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R. E. BYRNE, JR., ETAL

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LIGHT DIFFUSING PANELS

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2 Sheets-Sheet 1

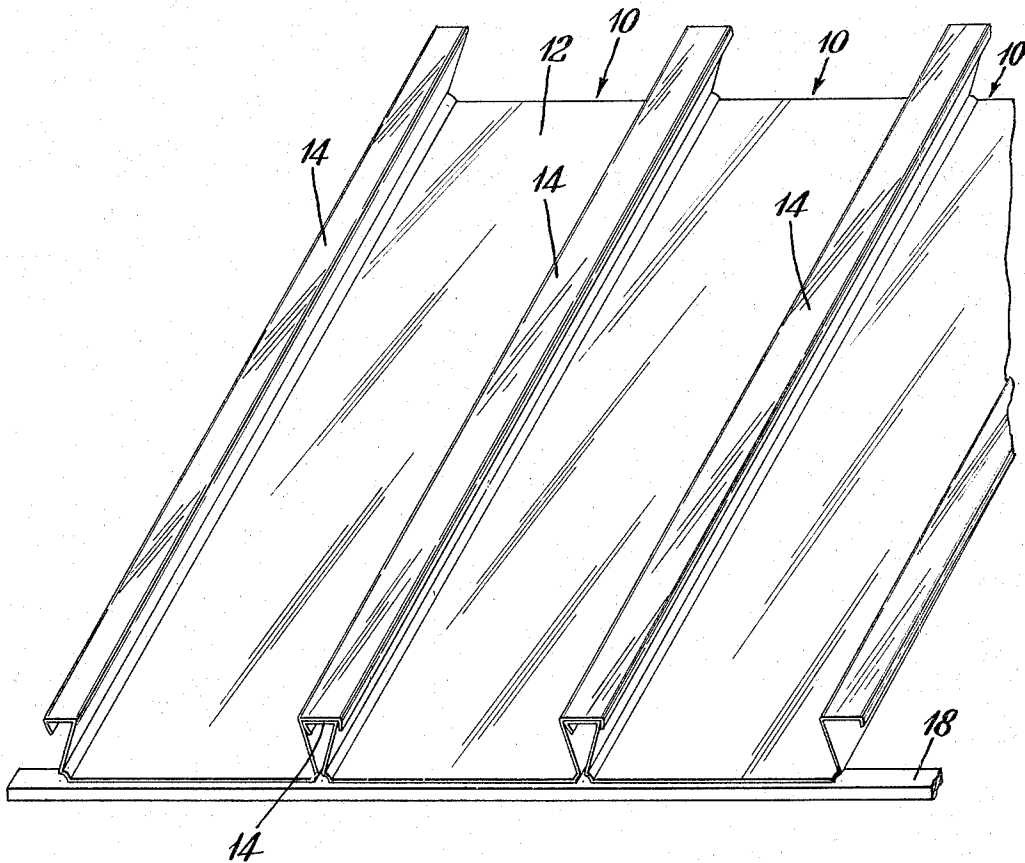


Fig. 1.

INVENTORS
ROBERT E. BYRNE, JR.
ALFRED R. TAVAROZZI

BY *Walter C. Keller*
ATTORNEY

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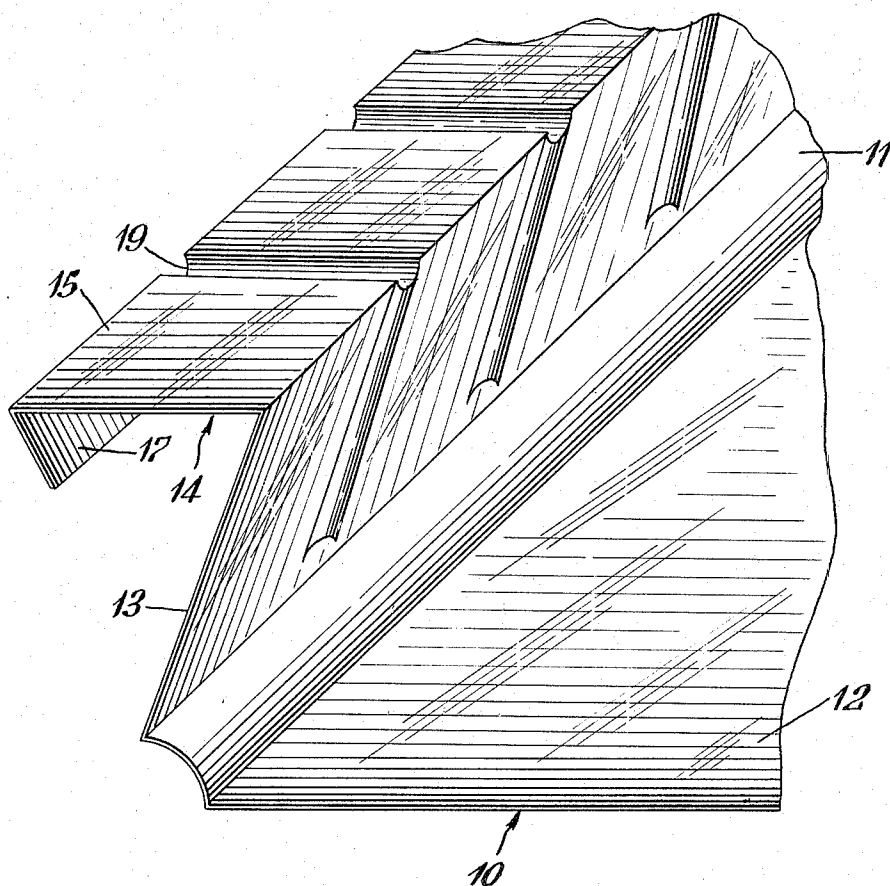


Fig. 2.

INVENTORS
ROBERT E. BYRNE, JR.
ALFRED R. TAVAROZZI

BY *Matter C. Kelm*
ATTORNEY

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LIGHT DIFFUSING PANELS

Robert E. Byrne, Jr., Martinsville, and Alfred R. Tavarozzi, Somerville, N.J., assignors to Union Carbide Corporation, a corporation of New York

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This invention relates to self-supporting translucent plastic panels for a light diffusing panel system which interlock or engage at their longitudinal edges and are supported at opposing lateral ends.

A considerable number of systems have been devised in the use of translucent plastics as ceiling light diffusers. These light diffusers have usually taken the form of a series of translucent plastic panels, normally of a low thickness, to be effectively translucent. This has resulted in a flexible plastic panel which has required substantial support when installed, such as a hanging supporting framework, such as a grid or ladder work, to hold the whole panel in the plane of the ceiling and prevent bowing-out and distortion. The cost of this framework has been high and the installation thereof has been time consuming and added further expense. Moreover, the flexibility of the panels has kept the allowable size of the panels relatively small causing installation to be a multiple-step operation, resulting in high cost of materials and installation. The additional labor involved has caused this type of lighting to be effectively withheld from residential construction. There is a considerable need and market for a translucent panel system that has substantially none of these shortcomings and is commercially inexpensive and available for residential housing.

Accordingly, it is an object of this invention to provide a translucent panel system that requires little or no special supporting framework.

It is another object of the invention to provide a translucent panel system that can quickly and readily be installed and where any desired panel may be easily removed for cleaning.

It is still another object of this invention to provide a translucent panel system that may be installed as low as one-half the cost, per square foot of the conventional luminous ceiling.

These and other objects are accomplished in the present invention which provides a light diffusing panel structure comprising at least one elongated translucent plastic panel, the longer sides of said panel comprising opposed longitudinal flanges, each of said flanges having an upwardly extending portion disposed at an acute angle with the normal plane of the plastic panel and a second portion integral with said upwardly extending portion and comprising an outward lateral extension thereof, each of said flanges adapted to engage with like flanges of adjacent panels and provide longitudinal reinforcement to each of said panels, said panel being adapted to be supported at the lateral ends thereof.

Various embodiments of the ceiling panels and their arrangements in interlocking relation are possible in this invention as will be set forth in the following description and drawings, in which:

FIGURE 1 is a perspective view of three translucent panels embodying the invention in interlocking relationship.

FIGURE 2 is an enlarged fragmentary perspective view of a panel embodying the invention illustrating embodiments of the folds of a flange.

Referring now to the drawings, the translucent panel system embodying the invention, as shown in FIGURES 1 and 2, comprises a series of panels 10, each having a planar surface 12 integral with longitudinal flange 14.

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Flange 14 comprises upwardly extending surface 13, top surface 15 and downwardly extending surface 17 which cooperate with and engage a similar flange of an adjacent panel and hold adjacent panels together as shown in FIGURE 1 to provide high longitudinal reinforcement. Surface 17 is one means by which a flange may be adapted to engage with a similar flange though other modifications are apparent, including the omission of said surface.

In a preferred embodiment, illustrated in FIGURE 2, the panel 10 comprises planar surface 12 integral with convex surface 11 which is integral in turn with shaped flange 14 comprising surfaces 13, 15 and 17.

The panels 10 embodying the invention may readily be supported as shown in FIGURE 1 by trim or molding 18 affixed to a wall or other support so that the panel system is interposed between light source and room to provide a luminous ceiling.

The translucent panel system of the invention is preferably a ceiling system but it may also be adapted to use as a luminous wall panel. The panel could be fastened to the wall, for example, by nails through the flanges or other convenient means.

The longitudinal flanges embodied in the invention may take a number of different shapes but the basic shape is substantially that of arabic figure 7 at the left longitudinal edge and a reverse arabic figure 7 at the right longitudinal edge to give on each panel at least two outward facing flanges which interlock and support and strengthen the entire ceiling unit without support means other than end supports.

The shape of each flange may be as described above but the longitudinal folds thereof may be creased, rounded or post formed. Moreover, the flanges may have additional longitudinal folds or ridges for greater longitudinal stiffness. One such configuration is illustrated in the preferred embodiment shown in FIGURE 2 where panel surface 12 and 13 come together in which the apex is backfolded in a longitudinal arch or convex surface 11. The arch and the longitudinal folds are important features of the invention in that stiff panel lengths of up to eight feet or more are made possible.

The panels are held together by the flanges in a regular unit and need no framework for longitudinal support but are supported at the opposing lateral ends of each of the panels by resting, for example, on a wall molding, or other simple support means. Thus the translucent panel system embodying the invention may be installed quickly and at a low cost. Moreover, the panels of the invention may be readily installed by one of ordinary skill. And for cleaning purposes any desired panel may be quickly and easily removed.

For greater lateral strength and width the panels embodying the invention may be provided with corrugations 19 in the flanges as shown, for example, in FIGURE 2 or in the planar surface thereof. The corrugations may be of practically any pattern, regular or irregular and may be accompanied by dimples or by other decorative indentations for decorative or strengthening purposes. Examples of possible patterns are gridwork, diamonds, triangles, grooves, circular forms and the like. Preferably the corrugations stop short of at least the planar folded edge in order not to detract from the longitudinal rigidity thereof.

The panel embodying the invention is preferably rectangular in shape, with the longitudinal flanged sides considerably longer than the remaining lateral sides or ends. But the panel shape could be other polygon shapes or even partially circular in accordance with design and room requirements.

A preferable panel material is a rigid polyvinyl chloride light diffusing sheeting about .015 inch thick. Obviously

any other translucent plastic or similar material, in varying thicknesses, can be used in this invention.

The above low thickness of the panel is made possible by the reinforcing quality of the longitudinal flanges. The resulting low cost of material and the ease of installing the luminous panel system of the invention contribute to the unusually low overall cost thereof.

What is claimed is:

1. A light diffusing panel structure comprising at least one elongated light diffusing plastic panel, each of the longer sides of said panel folding longitudinally and convexly upward and outward, said longer sides then folding upward and inward and terminating in substantially opposed flanges, each of said flanges having an upwardly extending portion disposed at an acute angle with the normal plane of the plastic panel and a second portion integral with said upwardly extending portion and comprising an outward lateral extension thereof, each of said flanges adapted to engage with like flanges of adjacent panels and provide longitudinal reinforcement to each of said panels, said panel being adapted to be supported at the lateral ends thereof.

2. A luminous ceiling comprising a plurality of panels of claim 1 where said panels inter-engage by means of said flanges and rest on abutments at the ends of said panels.

3. A light diffusing panel structure comprising at least one elongated light diffusing plastic panel, each of the longer sides of said panel folding longitudinally upward and outward, said longer sides then folding upward and inward and terminating in substantially opposed longitudinal flanges, each of said flanges having an upwardly extending portion disposed at an acute angle with the normal plane of the plastic panel and a second portion integral with said upwardly extending portion and comprising an outward lateral extension thereof, said flanges being provided with a plurality of corrugations therein, each of said flanges adapted to engage with like flanges of adjacent panels and provide longitudinal reinforcement to each of said panels, said panel being adapted to be supported at the lateral ends thereof.

4. A light diffusing panel structure comprising at least one elongated light diffusing plastic panel, each of the longer sides of said panel folding longitudinally upward

and outward, said longer sides then folding upward and inward and terminating in substantially opposed longitudinal flanges, each of said flanges having an upwardly extending portion disposed at an acute angle with the normal plane of the plastic panel and a second portion integral with said upwardly extending portion and comprising an outward lateral extension thereof, each of said flanges adapted to engage with like flanges of adjacent panels and provide longitudinal reinforcement to each of said panels, said panel having a plurality of lateral corrugations and being adapted to be supported at the lateral ends thereof.

5. A light diffusing panel structure comprising at least one elongated light diffusing plastic panel, each of the longer sides of said panel folding longitudinally upward and outward, said longer sides then folding upward and inward and terminating in substantially opposed longitudinal flanges, each of said flanges having an upwardly extending portion disposed at an acute angle with the normal plane of the plastic panel and a second portion integral with said upwardly extending portion and comprising an outward lateral extension thereof, each of said flanges adapted to engage with like flanges of adjacent panels and provide longitudinal reinforcement to each of said panels, said panel having a plurality of corrugations and dimples and being adapted to be supported at the lateral ends thereof.

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NORTON ANSHER, *Primary Examiner.*

J. F. PETERS, JR., *Assistant Examiner.*