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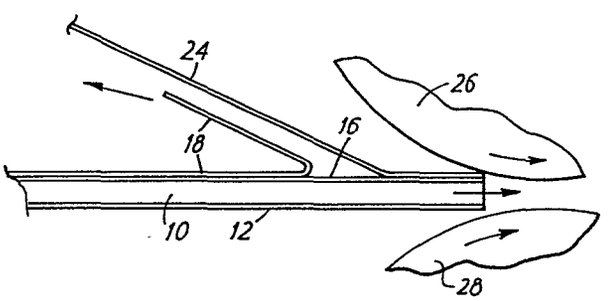
(71) Applicant: **Dobson, Charles Edward, Rambles Knole Park, Almondsbury, Bristol (GB)**

(72) Inventor: **Dobson, Charles Edward, Rambles Knole Park, Almondsbury, Bristol (GB)**

(74) Representative: **Armitage, Ian Michael et al, MEWBURN ELLIS & CO. 2/3 Cursitor Street, London EC4A 1BQ (GB)**

(54) Display panels.

(57) A rigid transparent panel (10) has a peelable protective layer (12) on one side and a contact adhesive (16) on the other side covered with a peelable protective sheet (18). The protective sheet (18) is peeled back from one edge and an indicia sheet (24) attached. Then they are fed through a nip between rollers (26, 28), peeling the protective sheet (18) back as it advances. The indicia layer is thus laminated to the panel, the indicia facing the panel and being visible therethrough.



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DISPLAY PANELS

This invention relates to the production of display materials, and is particularly concerned with improved methods of preparing and presenting display material in sheet form.

Sheet display material can be of various types. For example, it may take the form of printed paper or fabric, photographs or transparencies. Many of such sheet materials are unsuitable for direct exposure to the surrounding environment, for example because of the danger of damage, and accordingly it is desirable to protect the sheet material by means of a transparent covering, which could be glass, but more usually is transparent plastics; especially acrylic sheet such as Perspex (Trade Mark). If the display sheet is merely supported behind the covering panel, the covering panel merely has a protective effect, and does not contribute greatly towards the visual effect of the display. However, if the display sheet is laminated to the reverse side of the protecting panel, there is a considerable enhancement of the visual effect. The present invention is directed to a method of effecting such lamination, and to display products produced thereby.

According to one aspect of the present invention there is provided a method of producing a display panel using a substantially rigid transparent panel to one surface of which a contact adhesive has been applied, the surface of

the adhesive remote from the panel being covered by a protective sheet which is peelable therefrom so as to leave the contact adhesive on the panel; the method comprising peeling the protective sheet from the adhesive and applying to the exposed adhesive a flexible sheet carrying the display indicia, so that the display indicia are in contact with the adhesive. There can then optionally be applied to the exposed reverse side of the indicia sheet a protective backing layer. This backing layer may take the form of a sheet of material carrying a contact adhesive on one surface which is brought into contact with the exposed reverse side of the indicia sheet. If the indicia sheet is transparent, the backing sheet may be adapted to provide a specific visual effect when the indicia sheet is viewed through the transparent panel. For example, the backing sheet may be of translucent material so that the finished panel can be mounted in a light box to produce an illuminated sign. Alternatively or additionally the backing can be coloured so as to provide a coloured background to the transparency. Instead of a coloured backing sheet, a coloured backing may be applied by means of paint.

In another aspect the present invention provides a substantially rigid transparent panel having a contact adhesive applied to one face thereof, the surface of the contact adhesive remote from the panel being covered with a protective sheet which is peelable therefrom leaving the adhesive on the panel.

In order that the invention may be more clearly understood, various embodiments will now be described with reference to the accompanying drawings, which show in fragmentary side view four successive stages in the production of a typical display panel.

Referring to the drawings, and firstly to Fig. 1; a substantially rigid transparent acrylic plastics panel 10 is protected on one surface by a layer of plastics film 12 laminated to it by a contact adhesive; the adhesive being selected so that the film 12 can be peeled from the panel 10, taking the adhesive with it, and leaving a clean surface to the panel 10. The opposite surface of the panel 10 is to have a layer of contact adhesive applied to it. This is effected by means of a web 14, of a type which is commercially available, and comprises a double-sided contact adhesive layer 16 laminated on one side to a plastics film 18 and on the other side to a silicon treated paper 20. Both the plastics film 18 and the paper 20 are peelable from the adhesive layer 16, but the silicon treatment of the paper layer causes the paper to be more easily peelable from the adhesive layer. Thus, the paper layer is drawn away from the adhesive layer 16 as the web is passed around a rubber roller 22. This roller co-operates with another roller (not shown) to provide a nip, and the transparent panel 10 is introduced into this nip so that its surface remote from the protective film 12 contacts the adhesive layer 16, thereby causing the adhesive layer 16 and film

layer 18 to be laminated to the transparent panel.

The laminated product resulting from the step shown in Fig. 1 can then be handled, transported and stored until required for use. When that time comes, the next stage shown in Fig. 2 takes place. First of all, the protective film layer 18 is peeled back from one edge of the panel 10, exposing a marginal portion of the adhesive layer 16. A sheet 24 carrying the display indicia is then carefully positioned so that a marginal portion of the sheet 24 overlies the exposed marginal portion of the adhesive 16, and the edge of the sheet is pressed onto the adhesive. Then the panel 10, with the sheet 24 marginally attached, is fed into a nip between a roller 26, preferably of steel but it could be rubber, and a rubber roller 28; these rollers being driven at a suitable speed by an electric motor. The edge at which the sheet 24 is initially adhered to the panel 10 enters the nip first, and as the rollers draw the panel and sheet through the nip the protective film layer 18 is drawn away from the adhesive layer 16, until finally the panel passes completely through the nip and the sheet 24 is fully laminated to the panel 10. The display indicia on the sheet 24 face the panel 10, and are therefore visible through the panel when the protective film 12 is removed. This protective film 12 can be removed at any desired time; even before the laminating process. More likely, however, it will be left in place until the panel is ready for installation at the desired display site, so as to provide maximum protection.

The laminated product resulting from the step of Fig.2 can be used as it is, subject to the removal of the protective film 12. Preferably, however, it goes through a further laminating process as shown in Fig. 3. In this example, a composite sheet 30 comprises a backing layer 32, for example of plastics film, carrying a contact adhesive layer 34, and a protective layer 36 overlies the adhesive layer 34 on the side remote from the backing layer 32, and as with the layer 20 shown in Fig. 1 it is more readily peelable from the adhesive layer 34 than is the backing layer 32. The protective layer 36 is peeled back along one edge, and the exposed edge portion of the adhesive layer 34 is applied to an edge of the reverse surface of the indicia sheet 24. Then the panel 12 is fed through the nip between the rollers 26,28 in the same manner as in Fig.2, the layer 36 being withdrawn from the adhesive layer 34 as the panel advances through the rollers.

The result is a display panel as shown in Fig.4, which comprises a rigid transparent panel 10 (in this case shown with the protective layer 12 removed) to which an indicia sheet 24 is laminated by means of a contact adhesive layer 16 so that the indicia are visible through the panel, the reverse side of the indicia sheet being protected by means of a backing layer 32 laminated thereto by means of a contact adhesive layer 34.

In passing through the rollers 26,28, the steel roller 28 lies adjacent the panel 10 (or its protective layer 12),

while the rubber roller 26 bears upon the sheet or film which is being laminated to the other side of the panel. In this way a lamination substantially free from noticeable air pockets can be produced.

The backing film 24 can conveniently be of polyvinyl chloride or other opaque plastics film. If the indicia 24 is transparent or translucent, the backing sheet will be visible through it, and hence the colour of the backing sheet can be selected so as to produce a desired visual effect. In some cases, however, it may be intended that the transparent indicia sheet should be mounted in a light box so as to produce an illuminated sign. In such a case, the backing sheet, if provided, must obviously be able to transmit that light. For this purpose, it is convenient if the backing sheet is of translucent material so as to transmit light while obscuring details of the interior of the light box, and also serving to diffuse the light more evenly.

In another modification, after the lamination step of Fig.2, if the indicia sheet 24 is of transparent or translucent material a layer of paint can be applied to its reverse surface, for example by spray coating, so that the colour of the paint is visible as a backing to the indicia. The panel thus prepared can be used as it is, but preferably it undergoes a further lamination step as in Fig. 3 so as to provide a protective backing film 32 over the paint layer. The application of paint, especially by spraying, can be

used to give very striking effects, particularly where different colours are applied in different areas.

The present invention includes display panels produced by the foregoing methods, or having an equivalent structure. The present invention has been found to produce panels of remarkably high quality and striking visual appearance in a particularly easy manner which does not require expensive machinery or highly skilled labour. Thus, a user purchasing the laminated sheet resulting from the step shown in Fig. 1 can apply his own indicia using a relatively expensive steel/rubber roller mechanism, and with a little care and practice he should be able to produce near prefect results every time.

CLAIMS

1. A method of producing a display panel using a substantially rigid transparent panel (10) to one surface of which a contact adhesive (16) has been applied, the surface of the adhesive remote from the panel being covered by a protective sheet (18) which is peelable therefrom so as to leave the contact ahdesive on the panel; the method comprising peeling the protective sheet (18) from the adhesive and applying to the exposed adhesive a flexible sheet (24) carrying the display indicia, so that the display indicia are in contact with the adhesive.

2. A method according to claim 1 wherein a protective backing layer (32) is then applied to the exposed reverse side of the indicia sheet (24).

3. A method according to claim 2 wherein the backing layer takes the form of a sheet (32) of material carrying a contact adhesive (34) on one surface which is brought into contact with the exposed reverse side of the indicia sheet (24).

4. A method according to any one of the preceding claims, wherein the protective sheet (18) is peeled back from one edge of the panel exposing a marginal portion of the adhesive (16), the indicia sheet (24) is positioned so that

a marginal portion thereof overlies the exposed marginal portion of the adhesive (16) and the two are then pressed together, then the panel with the indicia sheet thus marginally attached is fed into a nip between a pair of rollers (26,28), the edge at which the indicia sheet is initially adhered to the panel entering the nip first, and as the panel and indicia sheet pass through the nip the protective film layer (18) is drawn away from the adhesive layer (16) until finally the panel passes completely through the nip and the indicia sheet (24) is fully laminated to the panel.

5. A method according to claim 4 wherein the nip is provided by a hard roller (28) and a soft roller (26), the hard roller contacting the panel (10) on the side remote from the indicia sheet.

6. A method according to claim 4 or claim 5 wherein the transparent panel (10) carries on its surface remote from the indicia sheet a protective layer (12) peelably secured thereto by a contact adhesive which peels away with the protective layer leaving a clean face to the transparent panel.

7. A substantially rigid transparent panel (10) having a contact adhesive (16) applied to one face thereof, the surface of the contact adhesive remote from the panel being covered with a protective sheet (18) which is peelable

therefrom leaving the adhesive (16) on the panel (10).

8. A panel according to claim 7 having a protective layer (12) peelably secured to its other face by a contact adhesive which peels away with the protective layer leaving a clean face to the transparent panel.

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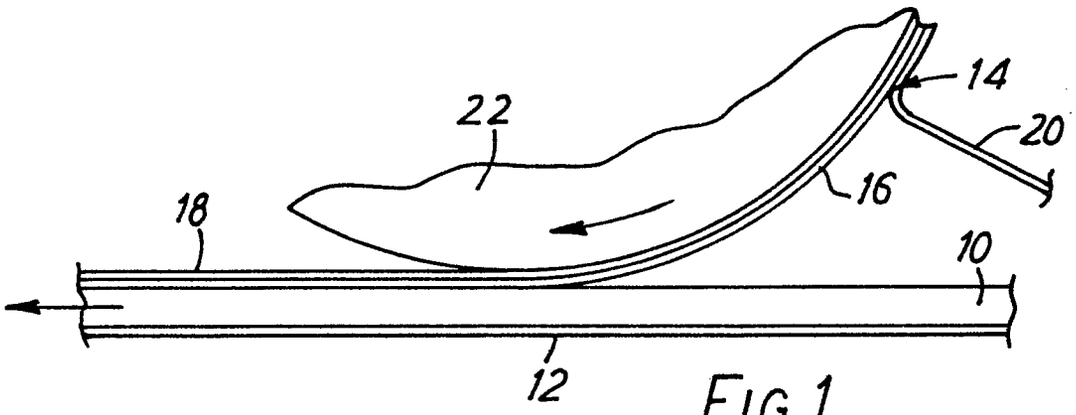

FIG.1

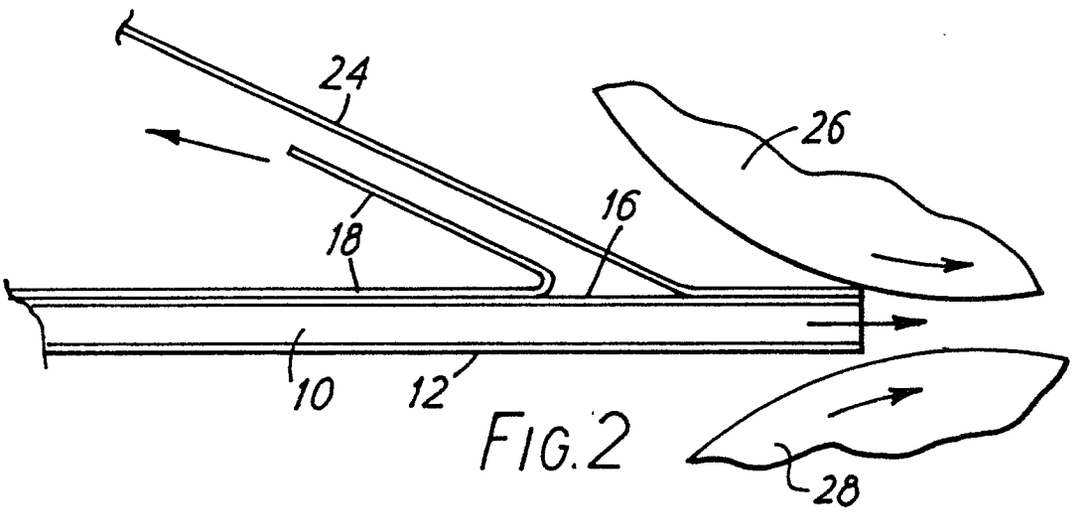

FIG.2

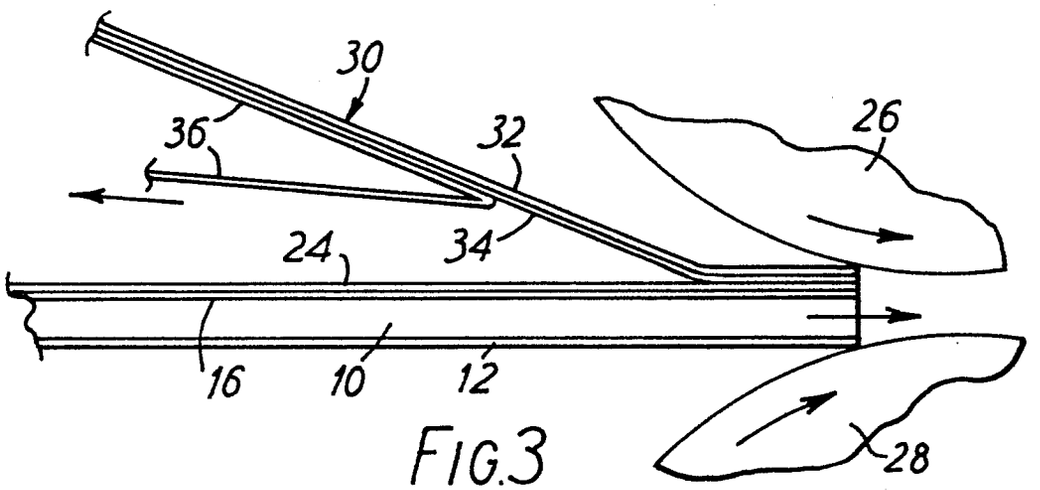

FIG.3

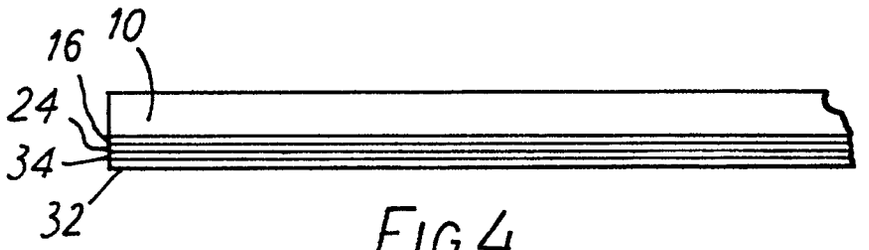

FIG.4