binding collapsed and secured.

Referring now to the drawing in detail, the edge binding comprises a channel 10, the cross sectional shape of which is roughly similar to a wide E with the center bar divided after the manner of the Greek letter sigma. The channel 10 is shown in the drawing, by way of illustration, as applied to a piece of constructional panel known as a honeycomb slab 12, which consists of a pair of surface skins 14 separated by a honeycomb structure 16 of reinforced paper, plastic, metal, or the like, various forms of this type of panel being presently available. It should be understood, however, that the use of the channel is not limited to such a structural panel, but can be applied to plywood, insulation material, or

compressed fibrous material such as that sold under the trade name of "Presdwood."

The channel 10 comprises a bight portion or wall 18 having a wide flange 20 extending generally at right angles from each longitudinal edge. The wall 18 is centrally divided by a V-shaped longitudinal rib 22 extending inwardly between the flanges 20, and defining a tapered groove 24 in said wall. The edges of the groove 24 at their junction with the wall 18 are flat and substantially parallel and constitute opposed stop faces 26. The inner surface of each flange 20 has a flat portion 28 of substantially constant thickness extending directly from the wall 18, and an outwardly tapering portion 30 unitary therewith, while the edge portions of the flanges have outwardly curving inner face portions 32. The outer surfaces of the flanges 20 are flat and generally parallel.

To bind the edge of a panel, a length of the channel 10 is slipped onto the panel 12 as in Fig. 2, the inner surfaces of the flanges 20 being coated with a suitable adhesive 34 if necessary. The edge of panel 12 with the channel 10 in place is then placed in a suitable press and pressure is applied to the channel.

Under sufficient pressure, the V-shaped rib 22 collapses until the stop faces 26 come together, as in Fig. 3, to form a substantially solid or closed folded rib 36. The flanges 20 are pressed into firm adhesive contact with the skins 14 and collapse the edge portion of the panel 12 so that the internal structure is buckled, as indicated at 38. This compression of the panel 12 itself has been found to have no adverse effect on the structural strength of the finished panel and, in fact, in the case of the honeycomb type panel, the effective sealing of the edges by the firmly compressed channel is advantageous. The tapering and curved edge portion of the flanges 20 allow the panel 12 to be compressed gradually so that the skins 14 are curved smoothly adjacent said flanges rather than abruptly joggled.

It should be noted that the collapsed channel 10 is equal in thickness to the thickness of the panel 12, the outer surfaces of the flanges 20 and the skins 14 being planar. This facilitates the construction of flush panels for sliding doors, flooring, walls and other purposes. The channel 10 is manufactured in standard sizes to fit standard structural panels, the normal width of the channel and the spacing of the stop faces 26 being designed so that the collapsed channel is flush with the panel surface. The stop faces 26 thus limit the compression of the channel 10 to the correct dimensions.

As shown in Fig. 1, corners are finished by a simple miter joint indicated at 40 to provide a neat appearance and to eliminate the need for additional parts or special treatment of the corners.

The folded ribs 36 provide ample material for the insertion of screws to attached fixtures to the panel, the screws being threaded directly into said ribs. The flanges 20 also reinforce the edges of the panel for attachment of fixtures such as hinges, brackets, or the like. Due to the light weight, high strength and simplicity of the structure, the bound panels are particularly suitable for use in aircraft, although many other uses will be readily apparent.

The operation of this invention will be clearly comprehended from a consideration of the foregoing description of the mechanical details thereof, taken in connection with the drawing and the above recited objects. It will be obvious that all said objects are amply achieved by this invention.

Further description would appear to be unnecessary. It is understood that minor variation from the forms of the invention disclosed herein may be made without departure from the spirit and scope of the invention, and

3

that the specification and drawing are to be considered as merely illustrative rather than limiting.

We claim:

1. A structural element comprising: a panel; a channel secured to edge portions of said panel; said channel having a bight and extended flanges overlapping the surfaces of said portions; said channel having a rib integral with said bight and extending inwardly between said flanges, said rib being substantially coextensive in length with said bight said channel being bonded to the edge of said panel with the portion of the panel between said flanges compressed thereby.

2. A structural element comprising: a panel; a channel secured to edge portions of said panel; said channel having a bight and extended flanges overlapping the surfaces of said portions; said channel having a rib integral with said bight and extending inwardly between said flanges, said rib being substantially coextensive in length with said bight said channel being bonded to the edge of said panel with the portion of the panel between said flanges compressed thereby; said flanges being tapered so that the compression of said portions is progressively increased toward said rib.

3. A structural element comprising: a panel; a channel secured to edge portions of said panel; said channel having a bight and extended flanges overlapping the surfaces of said portions; said channel having a rib integral with said bight and extending inwardly between said flanges, said rib being substantially coextensive in length with said bight said channel being bonded to the edge of said panel with the portion of the panel between said flanges compressed thereby; said flanges being tapered so that the compression of said portions is progressively increased toward said rib; the outer surfaces of said channel and said panel being substantially planar.

4. An edge binding for a structural panel element comprising: a channel having a wall portion; substantially flat, parallel flanges extending from the longitudinal edges of said wall; said wall including an intermediate longitudinal rib deformable by compression and projecting inwardly between said flanges; and flat opposed stop faces on said intermediate portion for limiting the compression of the channel.

4

5. An edge binding for a structural panel element comprising: a channel having a wall and substantially flat, parallel flanges extending from the longitudinal edges of said wall; said wall including an intermediate longitudinal rib deformable by compression and projecting inwardly between said flanges; and flat opposed stop faces on said intermediate portion for limiting the compression of the channel; said rib being substantially V-shape in cross-section before compression and having confronting angulated surfaces; and said stop faces being on said surfaces.

6. The method of binding the edge of a structural panel comprising; forming a channel with a V-shaped rib in the bight thereof; applying adhesive to the inner surfaces of the flanges of the channel; placing the channel over the edge of a panel with the adhesive coated flanges overlapping the edge of the panel; and collapsing the channel under pressure so that the V-shaped rib is collapsed and the edge of the panel is compressed between the flanges.

7. The method of binding the edge of a structural panel comprising; forming a channel with a V-shaped rib in the bight thereof; applying adhesive to the inner surfaces of the flanges of the channel; placing the channel over the edge of a flat panel with the adhesive coated flanges overlapping the edge of the panel; collapsing the channel under pressure so that the edge of the panel is compressed between the flanges; and continuing to apply the pressure until the V-shaped rib is collapsed and the outer surfaces of the channel are substantially planar with those of the panel.

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