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Mabrey et al.

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[54] **DISPLAY SYSTEM FOR LARGE COLOR TRANSPARENCIES**

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[73] Assignee: **Globe Glass Manufacturing Co.**, Elk Grove Village, Ill.

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[52] **U.S. Cl.** ..... **40/106.1**, 40/132 R, 40/135, 161/5

[51] **Int. Cl.** **G09f 13/10**

[58] **Field of Search** ..... 40/106.1, 135, 132 R; 161/5, 6, 199, 3.5

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[57] **ABSTRACT**

An illuminated display for large color transparencies includes a cabinet for housing a light source and providing a front opening. A laminate is mounted in the opening including front and rear sheets of clear plate glass, a color film transparency interposed between the glass sheets, a clear adhesive securing the transparency to the front sheet of glass, and a light-diffusing adhesive securing the transparency to the rear sheet of glass. The laminate forms a display medium which has the features of safety glass and which affords long-lasting protection for the transparency, yet it is economical enough that it may be replaced if desired without substantial replacement or installation costs.

2 Claims, 3 Drawing Figures

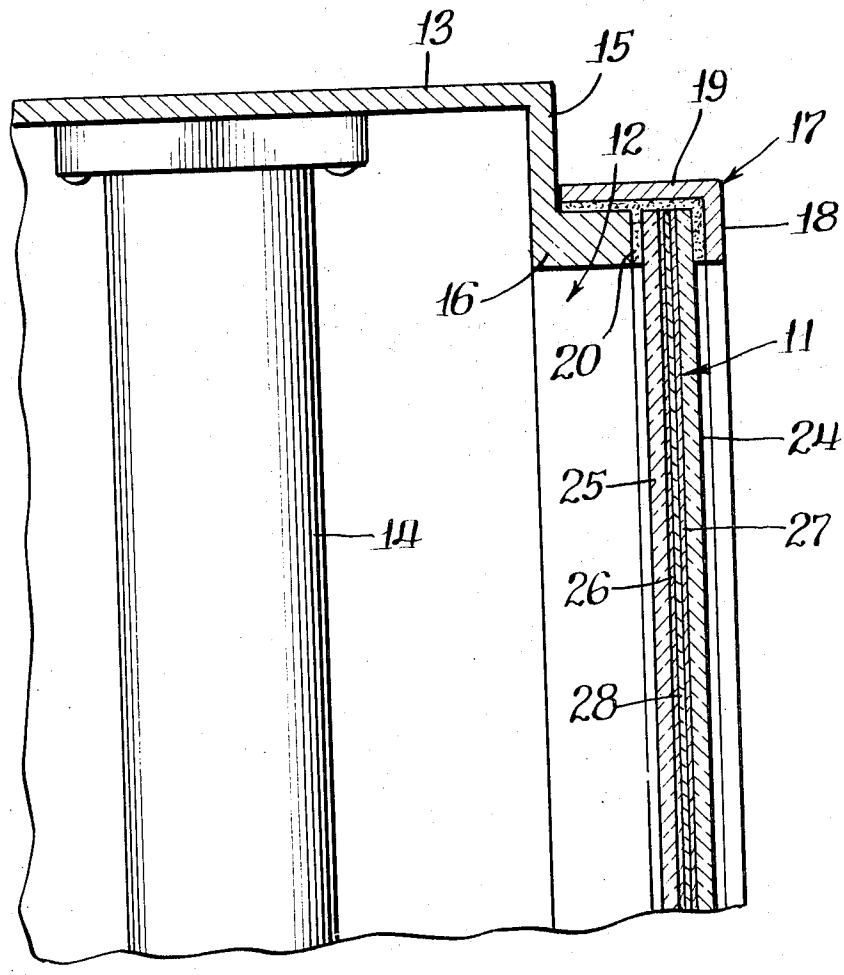


Fig. 1.

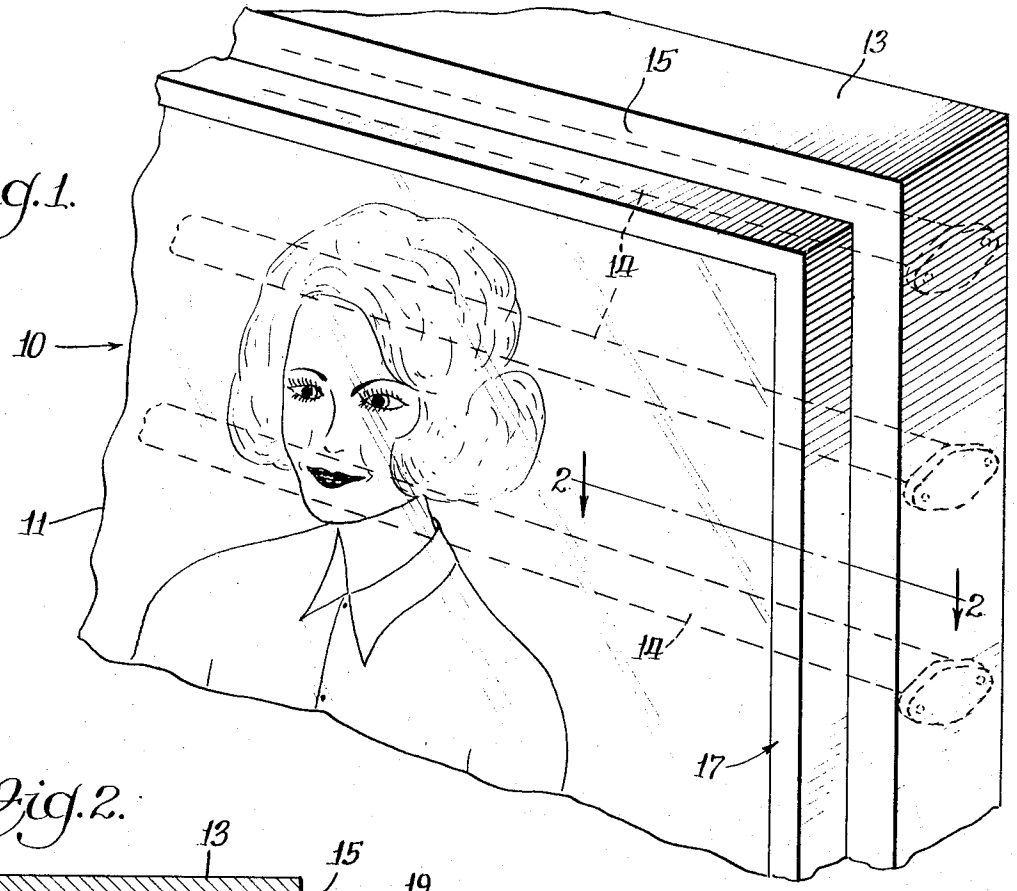
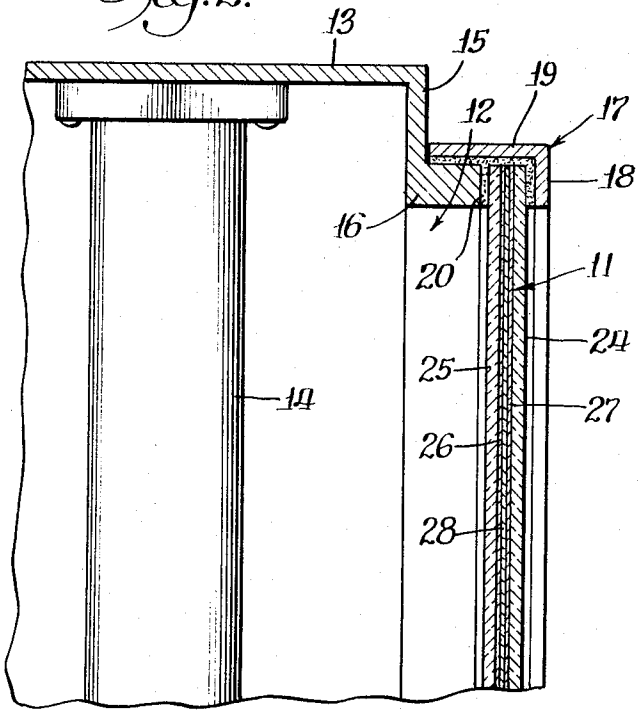


Fig. 2.



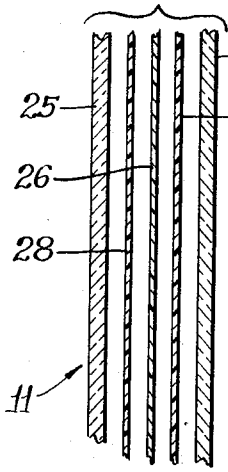


Fig. 3.

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DISPLAY SYSTEM FOR LARGE COLOR TRANSPARENCIES

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to display systems of the type used, for example, in advertising. In particular, it relates to a system for displaying large color transparencies which are illuminated from the rear, either by artificial means or by natural sunlight.

Color transparencies of the type with which the present invention is concerned are normally large in size; and they are displayed in locations where they are visible to large crowds of people, such as at airports and the like. They may be used for advertising or simply to display a pleasant scene captured in a photograph.

2. Known Systems

One system which is currently commercially available for displaying large color transparencies of this type includes a housing with a faceplate of clear plastic material behind which the transparency is mounted. The transparency is formed with a peripheral border that does not contain any portion of the picture being displayed. Slots are formed in this border, and hook-shaped clamps are inserted in the slots and connected to the side of the housing by means of springs under tension. Behind the transparency is a second layer of plastic which diffuses light from a source mounted behind it within the housing.

This method of displaying large color transparencies mounts the transparency as a separate element by means of a plurality of spring-biased clamps to keep the transparency under tension in order to prevent sagging or unevenness in the transparency which would distort the picture being displayed.

Because the housing within which transparencies have been mounted contained the light source, the housings are ventilated, thus causing a continuous flow of air through the housing. Any dust or dirt particles in the air have an affinity toward the film transparency and stick to it. After a period of time, this dirt builds up and the image displayed on the transparency begins to lose its clarity. Further, even though tension is applied evenly to the periphery of the transparency, because of its large size and the heat within the box, the transparency has a tendency because of the heat in the cabinet to develop furrows or wrinkles which distort the image, particularly when viewed from the side.

In this system it is expensive and difficult to change the transparency when desired because of the mechanism which suspends it and tensions it within its cabinet. The cabinet must be somewhat large in depth because the diffusion plate and transparency are mounted separately and because of the clamping mechanism necessary to hold the transparency.

SUMMARY OF THE INVENTION

In the present invention, a large color transparency is formed into an integral laminate with two sheets of clear plate glass. The transparency is secured to the front sheet with a clear adhesive, and it is secured to the rear sheet of glass with a light-diffusing adhesive. Thus, in one integral structure there is formed a transparency together with a glass face plate and a light diffusion medium behind the transparency. Further, this laminate is economical enough so that it may be disposed of in its entirety when it is desired to discard the transparency.

The transparency is protected against dust and dirt and against sagging or wrinkling during its entire lifetime because it is rigidly secured between the glass sheets which lend body and rigidity to it.

Replacement of the transparency simply entails replacement of the face plate, and this presents a substantial improvement over replacing transparencies in the above-mentioned prior system requiring attachment of spring-biased clamping means about the periphery of the transparency.

Another important advantage of the present invention is that the color of film is protected against humidity which has adverse effects on unprotected film used for color transparencies. The overall depth of the cabinet is substantially reduced because other than the tubes, the only element that need be present in the cabinet is the laminate.

It is desirable to use glass in display systems of this type because of its resistance to scratching. However, plastics have been used as face plate panel because they do not shatter if dropped or broken. The present invention, by making a laminate of two sheets of glass held together by the plastic film transparency forms a safety glass which is shatterproof, and it thus becomes much more attractive both from an aesthetic point of view and from a safety point of view.

Other features and advantages of the present invention will be apparent to persons skilled in the art from the following detailed description of a preferred embodiment accompanied by the attached drawing wherein identical reference numerals will refer to like parts in their various views.

The Drawing

FIG. 1 is a fragmentary view, taken in perspective, of a display system incorporating the present invention;

FIG. 2 is a fragmentary view, taken in horizontal cross section through the sight line 2—2 of FIG. 1; and

FIG. 3 is an exploded view of the elements in fragmentary form which make up a display laminate according to the present invention.

Detailed Description

Turning first to FIG. 1, reference numeral 10 generally designates a display system for a large color transparency, the one in the illustration depicting a girl. The display system 10 includes a laminated front panel 11 which will be described in greater detail below which is secured in the front opening 12 (see FIG. 2) of a cabinet 13. Mounted within the cabinet 13 behind the faceplate laminate 11 are a plurality of fluorescent tubes 14 spaced in vertical relation to establish a uniform field of illumination behind the transparency being displayed. The number of fluorescent tubes 14 is not critical, and they may be lighted and supported in any suitable manner within the cabinet 13.

The cabinet 13 includes a perimetric front flange 15 extending inwardly from the sides thereof and terminating in a forwardly extending reduced sidewall portion 16 which defines the opening 12 in which the transparency is mounted.

The transparency laminate is held to the cabinet 13 by means of a frame 17 (preferably a plastic extrusion) which is L-shaped in cross section and includes, for each side, a front flange 18 integrally formed with a

backwardly extending skirt **19** which fits around the outside of the reduced sidewall **16.** The skirt **19** may be removably secured to the projecting wall **16** by means of set screws. The peripheral edges of the laminate **11** are held between the front flange **18** of the frame **17** and the front edge of the reduced sidewall **16,** as illustrated in FIG. **2;** and these peripheral edges are encompassed with a felt or other fibrous, flexible material **20** in order to prevent light leaks at the edges of the laminate **11.**

Turning now to FIG. **3,** the laminate **11** is shown with its component elements in exploded form. It includes a front and a rear sheet of clear plate glass designated respectively **24** and **25.** Between the sheets of plate glass **24, 25,** there is located a color film transparency **26.** Between the transparency **26** and the front glass sheet **24** there is a film of clear adhesive **27;** and between the transparency **26** and the rear plate glass sheet **25** there is a film of light diffusing adhesive **28.**

In a preferred embodiment, the thickness of each of the glass sheets **24, 25** is one-eighth inch. The color transparency **26** is a 0.07 in. color print film photo transparency of the type manufactured and sold by Eastman Kodak Company. It has an acetate base. The adhesive film **27** is preferably a clear 0.015 in. thick polyvinyl butyral film marketed under the trade name, Saflex, by Monsanto Chemical Company. The adhesive film **28** is a similar 0.015 in. thick translucent white polyvinyl butyral film marketed under the trademark, Saflex, by Monsanto Chemical Company.

In preparing the laminate, the elements are first placed together in the relationship illustrated in FIG. **3** and with adjacent elements in contact. The exterior glass sheets are then pressed under a pressure of about 60 psi to force out any trapped air. Next, the laminate is conveyed through an oven having a temperature of about 600°F. and left in the oven only sufficient to cause the film transparency **26** to reach a temperature of about 180°F. This, however, softens the adhesive films **27, 28** so that they begin to commence adhesive action. Next, the laminate is autoclaved in air at a temperature of 275°F. and pressed by rollers to apply 175 lbs. per square inch of pressure, thus bonding the five elements together.

When the laminate cools, it is formed into an integral, non-separatable element which, if the glass plates **24, 25** conform to safety codes, forms a safety glass which will not shatter if broken. The transparency **26** is permanently protected against humidity, dust and dirt by virtue of the laminate that has been formed.

Further, since glass has a lower transmission of uv light, the transparency will retain its color longer; it is known that uv light causes deterioration of the color.

The laminate thus formed, of course, need be the only element placed in the cabinet since it carries the transparency as well as a light diffusion medium and protective glass sheets. The glass, as already mentioned, is much more resistant to scratching than is plastic such as has been used as a faceplate panel in prior systems of this type.

The transparency is rigidly held in a flat plane by means of the laminate that has been formed, so it does not distort or become furrowed even in relatively intense heat. The laminate is economical enough so that it may be disposed of as a whole, and the system is still competitive with existing commercial systems because of the much reduced installation costs. That is, not only is the transparency easily handled in the combination of the laminate, but there is no requirement to clamp the transparency about its periphery and induce tension across it. Finally, the depth of the cabinet may be substantially reduced relative to the above-described existing system because there is no need to provide space for a separate hanging of the transparency, and no space is required for a separate mounting of the light diffusion medium.

By forming the frontal flange **15** about the periphery of the cabinet, the fluorescent tubes **14** may be used a longer time because when a fluorescent tube begins to burn out, it becomes dim at its two ends. The frontal flange **15** thus has the effect of hiding the dimmer portions of a tube that is beginning to deteriorate, causing the appearance of a more uniform light field behind the transparency and light diffusing medium.

Having thus described in detail a preferred embodiment of the inventive system for displaying color transparencies, persons skilled in the art will be able to substitute elements equivalent to those which have been described and to modify certain of the structure and materials disclosed while continuing to practice the inventive principle; and it is, therefore, intended that all such modifications and substitutions be covered as they are embraced within the spirit and scope of the appended claims.

We claim:

1. A display system comprising: a cabinet provided with a front opening; a source of illumination mounted in said cabinet; and integral laminate including inner and outer layers of glass, a photographic color transparency of plastic sheet material between said layers of glass, clear adhesive means between said color transparency and said outer layer of glass, and translucent white adhesive means between said transparency and said inner layer of glass, said layers of glass, said adhesive means and said transparency being formed into said integral laminate substantially throughout the surface area of said transparency, whereby said laminate forms a safety glass and light from said source is diffused by said white translucent adhesive means prior to passing through said color transparency; and frame means for mounting said laminate to said cabinet side wall to cover the front opening thereof while preventing peripheral light leaks from said laminate.

2. The apparatus of claim **1** wherein said clear adhesive means and said translucent white adhesive means are each thin films of polyvinyl butyral film securing said laminate together through the application of heat and pressure.

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