

[54] **INDIRECTLY LIGHTED PANELS FOR
WALLS AND CEILINGS**

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350/127

[51] Int. Cl. **F21v 5/00**

[58] Field of Search **240/1 EL, 106;**
350/126, 127; 161/62, 67, 88

[56] **References Cited**

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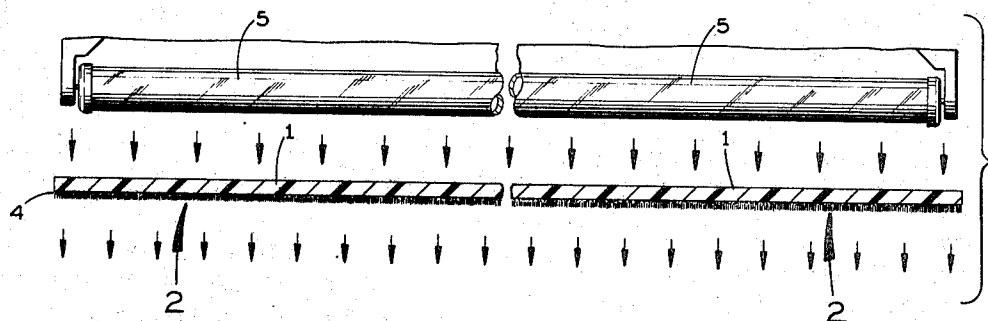
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[57] **ABSTRACT**

A lighting system for walls and ceilings wherein a plurality of transparent plastic panels of uniform thickness are positioned in adjacent edge spaced relation to a wall or ceiling surface, with each panel having secured to the outer surface thereof a compacted plurality of fiberglass pile or nap of uniform length secured substantially normal to the outer surface of the panel for uniformly transmitting artificial light positioned between the inner surface of the said panels and the adjacent wall or ceiling through said panels and from the ends of fiberglass pile.

6 Claims, 10 Drawing Figures



SHEET 1 OF 2

FIG. 1

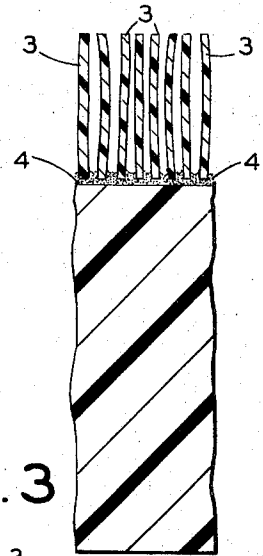
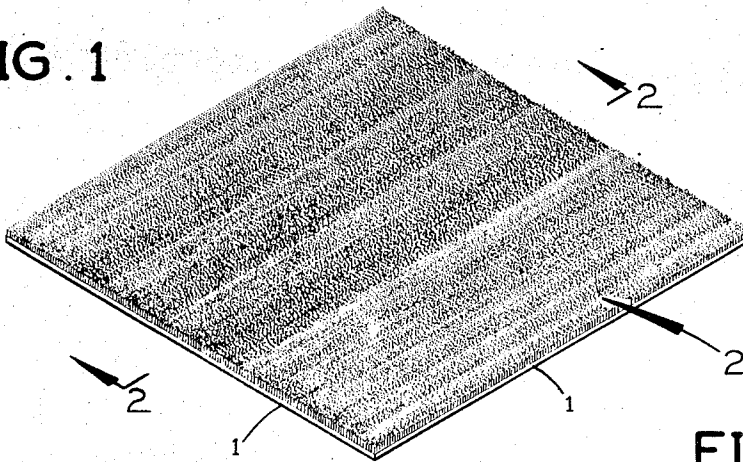


FIG. 3

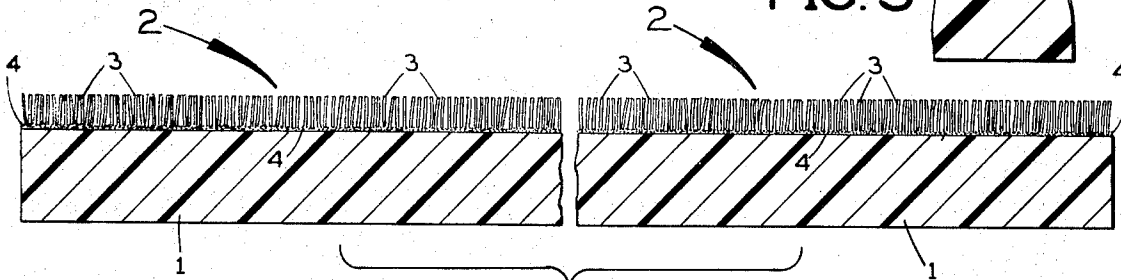


FIG. 2

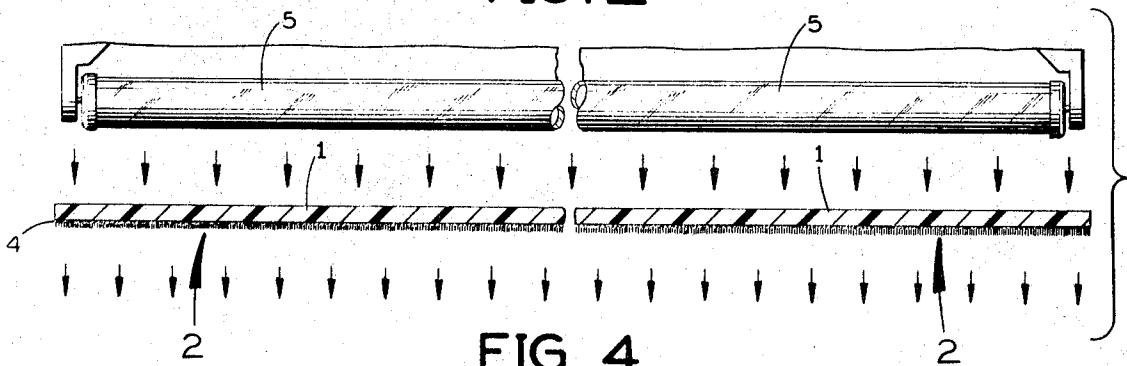


FIG. 4

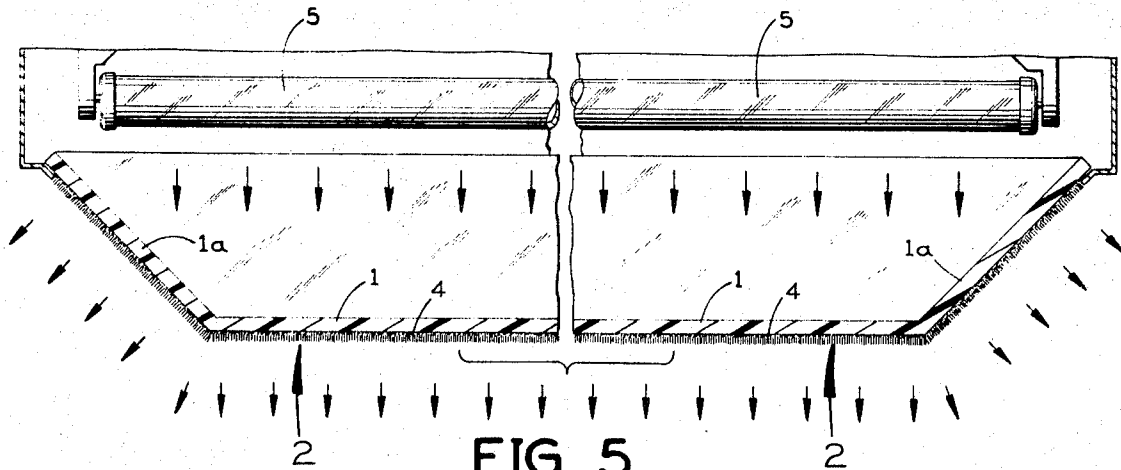


FIG. 5

FIG. 6

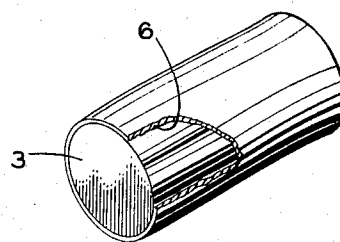
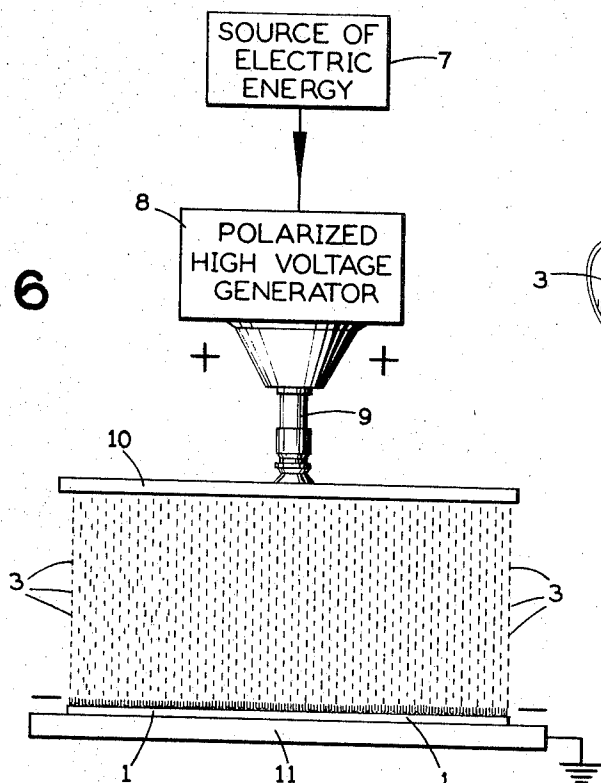


FIG. 7

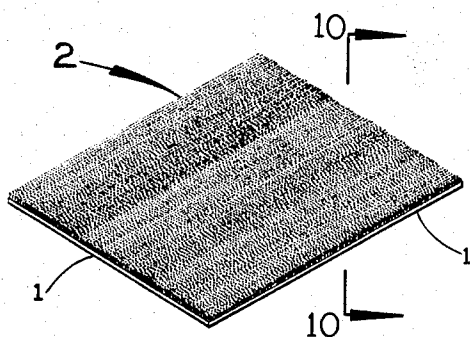


FIG. 8

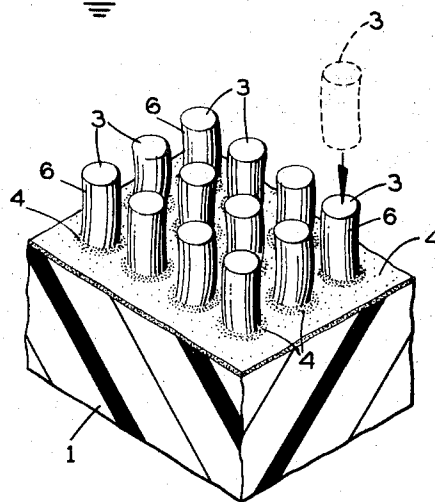


FIG. 9

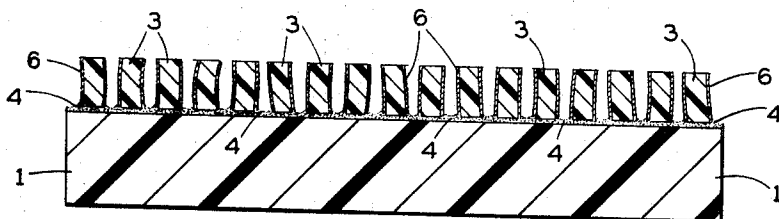


FIG. 10

INDIRECTLY LIGHTED PANELS FOR WALLS AND CEILINGS

This invention relates in general to indirect lighting apparatus and more particularly to the use of transparent panels having a pile or nap of fiberglass on the outer side thereof with conventional lighting means positioned between the rear of the panels and the walls or ceiling.

Prior indirect lighting effects were spotty and generally ineffective for the transmission of light, as well as the appearance of the light sources with respect to the decor of the room.

The present invention provides a light transmission system whereby the light from indirect sources is transmitted from an entire wall or ceiling with little if any variation, since the panels have a pile or nap of fiberglass which minimizes the visibility of the edge junctions of the panels.

The invention also comprehends the use of relatively indiscernable slots or openings, permitting air conditioning and ventilation, as well as sound transmission from loud speakers without disrupting the decor of a room.

A principal object of the invention is the provision of transparent panels having a pile or nap of fiberglass on the outer surface thereof for uniformly transmitting light from sources positioned between the rear of the panel or wall or ceiling.

Another object of the invention is the provision of a transparent panel on which fiberglass light conducting elements of predetermined length are secured to one surface thereof by adhesive means and positioned adjacent each other.

A further object of the invention is the provision of an electric process for positioning fiberglass elements of like length onto an adhesive coated surface of a transparent panel with the elements in close proximity to each other.

These and other objects and advantages in one embodiment of the invention are described and shown in the following specification and drawings, in which:

FIG. 1 is a perspective reduced scale illustration of the light transmission panel.

FIG. 2 is a fragmentary enlarged cross sectional view taken through section line 2—2, FIG. 1.

FIG. 3 is a fragmentary enlarged cross sectional view of the panel illustrating the fiberglass elements bonded to one surface thereof.

FIG. 4 is a fragmentary cross sectional illustration of a planar panel shown in FIG. 1 in reduced scale, illuminated by a tubular source positioned at the rear thereof.

FIG. 5 is a fragmentary cross sectional illustration of a multi-side formation of panels illuminated by a tubular light source. FIG. 6 is a diagrammatic illustration of electrostatic means for attaching the fiberglass elements into normal adjacent positions on the outer surface of a transparent plastic panel.

FIG. 7 is an enlarged perspective view of one of the light conducting elements shown in FIG. 3 with a portion thereof broken away.

FIG. 8 is an illustration of the positioning of the light conducting elements shown in FIG. 7, as secured to a panel by the means shown in FIG. 6.

FIG. 9 is a fragmentary perspective greatly enlarged view of the panel illustrating the deposit of the light conducting elements.

FIG. 10 is a greatly enlarged fragmentary cross sectional view of the panel, taken through section line 10—10, FIG. 8.

Referring to FIGS. 1, 2, and 3, a transparent plastic panel 1 of uniform thickness and acrylic material, such as Plexiglass or Lucite, has a large plurality of light transmitting elements 2 positioned and secured normal on one side of the panel 1 in adjacent relation, which are made up of single elements 3 which are secured to the surface of panel 1 by an adhesive 4.

The light transmitting elements are fiberglass thread or fiber cut to uniform length which ultimately forms the light transmitting nap or pile bonded normal to the surface of panel 1 by one end thereof, as shown in FIGS. 2 and 3.

It will become apparent that ordinary glass may be readily substituted for the plastic panels above described.

FIG. 4 illustrates a typical application of the light transmitting elements 2 with a tubular lamp 5, such as a Lumiline lamp.

Referring to FIG. 7, a preferred form of transmission panel including elements 3 has a color coating 6 on the cylindrical surface thereof, and the major white light is transmitted only through the exposed end of each of the elements 3, whereas a side view of the panel will show a color light effect depending upon the thickness of the coating 6 and its particular color. The light transmission from the pile with no color coating thereon is still effective with some added diffusion.

It is now apparent that with proper illumination behind each panel, they will uniformly transmit light into the bonded ends of each pile element, which will result in the longitudinal transmission of the light through each element for the outward transmission from the end of each element. Hence the panel produces a soft non-glaring but relatively uniform illumination of the wall or ceiling where used.

The manufacture of the elements first requires the color coating to the outer surface thereof, which may be a simple dipping or spraying process with a sufficiently uniform color coating of a few molecules in thickness. The fiber is then cut to a desirable length for application to the transparent panel.

Referring to FIG. 6, a source of electric energy 7 is connected to a polarized high voltage generator 8, which has a positive polarity output terminal 9 connected to a planar plate 10. A matching negative planar plate 11 is positioned in spaced relation under the plate 10 for receiving the panel 1 on its upper surface, as shown. The upper surface of the panel is then coated with a uniform layer of adhesive, such as a clear epoxy and then a quantity of elements, such as shown in FIG. 7, is dispersed on plate 10 which is aligned with plate 11, as illustrated in FIG. 8. Since the body of each pile element is negatively charged, they will align normal to the surface of panel 1 and be secured in miniscule spaced relation before the adhesive sets.

It is apparent that appropriate slots or other openings may be inconspicuously made in any selected panel for ventilation or air conditioning purposes or sound transmission from loud speakers without seriously disturbing the decor of the room.

The fundamentals of the process of producing the fiberglass pile on transparent sheet plastic begins with the application of color or dye on the fiberglass before it is cut to the desired length. When the fiberglass is cut

to equal length to form the light transmission elements described, it is first uniformly distributed onto a planar positive transfer plate which is electrically charged by high voltage, preferably of positive polarity, which with some agitation will cause the fiberglass elements to project normal to the surface of the plate in close parallel relation because of their like electric charge.

A further step involves a thin adhesive coating, such as clear transparent epoxy, on the entire outer surface of the transparent panel. The panel is then placed on a planar plate which is in spaced mating relation with the transfer plate, and then the latter is lowered into close proximity with the transparent panel, which will induce the fiberglass pile elements to transfer to the epoxy coated panel because of the attraction of unlike electric charges. Thus the pile is formed on the surface of the transparent panel, which will permanently anchor thereon as the adhesive is cured.

It is obvious that the above outlined process is applicable to production procedures, such as the provision of the automatic sequentially operating equipment for accommodating the quantity manufacture of the panels.

It is to be understood that certain modifications in construction is intended to come within the teachings and scope of the above specification.

Having described my invention, I claim:

1. The process of producing a transparent panel having a substantially uniform nap of light conducting fibers secured in substantially normal position with respect to the outer surface of said panel comprising a first step of coating the outer surface of said panel with a transparent self curing adhesive of uniform thickness, a second step of cutting predetermined lengths of fiberglass into short elements of substantially uniform length, a third step of transferring by electrostatic means a quantity of said fiberglass elements onto said adhesive coated surface of said panel by bonding one

end of each said element by said adhesive onto said panel with each element substantially normal to said surface of said panel and in close proximity with adjacent elements for forming a nap on said panel when said adhesive is cured.

2. A light conducting panel of substantially uniform thickness for diffusing light from an electric lamp when the latter is energized, said light conducting panel comprising:

- a transparent panel of rigid material and predetermined substantially uniform thickness having front and rear surfaces,

- a coating of transparent adhesive on the front surface of said panel,

- a large plurality of light conducting fiberglass elements of substantially uniform length with one end of each thereof secured by said adhesive in a position normal to the said front surface of said panel and in close substantially parallel relation to each other forming a light conducting pile over the entire area of each said panel whereby electric illumination positioned in proximity with the rear said surface of said panel will be substantially uniformly dispersed from said pile over the entire front surface of said panel.

3. The construction recited in claim 2 wherein the outer surface of each of said fiberglass elements is colored with an adherent thin coating of predetermined color for applying a color characteristic to the light emission of said panel when the rear surface thereof is illuminated by an electric lamp.

4. The construction recited in claim 2 wherein the said adhesive is a self curing adherent epoxy cement.

5. The construction recited in claim 2 wherein the said panel is formed of acrylic plastic material.

6. The construction recited in claim 2 wherein the panel is formed of transparent glass.

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