

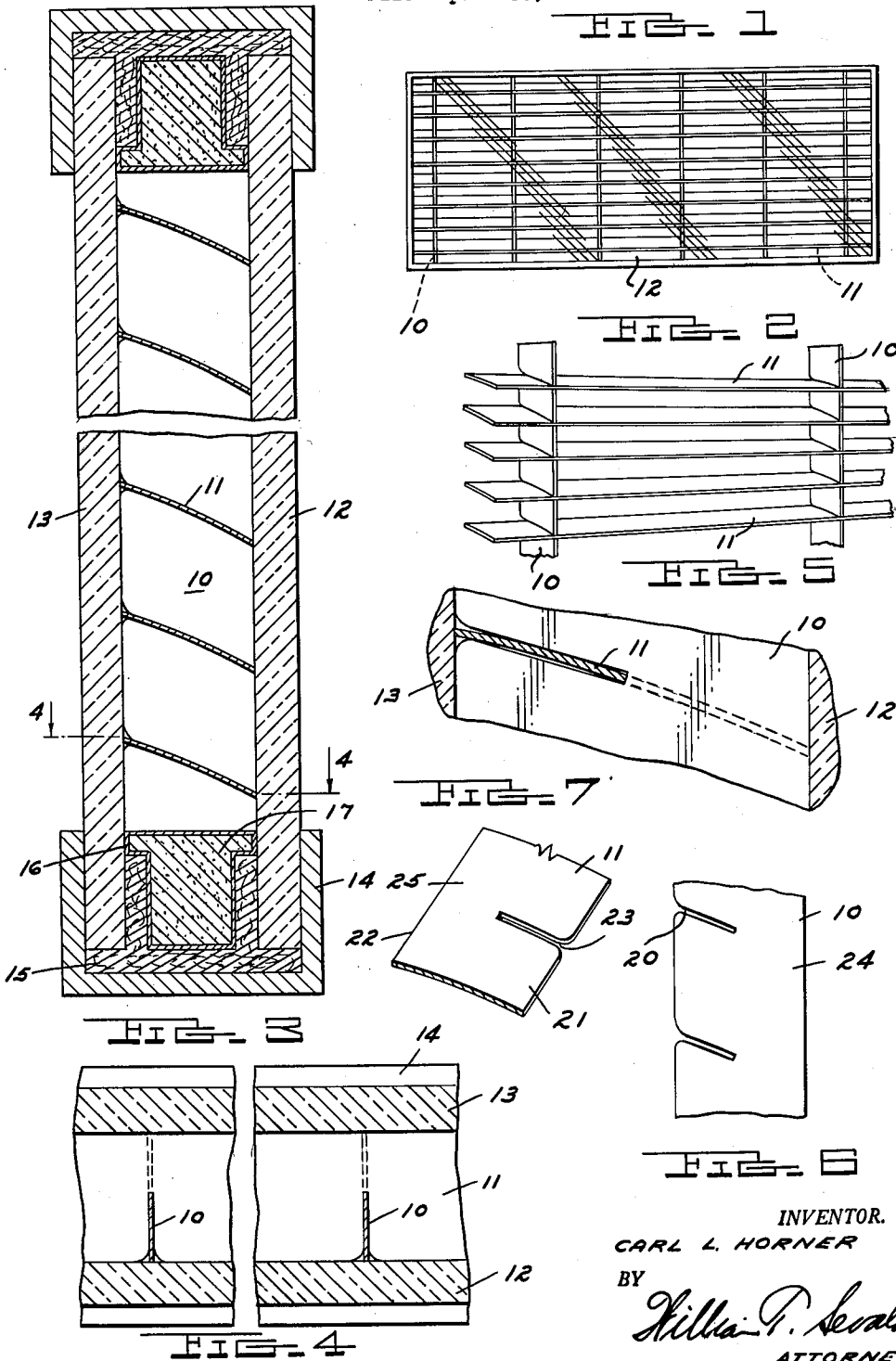
Feb. 19, 1963

C. L. HORNER

3,077,643

SUN SCREENS

Filed April 10, 1961



INVENTOR.
CARL L. HORNER

BY

William P. Sebold
ATTORNEY

1

3,077,643
SUN SCREENS
Carl L. Horner, 615 Hupp Cross Road,
Birmingham, Mich.
Filed Apr. 10, 1961, Ser. No. 101,892
3 Claims. (Cl. 20—56.5)

This invention relates to sun screens for use in conjunction with windows having double glass panels and to the combination thereof.

Screens and various shading devices have been employed heretofore to facilitate blocking the sun's rays while still permitting sufficient light, however, the several devices of the prior art have not proven entirely satisfactory inasmuch as they are complicated in design and construction, expensive to manufacture, and difficult to use.

With the foregoing in view, the primary object of the invention is to provide a sun screen for use with double panel windows which is simple in design and construction, inexpensive to manufacture, easy to use, and which installs easily, and which operates in a highly satisfactory manner.

An object of the invention is to provide a sun screen which is usable between any type or make of double window pane construction whether hermetically sealed or not.

An object of the invention is to provide vertical strips in relatively wide spaced relationship supporting horizontal strips in relatively close spaced relationship disposed at an angle rising upwardly from the outside pane to block the direct rays of the sun.

An object of the invention is to provide an inter-slotted relationship between the vertical and horizontal strips for holding the strips in the desired relationship.

An object of the invention is to provide a camber or curve in the horizontal strips so that they exert a spring pressure against the side walls of the receiving slot in the vertical strips so as to spring-wise tension the strips together.

An object of the invention is to provide reflective coating material on the vertical strips top and bottom surfaces for the purpose of reflecting and refracting the heat rays from the sun outwardly of the window unit.

An object of the invention is to provide uncoated edges on the strips in physical contact with the window panels for the purpose of transmitting any internal absorbed heat between the window panels to the window panes themselves for dissipation outwardly thereof.

These and other objects of the invention will become apparent by reference to the following description of a sun screen and double window panel construction and combination embodying the invention taken in connection with the accompanying drawing in which:

FIG. 1 is a front elevational view of the inventive device.

FIG. 2 is an enlarged partial perspective showing of a portion of the sun screen seen in FIG. 1.

FIG. 3 is a greatly enlarged cross-sectional view of the device seen in FIG. 1.

FIG. 4 is a cross-sectional view of FIG. 3 taken on the line 4—4 thereof.

FIG. 5 is an enlarged partial view of a portion of FIG. 3 showing the interslotted and webbed relationship and the spring tension between the strips.

FIG. 6 is a side elevational partial view of the vertical strip showing a portion thereof in detail; and

FIG. 7 is a perspective view of a portion of a horizontal strip showing a portion in detail.

Referring now to the drawing wherein like numerals refer to like and corresponding parts throughout the several views, the sun screen and window combination disclosed therein to illustrate the invention comprises

2

vertical support strips 10 having slots receiving the horizontal sun screen strips 11 which are also equipped with slots for cooperating with the vertical strips 10 with the horizontal strips 11 being disposed on an inclined plane upwardly and with the strips 10 and 11 in intermeshed and locked relationship. The front glass panel 12 is disposed on one side of the strips 10 and 11 and a back glass panel 13 is disposed on the other side thereof and the structure so far described is held in the assembled relationship by the edge molding 14 which is U-shaped in cross-section. Sealing material 15, spacer 16, and hygroscopic material 17 may be employed in the area of the molding 14 as is well understood in the art.

More particularly, the double window panel and sun screen combination comprises the paired spaced parallel front and back glass panels 12 and 13 having opposed inner surfaces housing a series of relatively widely spaced vertically disposed metal strips 10 for support with the edges of the vertical support strips 10 being in contact with the inner surfaces of the glass panels 12 and 13 and with each vertical strip 10 having a series of relatively close spaced slots 20 leading through one edge of each vertical strip with the slots lying in a plane angularly rising from the front panel 12 to the back panel 13.

A series of relatively close spaced horizontally disposed metal screen strips are angularly transversely positioned between the panels 12 and 13 and lie in the plane of the vertical strip slots 20 and have edges 21 and 22 contacting the inner surfaces of both glass panels 12 and 13. Each horizontal strip 11 has a series of relatively widely spaced slots 23 leading through one edge of each of the horizontal strips 11 corresponding to the spacing of the vertical strips 10.

The slots 20 and 23 have a width dimension substantially the same as the thickness of the strips and the slot 20 on the strip 10 is disposed on the opposite side of the strip 10 relative to the slots 23 on the horizontal strips 11.

The slots 20 and 23 in the strips 10 and 11 leave a reduced web portion 24 and 25 in the respective strips which lie in the slots of the other said strip and it is to be noted that the horizontal strips 11 have a rising curve or camber so that the web portion 25 lying in the slot 20 of the strip 10 spring-wise tensions itself therein preventing relative vibratory movement therebetween.

The horizontal strips preferably have a reflective coated surface on their top and bottom sides adapted to reflect solar rays back through the front glass panel 12 with a minimum of heat absorption and the camber of the strips 11 presents an upwardly convex surface which reflectively fans out the solar rays to aid in heat and light ray dissipation.

Both the vertical and horizontal strips 10 and 11 have uncoated metal edges in physical contact with both the glass panels 12 and 13 opposed inner surfaces for transmitting any absorbed solar heat from the strips 10 and 11 to both the glass panels for dissipation of the heat outwardly thereof. This physical contact also holds the strips 10 and 11 in firm interlocked relationship with the webs of each strip lying in the slots of the other strip.

In use, the wide spaced relationship of the vertical support strips 10 provides for sidewise peripheral substantially uninterrupted visual aspects while the close spaced horizontal screen strips 11 provide for maximum sun ray blocking and heat dissipation. It is to be noted that the downward view of a person through the back panel 13 is substantially uninterrupted by the horizontal strips 11 while the sun rays from a top outside angular relationship are blocked, fanned out and dissipated by the horizontal screen strips 11.

It has been found in prior art devices, that the inner position of a sun screen between the glass panels of a dual

pane window absorb and trap the light rays thereby trapping the heat between the panes causing thermal expansion and contraction and excessive changes in heating and cooling thereby destroying the seals and construction and effecting the travel of air and consequently moisture between the dual glass panels resulting in condensation and fogging of the window.

With the inventive device it has been found that since the sun heat rays are reflected, fanned out, and dissipated by the sun screen horizontal strips 11, very little heat is trapped between the glass panels 12 and 13 and what heat is trapped between the panels 13 is dissipated immediately to and through the glass panels 12 and 13 for outward radiation due to the fact that the support strips 10 and the screen strips 11 are in physical contact with their highly transmittive raw edges so that even the small amount of heat absorbed by the strips themselves is dissipated immediately through the panels 12 and 13.

Although but a single embodiment of the invention has been shown and described in detail, it is obvious that many changes may be made in size, shape, detail, and arrangement of the various elements of the invention within the scope of the appended claims.

I claim:

1. A window panel and sun screen combination comprising paired spaced parallel front and back glass panels having opposed inner surfaces, means securing said glass panels, a series of relatively widely spaced vertically disposed metal strips transversely positioned between said panels having edges contacting the inner surfaces of said panels; each said vertical strip having a series of relatively close spaced slots leading through one edge of each said vertical strip with the slots lying in a plane angularly rising from said front panel to said back panel; a series of relatively closely spaced horizontally disposed metal strips angularly transversely positioned between said panels lying in the plane of said vertical strip slots and having edges contacting the inner surfaces of both said panels; each said horizontal strip having a series of relatively widely spaced slots leading through one edge of each said horizontal strip corresponding to the spacing of said vertical strips; said slots having a width substantially the same as the thickness of said strips; said slots of said vertical strips being on the opposite side of said vertical strip relative to said slots of said horizontal strips; all said slots in both said strips leaving a reduced web portion in both said strips lying in the slots of the other said strips; said horizontal strips including said web portions having a camber spring tensioning said horizontal strip web portions in said vertical strip slots preventing relative vibratory movement therebetween; said horizontal strips having reflective coated surfaces to reflect solar rays back through said front glass panel with a minimum of heat absorption; said vertical and horizontal strips having uncoated edges in contact with both said glass panels for transmitting any absorbed solar heat to both said panels for dissipation; said contact with said glass panels holding the webs of each said strips in the slots of the other said strip; said cambered horizontal strips being upwardly convex to reflectively fan out solar rays to aid in heat and light ray dissipation.

2. A window panel and sun screen combination comprising paired spaced parallel front and back glass panels having opposed inner surfaces, means securing

said glass panels, a series of relatively widely spaced vertically disposed metal strips transversely positioned between said panels having edges contacting the inner surfaces of said panels; each said vertical strip having a series of relatively close spaced slots leading through one edge of each said vertical strip with the slots lying in a plane angularly rising from said front panel to said back panel; a series of relatively closely spaced horizontally disposed metal strips angularly transversely positioned between said panels lying in the plane of said vertical strip slots and having edges contacting the inner surfaces of both said panels; each said horizontal strip having a series of relatively widely spaced slots leading through one edge of each said horizontal strip corresponding to the spacing of said vertical strips; said slots having a width dimension substantially the same as the thickness of said strips; said slots of said vertical strips being on the opposite side of said vertical strip relative to said slots of said horizontal strips; all said slots in both said strips leaving a reduced web portion in both said strips lying in the slots of the other said strips; said horizontal strips having reflective coated surfaces to reflect solar rays back through said front glass panel with a minimum of heat absorption; said vertical and horizontal strips having uncoated edges in contact with both said glass panels for transmitting any absorbed solar heat to both said panels for dissipation; said contact with said glass panels holding the webs of each said strips in the slots of the other said strip; said horizontal strips being upwardly convex to reflectively fan out solar rays to aid in heat and light ray dissipation.

3. A window panel and sun screen combination comprising paired spaced parallel front and back glass panels having opposed inner surfaces, means securing said glass panels, a series of relatively widely spaced vertically disposed metal strips transversely positioned between said panels having edges contacting the inner surfaces of said panels; each said vertical strips having a series of relatively close spaced slots leading through one edge of each said vertical strip with the slots lying in a plane angularly rising from said front panel to said back panel; a series of relatively closely spaced horizontally disposed metal strips angularly transversely positioned between said panels lying in the plane of said vertical strip slots and having edges contacting the inner surfaces of both said panels; each said horizontal strip having a series of relatively widely spaced slots leading through one edge of each said horizontal strip corresponding to the spacing of said vertical strips; said slots having a width dimension substantially the same as the thickness of said strips; said slots of said vertical strips being on the opposite side of said vertical strip relative to said slots of said horizontal strips; all said slots in both said strips leaving a reduced web portion in both said strips lying in the slots of the other said strips; said contact with said glass panels holding the webs of each strip in the slots of the other said strip.

References Cited in the file of this patent

UNITED STATES PATENTS

1,985,966	Wood	Jan. 1, 1935
2,585,322	Bradfield	Feb. 12, 1952
2,689,026	Zingone	Sept. 14, 1954
2,849,762	McCarthy	Sept. 2, 1958