April 25, 1967 M. L. CLARK 3,315,727

SUNSHADE FOR CEILING CONSTRUCTION

Filed Sept. 16, 1963 2 Sheets-Sheet 1

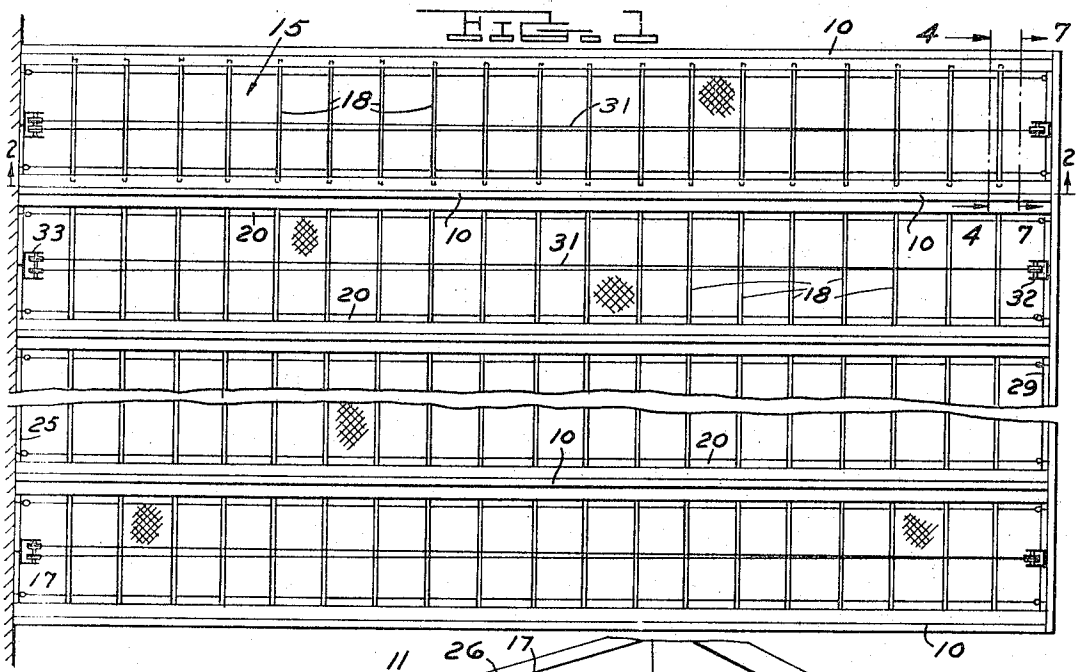


FIG. 1

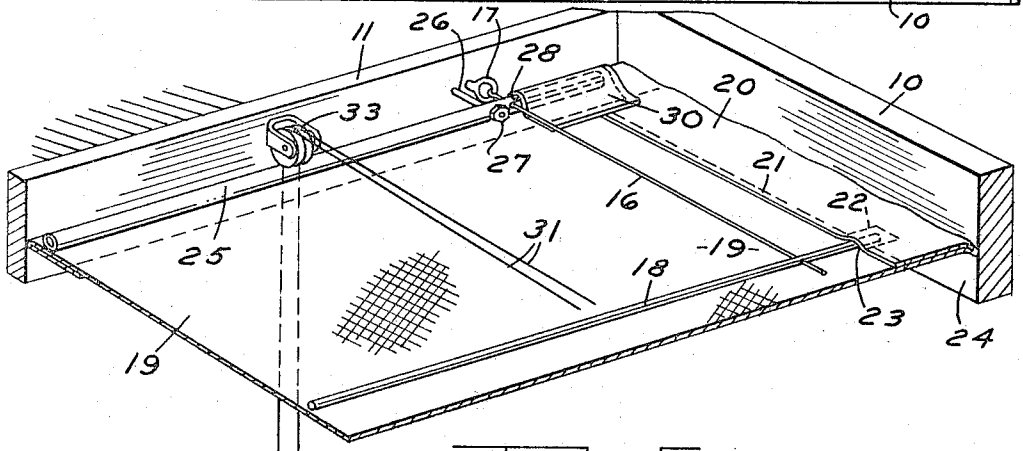


FIG. 5

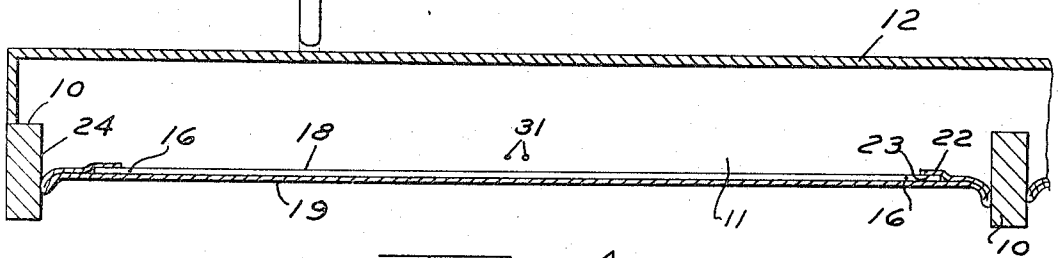


FIG. 4

INVENTOR.
MORTON L. CLARK
BY
Barnes, Kisselle, Raisch & Choate
ATTORNEYS

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SUNSHADE FOR CEILING CONSTRUCTION

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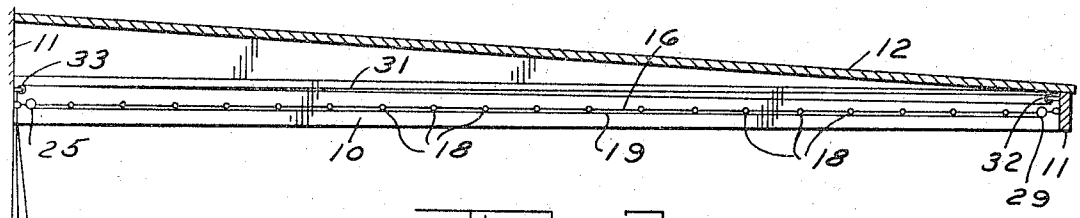


FIG. 2

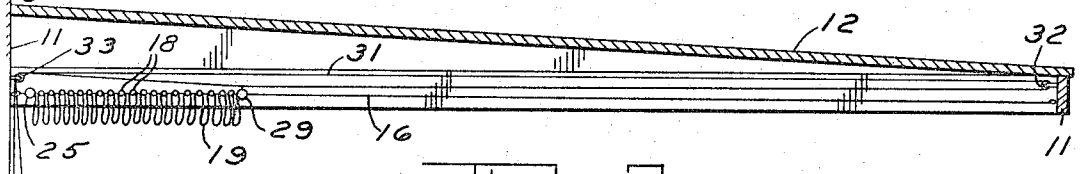


FIG. 3

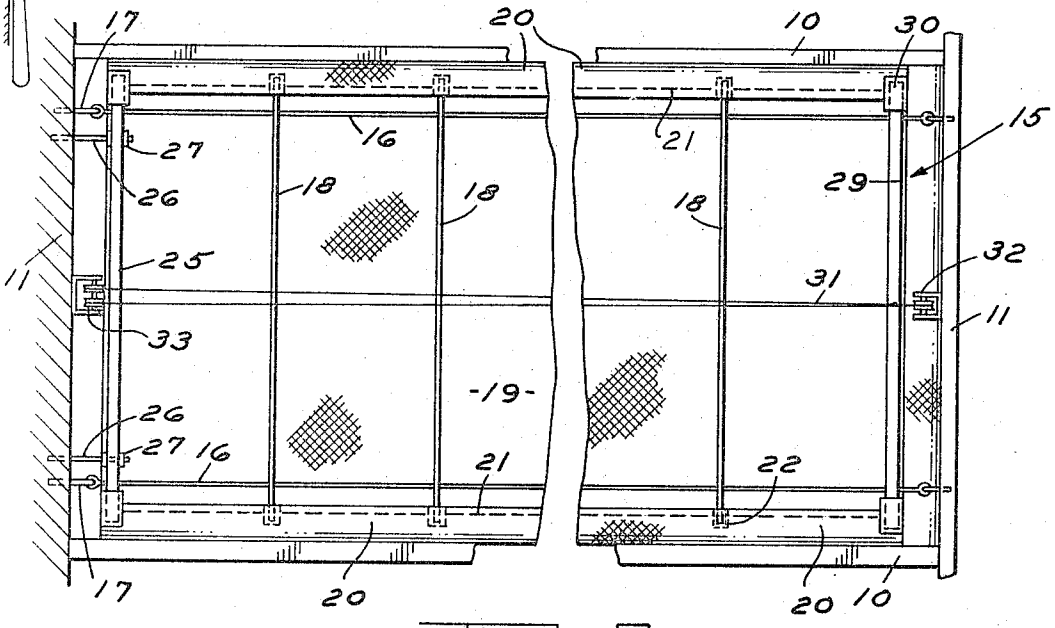


FIG. 6

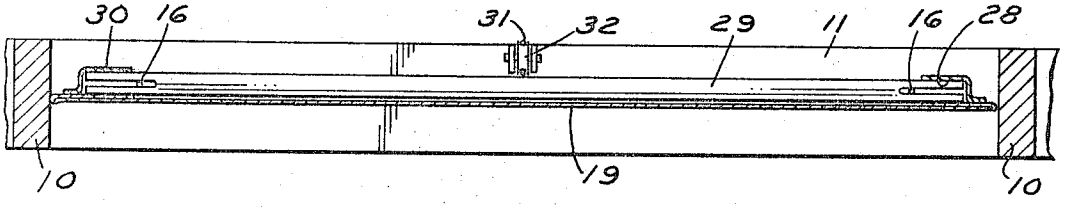


FIG. 7

INVENTOR.
MORTON L. CLARK
BY
Barnes, Kisselle, Raisch & Choate
ATTORNEYS

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SUNSHADE FOR CEILING CONSTRUCTION

Morton L. Clark, 514 Manatee Ave. W.,
Bradenton, Fla. 33505

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12 Claims. (Cl. 160—84)

This invention relates to ceiling constructions of rooms, patios and the like wherein transparent panels are provided to permit the passage of daylight and sunlight into the interior.

In such ceiling constructions, a major problem is that during some periods of the day and seasons of the year, the intensity of the sunlight passing into the interior is so great as to make it extremely uncomfortable to remain in the interior. In addition, when the interior is sealed, the sunlight tends to provide excessive heat further making the interior uncomfortable.

It is an object of this invention to provide a simple and inexpensive sun shade construction which can be readily moved into and out of position beneath the transparent panels of the ceiling to effectively minimize the passage of light to the interior thereby making the interior more comfortable.

In the drawings:

FIG. 1 is a fragmentary top plan view of a ceiling embodying the invention.

FIG. 2 is a fragmentary sectional view taken along the line 2—2 in FIG. 1.

FIG. 3 is a fragmentary sectional view similar to FIG. 2 showing the sun shade in retracted position.

FIG. 4 is a fragmentary sectional view on an enlarged scale taken along the line 4—4 in FIG. 1.

FIG. 5 is a fragmentary perspective view of a corner of the sun shade construction shown in FIG. 1.

FIG. 6 is a fragmentary plan view on an enlarged scale of one of the sun shades utilized in the ceiling construction shown in FIG. 1.

FIG. 7 is a fragmentary sectional view on an enlarged scale taken along the line 7—7 in FIG. 1.

Referring to FIGS. 1 and 5, the construction embodying the invention comprises a ceiling which is made of spaced parallel frame members 10 connected by end frame members 11. Transparent panels 12, which may be made of either rigid or flexible plastic, are provided on the frame members 10 and 11 thereby producing a transparent ceiling. In order to make the interior more comfortable during the times when the light in the interior is extremely intense or the heat from the sun is extremely intense, sun shades 15 are provided between the frame members 10. Each sun shade comprises parallel guide wires 16 that extend between the end frame members 11 and are fastened thereto by eye screws 17. The guide wires 16 are spaced from and parallel to the frame members 10. A plurality of rods 18 having openings 19 therein are threaded on the guide wires and movable longitudinally thereon.

A flexible cover 19 of opaque reflective material such as Dacron cloth is mounted on the rods so that when the rods are moved back and forth on the guide wires 16, the sun shade is extended (FIG. 2) and retracted (FIG. 3).

Specifically, as shown in FIG. 5, the ends of the cover 19 are folded as at 20 and stitched as at 21, 22 to define pocket 23 into which the ends of the rods 18 extend. The double fold on the longitudinal edges of the rods tends to stiffen the cover so that the edge of the cover thereby tends to engage the sides 24 of the frame members 10 and provide a seal against the entry of light when the sun shade is extended.

As shown in FIGS. 5 and 6, the means for extending and retracting the sun shade comprises a bar 25 which is

fastened to one of the end members 11 by pins 26 and nuts 27 extending through the bar and to the cover by an endmost pocket 28. This fastens one end of the sun shade within the ceiling between the members 10. A similar bar 29 is fastened to the other end of the cover by pockets 30 and a flexible cord 31 is connected to the bar 29. The flexible cord is trained over a single pulley 32 at one end and over a pair of pulleys 33 at the end adjacent the fixed bar 25. When the cord is pulled in one direction, the bar 29 and in turn the rods and the sun shade are collapsed or retracted to the position shown in FIG. 3 and when the cord is pulled in the other direction, the sun shade is extended to the position shown in FIG. 2.

It can be appreciated that, depending upon the nature of the flexible cover, the amount of light entering the interior can be controlled. For example, if the cover is completely opaque, then all the light passing into the interior will be excluded. On the other hand, if the cover is translucent, the light passing into the interior will be diminished. The term opaque in this application and the claims is intended to cover any flexible material which will diminish the intensity of the light passing therethrough into the interior. An important feature of the invention is that the flexible cover is made of a material that reflects ultraviolet and infrared rays. The term reflective as used in this application and the claims is intended to cover any flexible material which will diminish the passage of ultraviolet and infrared rays therethrough.

Another feature of the invention is that when the sun is not shining, during the winter, the positioning of the flexible cover causes the creation of a dead air space between the transparent panels 12 and the flexible cover that serves as a heat barrier and prevents the passage of heat outwardly. Since the flexible cover is made of a reflective material, it tends to reflect any ultraviolet and infrared rays back into the interior.

It can thus be seen that there has been provided a ceiling construction wherein a sun shade can be moved into and out of position to control the passage of light to the interior in response to the variation in light and sun intensity. The structure is efficient and relatively inexpensive.

I claim:

1. In a ceiling structure, the combination comprising a translucent ceiling, a retractable sun shade construction comprising
parallel guide wires extending adjacent said ceiling,
a plurality of movable transverse rods having openings therein adjacent and spaced from the ends thereof,
said guide wires being threaded through said openings in said rods,
a flexible opaque reflective panel,
means fastening said opaque panel to said rods,
means fastening one endmost rod to said ceiling,
and means engaging the other endmost rod of said plurality of rods and moving said rods toward and away from said first-mentioned endmost rod to collapse and extend said sun shade.

2. The combination set forth in claim 1 wherein said means for fastening said opaque panel to said rods comprises
a plurality of inwardly facing pockets along each longitudinal edge of said opaque panel,
the ends of said rods extending into said pockets.

3. The combination set forth in claim 1 wherein said means for fastening said opaque panel to said rods comprises a fold along each longitudinal edge of said opaque panel,
said fold being sewn to provide a plurality of inwardly facing pockets,
the ends of said rods being engaged with and extending into said pockets.

4. The combination set forth in claim 1 wherein said

means moving said second-mentioned endmost rod toward and away from said first-mentioned endmost rod comprises a double pulley adjacent said first-mentioned endmost rod,

a single pulley adjacent the second-mentioned endmost rod when the sun shade is extended, and flexible means trained over said pulleys and connected to said second-mentioned endmost rod for moving said second-mentioned endmost rod toward and away from said first-mentioned endmost rod.

5. In a ceiling structure comprising a translucent ceiling, a retractable sun shade construction comprising

parallel guide wires extending adjacent said ceiling,

a plurality of movable rods having openings therein adjacent and spaced from the ends thereof,

said guide wires being threaded through said openings in said rods,

a flexible opaque reflective panel,

means fastening said opaque panel to said rods.

6. The combination set forth in claim **5** wherein said means fastening said opaque panel to said rods comprises

a plurality of inwardly facing pockets along each longitudinal edge of said opaque panel,

the ends of said rods extending into said pockets.

7. The combination set forth in claim **5** wherein said means fastening said opaque panel to said rods comprises

a fold along each longitudinal edge of said opaque panel,

said fold being sewn to provide a plurality of inwardly facing pockets,

the ends of said rods being engaged with and extending into said pockets.

8. In a ceiling construction, the combination comprising a plurality of parallel generally horizontal frame members and transparent panels extending between said frame members, a retractable sun shade comprising

a pair of guide wires fixed to said ceiling and extending between and parallel to said frame members,

a plurality of movable relatively rigid transverse rods having openings therein adjacent and spaced from the ends thereof through which said guide wires are trained,

a flexible opaque reflective panel,

means for fastening said opaque panel to said rods,

the width of said panel being greater than the distance between the frame members such that the longitudinal edges of said opaque panel frictionally engage the sides of said frame members of said ceiling when the opaque panel is in extended position thereby substantially sealing the edges against the frame members and preventing the passage of light to the interior through said transparent panel.

9. In a ceiling construction, the combination comprising a plurality of parallel generally horizontal frame members and transparent panels extending between said frame members, a retractable sun shade comprising

a pair of guide wires fixed to said ceiling and extending between and along said frame members,

a plurality of movable transverse rods having openings therein adjacent and spaced from the ends thereof through which said guide wires are trained,

a flexible opaque reflective panel,

means fastening said opaque panel to said rods comprising a plurality of inwardly extending pockets in the longitudinal edges of said opaque panel into which the ends of said rods extend,

the width of said panel being greater than the distance between the frame members such that the longitudinal edges of said opaque panel frictionally engage the sides of said frame members of said ceiling when the opaque panel is in extended position thereby substantially sealing the edges against the frame members and preventing the passage of light to the interior through said transparent panel.

10. In a ceiling construction, the combination comprising a plurality of parallel generally horizontal frame members and transparent panels extending between said frame members, a retractable sun shade comprising

a pair of guide wires fixed to said ceiling and extending between and parallel to said frame members,

a plurality of movable transverse rods having openings therein adjacent but spaced from the ends thereof through which said guide wires are trained,

a flexible opaque reflective panel,

means fastening said opaque panel to said rods,

a first bar fixed to said frame members,

means fastening said bar to said ceiling,

a second bar trained on said wires,

means fastening said panel to said bars,

means engaging and moving said second bar toward and away from said first-mentioned endmost bar to collapse and extend said sun shade,

the width of said panel being greater than the distance between the frame members such that the longitudinal edges of said opaque panel frictionally engage the sides of said frame members of said ceiling when the opaque panel is in extended position thereby substantially sealing the edges against the frame members and preventing the passage of light to the interior through said transparent panels.

11. In a ceiling construction, the combination comprising a plurality of parallel generally horizontal frame members and transparent panels extending between said frame members, a retractable sun shade comprising

a pair of guide wires fixed to said ceiling and extending between and parallel to said frame members,

a plurality of movable transverse rods having openings therein adjacent and spaced from the ends thereof through which said guide wires are trained,

a flexible opaque reflective panel,

means fastening said opaque panel to said rods,

means engaging one endmost rod and fastening it to said ceiling,

means engaging and moving the other endmost rod toward and away from said first-mentioned endmost rod to collapse and extend said sun shade,

the width of said panel being greater than the distance between the frame members such that the longitudinal edges of said opaque panel frictionally engage the sides of said frame members of said ceiling when the opaque panel is in extended position thereby substantially sealing the edges against the frame members and preventing the passage of light to the interior through said transparent panel.

12. In a ceiling construction, the combination comprising a plurality of parallel generally horizontal frame members and transparent panels extending between said frame members, a retractable sun shade comprising

a pair of guide wires fixed to said ceiling and extending between and along said frame members,

a plurality of movable transverse rods having openings therein adjacent and spaced from the ends thereof to which said guide wires are trained,

a flexible opaque reflective panel,

means fastening said opaque panel to said rods comprising a plurality of pockets in the longitudinal edges of said opaque panel into which the ends of said rods extend,

means engaging one endmost rod and fastening it to said ceiling,

means engaging and moving the other endmost rod toward and away from said first-mentioned endmost rod to collapse and extend said sun shade,

the width of said panel being greater than the distance between the frame members such that the longitudinal edges of said opaque panel frictionally engage the sides of said frame members of said ceiling when the opaque panel is in extended position thereby substantially sealing the edges against the frame mem-

bers and preventing the passage of light to the interior through said transparent panels.

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FRANK L. ABBOTT, *Primary Examiner.*

J. L. RIDGILL, *Assistant Examiner.*