

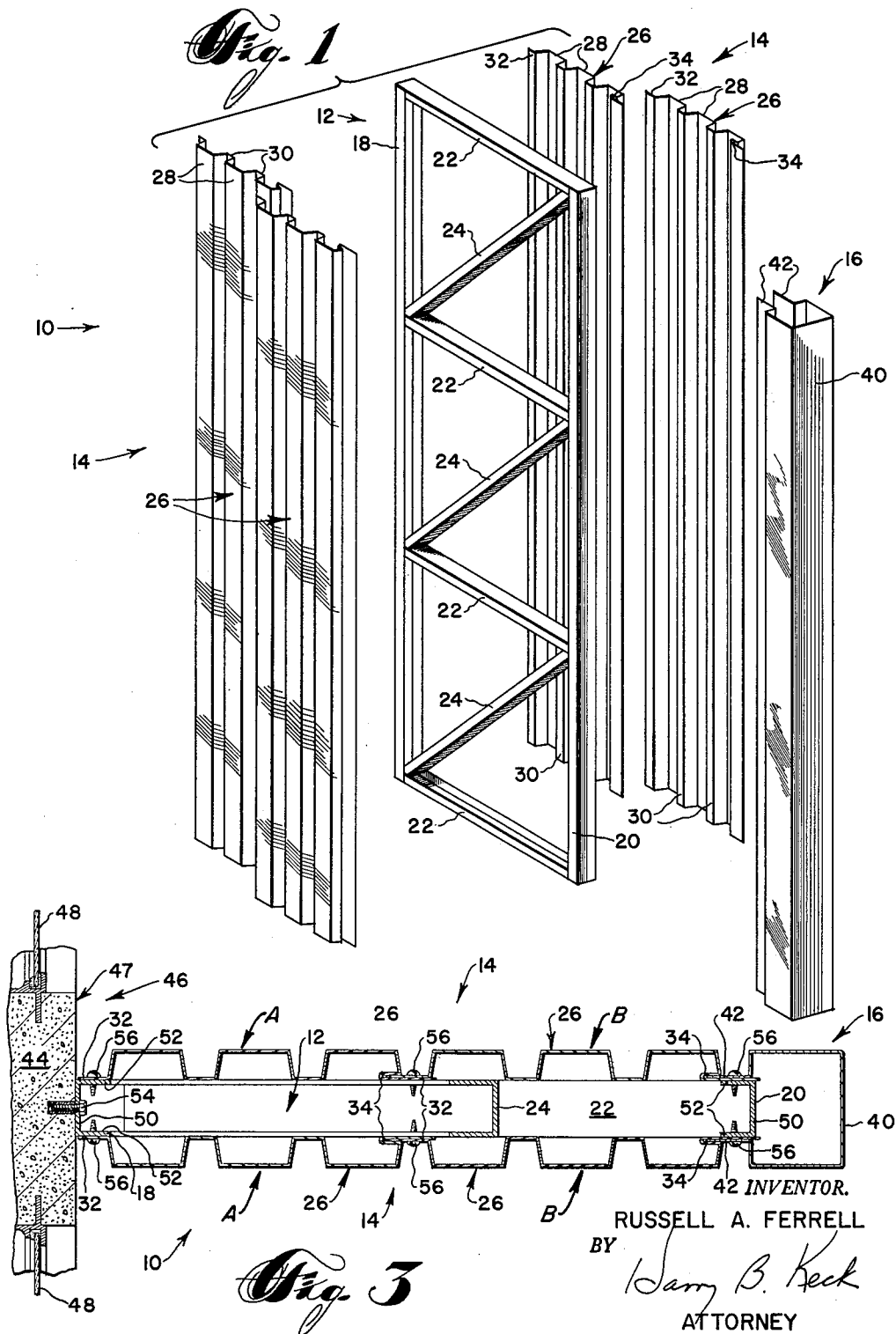
April 21, 1964

R. A. FERRELL
SUNSHADE PANEL UNIT

3,129,793

Filed Dec. 15, 1960

2 Sheets-Sheet 1



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R. A. FERRELL
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2 Sheets-Sheet 2

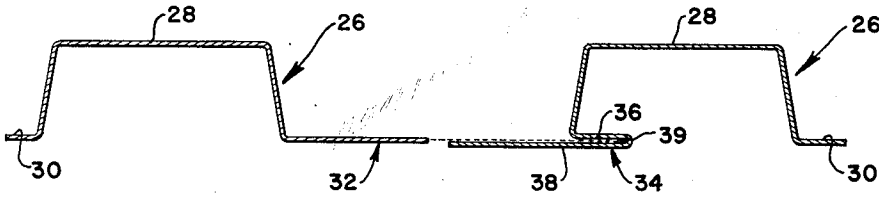


Fig. 2

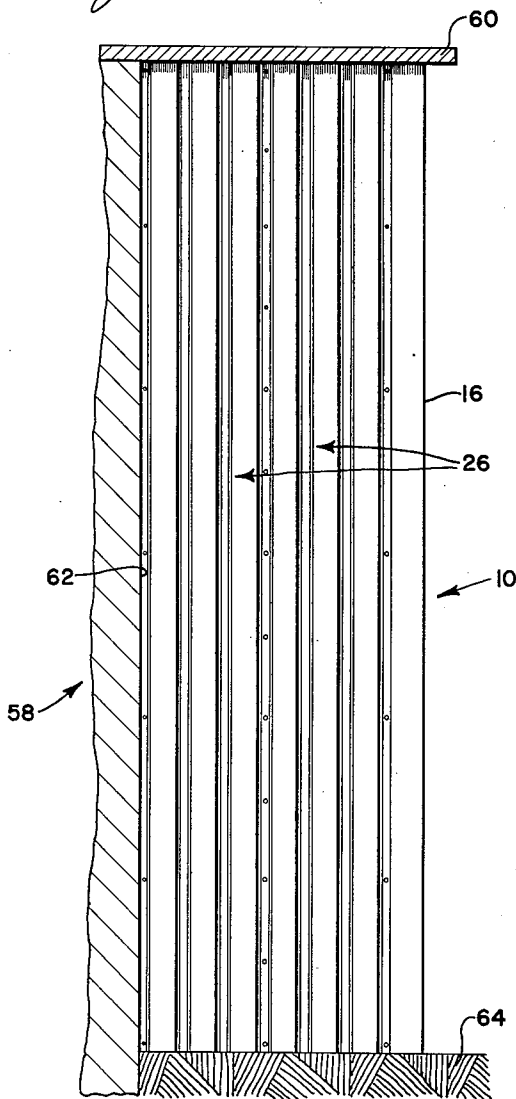


Fig. 4

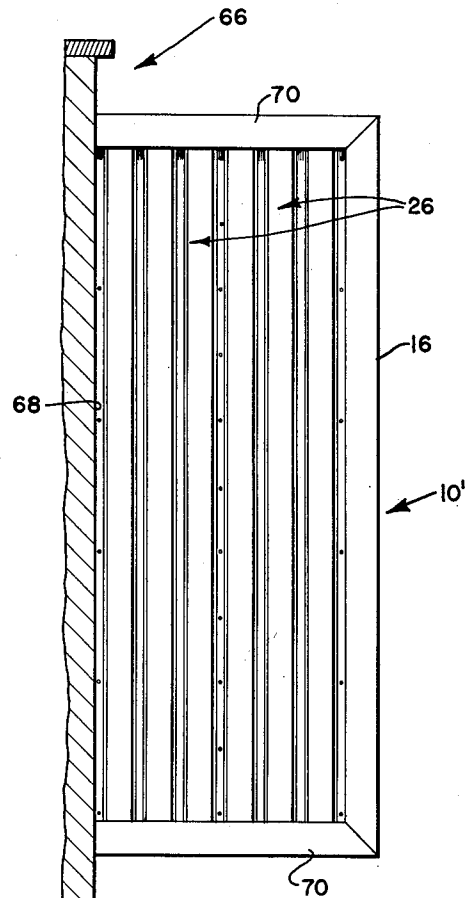


Fig. 5

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3,129,793

SUNSHADE PANEL UNIT

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8 Claims. (Cl. 189-34)

This invention relates to a panel unit. More particularly this invention relates to a panel unit adapted for use as a sunshade in building construction.

The primary object of this invention is to provide a sunshade panel unit adapted to be secured to an exterior face of a building in shading relation with windows disposed therein.

Another object of this invention is to provide a sunshade panel unit comprising a minimum number of lightweight components whereby the panel unit is readily assembled and installed.

Still another object of this invention is to provide a panel unit having an aesthetic appearance which adds to the architectural prominence of a building.

These and other objects and advantages of the present invention will become apparent from the following detailed description by reference to the accompanying drawings in which:

FIGURE 1 is an exploded isometric view of the present sunshade panel;

FIGURE 2 is a fragmentary exploded cross-sectional view illustrating the side construction of facing sheets of the present panel;

FIGURE 3 is a cross-sectional assembly view of the present panel adapted to an exterior wall of a building;

FIGURE 4 is a cross-sectional side elevation view of a building provided with the present panel in one embodiment; and

FIGURE 5 is a cross-sectional side elevation view of a building provided with the present panel in an alternative embodiment.

In FIGURE 1 a panel, generally designated by the numeral 10, is illustrated in an exploded isometric view.

In general, the panel 10 comprises an internal grid structure 12; two facing sheets 14; and a cap member 16.

Internal Grid Structure

The internal grid structure 12 includes a first vertical frame element 18, a second vertical frame element 20, a number of horizontal brace elements 22, and a number of diagonal brace elements 24. The horizontal brace elements 22 and the diagonal brace elements 24 maintain the first and second frame elements 18, 20 in a fixed spaced parallel relationship. The brace elements 22, 24 are secured to the first and second frame elements 18, 20 by any suitable means such as welding.

Preferably the elements 18, 20, 22, 24 of the internal grid structure 12 are lightweight channel shaped members which may comprise extruded aluminum or lightweight structural steel.

Facing Sheets

The two facing sheets 14 each comprise a plurality of corrugated interlocking elements 26 having crests 28 and valleys 30. The corrugated elements 26 also include a tongue like male lip 32 and U-shaped female lip 34 on the two side edges thereof. Referring to FIGURE 2, wherein the male lip 32 and the female lip 34 are more fully illustrated, the male lip 32 is substantially coplanar with the valleys 30. The U-shaped female lip 34 comprises an intumed portion 36 and an outturned portion 38 extending beyond the intumed portion 36.

A sealant 39, comprising any suitable material such as putty, is disposed within the female lip 34. The male lip 32 extends into the female lip 34 and is embedded in the sealant 39 rendering the seam watertight.

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The length of the corrugated elements 26 is substantially equal to the length of the internal grid 12. Also the over-all width of the facing sheets 14 is substantially equal to the width of the internal grid 12.

Each of the facing sheets 14 may comprise a single corrugated element extending across the face of the internal grid structure 12; alternatively each facing sheet 14 may comprise a plurality of interlocking elements 26 is specifically illustrated in FIGURES 2 and 3.

Further, the interlocking elements 26 may have corrugation profiles other than that illustrated in the drawings.

Preferably the corrugated elements 26 comprise a lightweight metal such as aluminum with a vitreous enamel finish on their exposed surface which enhances their appearance. Plastic film coverings and painted coatings may be provided. Color anodized surfaces also may be provided.

Cap Member

The cap member 16, in this instance, comprises a body portion 40 having a C-shaped cross-section. Two flanges 42 project from the open side portion of the body 40. The flanges 42 are spaced apart to embrace the second frame element 20 and extend into the female lips 34 which are engaged therewith.

Preferably the cap member 16 comprises a lightweight metal such as aluminum. Further the cap member 16 may have a vitreous enamel finish on its exposed surface similar to that of the corrugated elements 26.

It should be evident that the cap member 16 could be fabricated in more elaborate cross-sectional shapes other than that herein illustrated.

Panel Assembly

The present invention provides a panel that is fabricated in components and assembled at the construction site. Illustrated in FIGURE 3 is a cross-sectional assembly view of the panel 10 and a masonry wall 44 of a building 46 having windows 48 disposed therein.

The first and second frame elements 18, 20 of the internal grid structure 12 include a web portion 50 and flange portions 52 projecting at right angles therefrom. The first frame element 18 has its web portion 50 engaged with the exterior face 47 of the building 46 and is secured therein by any suitable anchoring means such as a plurality of bolts 54. The internal grid 12 is thus maintained in a substantially normal relation with the exterior face 47.

The corrugated elements 26 are next secured to the internal grid 12 by means of fasteners such as screws 56. The first of the corrugated elements 26 to be applied are designated by the letter A—these elements forming a first pair of opposed, correlative facing sheets. These elements enclose substantially one half of the grid structure 12 and have their male lip 32 secured to the flange portions 52 of the first frame element 18 by means of the screws 56. The sealant 39 is disposed within the female lip 34 of the elements A. The next of the elements 26 to be applied are designated by the letter B—these elements forming a second pair of opposed, correlative facing sheets. These elements enclose the other half of the grid structure 12 and have their male lip 32 inserted into the adjacent female lip 34. The fasteners 56 secure the lips 32, 34 to the brace elements 22, 24. The sealant 39 is also disposed within the female lips 34 of the elements B.

The cap member 16 is secured in place with the spaced flanges 42 inserted into the female lips 34 of the elements B. Fasteners 56 secure the flanges 42 and the female lips 34 to the flange portions 52 of the second frame element 20. The cap member 16 thus serves as a trim to cover the end structure of the internal grid 12. If de-

sired the panel unit 10 may be provided with lateral supports which would tie together the adjacent panel units. The supports could comprise sheets of expanded metal screening, decorative rods and the like.

As illustrated the panel 10 is secured to the exterior face 47 at a point intermediate the windows 48 thereby providing shade from the sun for one of the windows 48. Usually, a plurality of the panel units 10 will be secured to the building in fixed, architecturally pleasing, spaced relationship to provide shade for all of the windows.

The panel unit 10 is readily adaptable for shading windows which are arranged in a variety of geometric patterns. For instance, the pattern of windows could comprise rows of vertically aligned windows in which case each of the panel unit 10 would extend from a point adjacent the top of the building wall to a point adjacent the bottom of the building wall between vertical rows of windows. Alternatively the pattern of windows could be tessellated in which case the panel units 10 may be provided in sufficient length to present individual shading for each of the windows.

In FIGURE 3 the panel unit 10 is illustrated as positioned perpendicular to the masonry wall 47. It should be evident, however, that the panel unit 10 instead could be positioned at an oblique angle with the masonry wall 47.

The panel unit 10 has been illustrated as secured to the masonry wall 44. The panel unit 10, instead, could be applied to building walls having other constructions such as metal curtain wall or metal panels.

End Closures

Elements which are used in sealing the ends of a panel are known as end closures. The use of these elements in sealing the ends of the present invention depends on the design of the building.

Frequently the design of a building is similar to that illustrated in FIGURE 4 wherein a building 58 has a roof extension 60 projecting beyond an exterior face 62. A portion of the surrounding ground 64 is also illustrated. In this instance the panel 10 extends over the full height of the building 58. The top of the panel 10 abuts the lower face of the roof extension 60. The bottom of the panel 10 abuts the ground 64. Thus no end closures are required. The top and bottom horizontal grid elements may be fastened along their length to the roof extension 60 and to the ground 64, respectively to provide additional rigidity.

However, in the case where the panels do not extend over the full height of the building or where the building has no roof extension, as shown in FIGURE 5, the panels preferably are provided with end closures. In FIGURE 5 a portion of a building 66 is illustrated with a panel 10' mounted on an exterior face 68. The panel 10' includes end closure elements 70 sealing the two ends, i.e., top and bottom. Preferably the end closure elements 70 are suitable lengths of channel corresponding to the cap member 16. The end closure elements 70 are secured in place with each of the spaced flanges interposed between the corrugated elements 26 and the horizontal brace elements 22.

Summary

It should be evident from the foregoing detailed description that the present invention provides a sunshade panel unit that may be secured to a building outer wall in shading relation with the windows therein. The present invention further provides a panel unit that is readily assembled and installed by virtue of its minimum number of parts and its simplified construction. Still further the present invention provides a panel unit that has a pleasing appearance that adds to the architectural prominence of a building.

According to the provisions of the patent statutes, I have explained the principle, preferred embodiment and mode of operation of my invention and have illustrated

and described what I now consider to represent its best embodiment. However, I desire to have it understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

I claim:

1. A sunshade panel unit comprising:

an internal unitary grid structure including a first continuous grid element secured to an exterior face of a building in fixed upright relation therewith, a second continuous grid element coextensive with said first grid element, and a plurality of brace elements extending between the said first and second grid elements whereby the said second grid element is maintained in a fixed, outwardly spaced, parallel relationship with said first grid element;

a first facing sheet comprising at least one corrugated sheet metal element having crests and valleys aligned with the said first and second grid elements, said first facing sheet being substantially coextensive with the said grid structure and being secured at one side edge to said first grid element and at the other side edge to said second grid element;

a second facing sheet comprising at least one corrugated sheet metal element having crests and valleys aligned with the said first and second grid elements, said second facing sheet being substantially coextensive with said grid structure and being correlative with the said first facing sheet, said second facing sheet being secured at one side edge to said first grid element and at the other side edge to said second grid element in opposed relation with the said first facing sheet;

and a cap member including spaced flanges which embrace the said second grid element and engage the said other side edge of said first and second facing sheets, said spaced flanges being therein secured to said second grid element.

2. A sunshade panel unit comprising:

an internal unitary grid structure including a first continuous channel shaped vertical grid element having a web portion secured to an exterior face of a building wall in fixed upright relation therewith and flange portions extending outwardly from the said web portion, a second continuous channel shaped grid element having a web portion and flange portions extending from the latter web portion, and a plurality of brace elements extending between the said first and second grid elements whereby the said second grid element is maintained in a fixed, outwardly spaced, parallel relationship with said first grid element, with said flange portions of said first grid element extending toward the flange portions of said second grid element;

a first pair of opposed, correlative, facing sheets which enclose therebetween substantially one half of said grid structure, said first pair of facing sheets comprising corrugated sheet metal elements having crests and valleys aligned with the said first and second grid elements, each of said corrugated sheet metal elements including a tongue like male lip and a U-shaped female lip on the two side edges thereof said male and female lip being coplanar and being parallel with said flange portions, the male lips of said first pair of facing sheets being secured to the flange portions of said first grid element;

a second pair of opposed, correlative facing sheets which enclose the other half of said grid structure, said second pair of facing sheets comprising corrugated sheet metal elements having crests and valleys aligned with the said first and second grid elements, each of said corrugated sheet metal elements including a tongue like male lip and a U-shaped female lip on the two side edges thereof said male and female lips being coplanar and being parallel with said flange portions, the female lips of said second

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pair of facing sheets being secured to the said flange portions of said second grid element, the male lips of said second pair of facing sheets extending interiorly of said first pair of facing sheets within the female lips of the said first pair of facing sheets and secured therein to the said brace elements;

and a cap member including spaced flanges which embrace the said second grid element and extend into the female lips of the said second pair of facing sheets, said spaced flanges being therein secured to the flange portions of said second grid element.

3. The sunshade panel unit of claim 2 wherein the said U-shaped female lips of said first pair of facing sheets are contiguous with one side edge thereof, said female lips including an intumed portion extending interiorly of said one side edge and an outturned portion extending exteriorly of said one side edge, said intumed and outturned portions being spaced apart with said outturned portion engaged with said brace elements, said tongue like male lips of said second pair of facing sheets extending between said intumed and outturned portions to a point interiorly of said one side edge, fastener means extending through the said male lip and said outturned portion for securing the said male lip and the said outturned portion to said brace elements.

4. The sunshade panel unit of claim 3 including a sealant interposed between said intumed and outturned portions of said female lips.

5. The sunshade panel unit of claim 2 wherein the said U-shaped female lips of said second pair of facing sheets are contiguous with one side edge thereof, said female lips including an intumed portion extending interiorly of said one side edge and an outturned portion extending exteriorly of said one side edge, said intumed and outturned portions being spaced apart with said outturned portions engaged with the flange portions of said second grid element, said spaced flanges of said cap member extending between said intumed and outturned portions to a point interiorly of said one side edge.

6. The sunshade panel unit of claim 5 including a sealant interposed between said intumed and outturned portions of said female lips.

7. A sunshade assembly for windows disposed in an exterior face of a building wall, comprising a plurality of spaced vertical sunshade panel units projecting outwardly from said exterior face, said panel units comprising an internal unitary grid structure including a first continuous grid element and a second continuous grid element, and a plurality of brace elements extending between the said first and second grid elements whereby the

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said second grid element is maintained in a fixed, outwardly spaced, parallel relationship with said first grid element, said panel units further including two opposed, correlative, corrugated facing sheets, said facing sheets being substantially coextensive with said grid structure and secured at their peripheral edges to the sides of said internal unitary grid structure, said facing sheets having their corrugations aligned with the said first and second grid elements, a cap member including spaced flanges which embrace the said second grid element, said flanges being secured to said second grid element with the peripheral edges of said facing sheets therebetween, and means for securing said first grid element to said exterior face in fixed upright relation therewith whereby said panel units are maintained in shading relation with the said windows.

8. A sunshade assembly for rows of vertically aligned windows disposed in an exterior face of a building wall, comprising a plurality of spaced vertical sunshade panel units projecting outwardly from the said exterior face, each of said panel units extending from a point adjacent the top of said building wall to a point adjacent the bottom of said building wall, said panel units comprising an internal unitary grid structure including a first continuous grid element and a second continuous grid element, and a plurality of brace elements extending between the said first and second grid elements whereby maintaining the said second grid element in a fixed, outwardly spaced, parallel relationship with the said first grid element, said panel units further including two opposed, correlative, corrugated facing sheets, said facing sheets being substantially coextensive with the said grid structure and secured at their peripheral edges to the sides of said internal unitary grid structure, said facing sheets having their corrugations aligned with the said first and second grid elements, a cap member including spaced flanges which embrace the said second grid element, said flanges being secured to said second grid element with the peripheral edges of said facing sheets therebetween, and means for securing said first grid element to said exterior face in a fixed upright relation therewith whereby said panel units are maintained in shading relation with the said rows of vertically aligned windows.

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