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(56) Documents Cited:
GB 1150796 A **US 4880485 A**
US 3655493 A **US 3460303 A**

(58) Field of Search:
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(54) Abstract Title: **Decorative pane comprising supporting substrate and decorative members attached thereto**

(57) A decorative pane 10 is disclosed comprising two outer panes 11, 11' sandwiching a plastic supporting substrate 12 to which at least one decorative element 13 has been applied. Also disclosed is a decorative pane 10 comprising a plastic supporting substrate 12 to which at least one decorative element 13 has been press-fit.

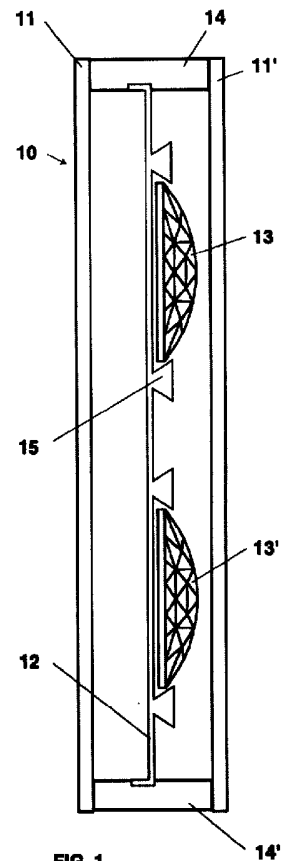
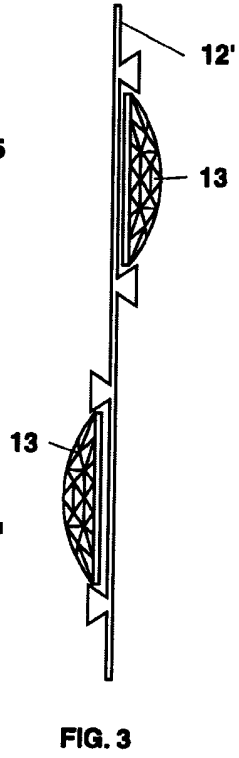
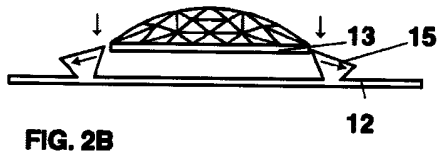
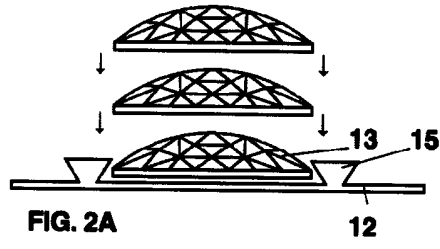
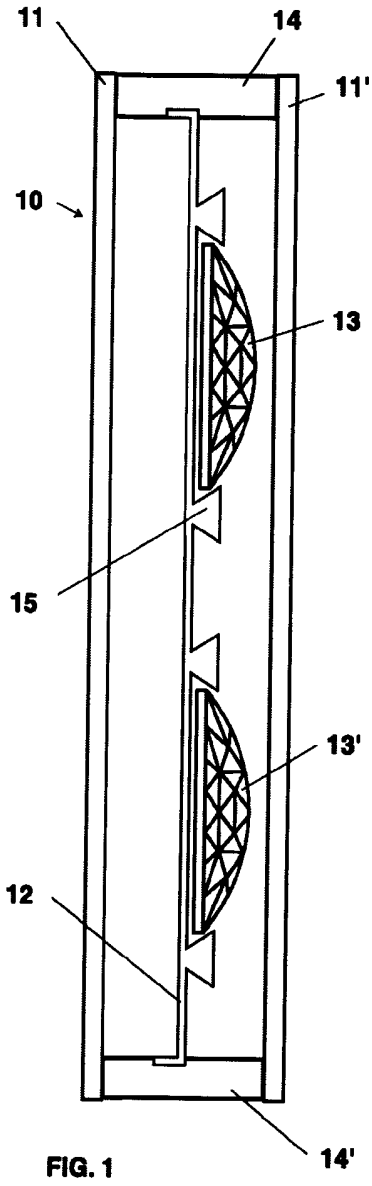


FIG. 1



DESCRIPTION

DECORATIVE PANEField of Invention

This invention relates to a decorative pane.

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Background to Invention

Traditionally, decorative glass panes comprise a mosaic of coloured glass pieces, individually shaped and held together by strips of lead and supported by a rigid frame.

10 More recently, such panes have been created by forming decorative elements on an underlying, supporting glass substrate. This would include the direct bonding of decorative elements to the substrate as well as the bonding of bevels on the substrate and the creation of decorative elements in the cavities defined by the bevels and the supporting substrate (e.g. by curing coloured
15 liquid resin poured in to the cavities). It is also known to bond a decorative, unitary plastic moulding to a supporting glass substrate.

Such decorative panes can be doubled glazed by sandwiching decorative elements applied to one supporting glass substrate with another glass substrate.

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Summary of Invention

In accordance with a first aspect of the present invention, there is provided a decorative pane comprising two outer panes sandwiching a plastic supporting substrate to which at least one decorative element has been
25 applied.

For the avoidance of doubt, "supporting" is intended to mean that the plastic supporting substrate has some degree of structural integrity sufficient to support the decorative elements at least to some extent independently of the outer panes. It is not intended to include, for example, a thin film that would
30 have to be bonded to one of the outer panes to prevent distortion and / or sagging of the film under the weight of the decorative elements. Furthermore, it

is not intended to exclude an arrangement where the outer panes are in contact with the supporting substrate and provide restraint in a direction perpendicular to plane of the panes.

The inventor has realised that such a decorative pane with its plastic supporting substrate has many benefits including: simplified manufacture compared to conventionally manufactured decorative panes; enabling decorative elements to be readily applied to either side of the plastic supporting substrate, facilitating a dual aspect decorative pane, i.e. where decorative elements are provided facing both outer panes; and requiring no adhesives as there is no requirement to bond the supporting substrate to either pane.

In accordance with a second aspect of the present invention, a decorative pane is provided comprising a plastic supporting substrate in to which at least one decorative element has been press-fit, and including the possibility of at least one decorative element being press-fit in to each side of the plastic supporting substrate.

Press-fitting both simplifies manufacture and also accommodates decorative elements manufactured to loose tolerances or with irregular or uneven surfaces, which may previously have been unsuccessfully bonded to glass.

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Brief Description of Drawings

The invention will now be described, by way of example only, with reference to the following figures in which:

Figure 1 shows, schematically, a section through a decorative, double glazed pane in accordance with the present invention;

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Figures 2a and 2b illustrating the press-fitting of a decorative element in to the plastic supporting substrate of the pane of figure 1.

Figure 3 shows, schematically, an alternative configuration of a the plastic supporting substrate and decorative elements according to the present invention.

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Figure 4 shows, schematically, a further alternative configuration of a the plastic supporting substrate according to the present invention.

Detailed Description

Referring to figure 1, a section through a decorative, double glazed pane 10 is shown composed of two outer panes of glass 11, 11' sandwiching an internal moulded plastic substrate 12 with flexible protrusions 15 for retaining decorative elements 13, 13' using a press-fit. The plastic substrate would typically be a UV stable polyester or acrylic.

The panes 11, 11' and the plastic substrate 12 are joined at their respective peripheries by spacers 14, 14' whereby the panes and the plastic substrate are spaced apart.

Figures 2a and 2b illustrate the press-fitting of a decorative element 13 in to the plastic supporting substrate 12. In particular, moulded protrusions 15 are shown deforming when receiving the decorative element.

Figure 3 shows, schematically, an alternative plastic supporting substrate 12' whereby decorative elements 13, 13' are press-fit in to opposing sides of the supporting substrate, thereby facilitating a dual aspect decorative pane (not shown) incorporating the same.

Figure 4 shows, schematically, a feature of an alternative plastic supporting substrate 12'' according to the present invention with a decorative element in the form of a concave recess. It would be inherently difficult to provide such a feature in a conventional film for bonding to a pane, however, with the structural integrity associated with plastic supporting substrates of the present invention, such a decorative element can be readily sandwiched between outer panes.

The supporting plastic substrate can be manufactured by conventional techniques including vacuum forming. One would expect a suitable thickness of plastic to be in the order of 2 to 4mm so as to have sufficient rigidity to support decorative elements, but also sufficient flexibility to enable decorative elements to be press-fit in to place.

A preferred method of manufacturing is as follows. Step 1: to machine a mould for the supporting substrate from say an acrylic, i.e. a material generally unsuited to heat applied during vacuum forming but one which may be readily

machined. Step 2: to form a negative mould (i.e. corresponding to the shape of the supporting substrate) using rubber. And step 3: to form a positive mould from a specialist casting compound, e.g. to create a silastic mould. This enables fine textures and detail to be rendered because of the workability of acrylic compared to say aluminium which might conventionally be used to make a first mould of a product for which manufacture by vacuum forming is intended.

Alternatively, one might initially make a silastic mould and final tool from an original glass master. This is significant as it allows the replication of an existing glass styles. In particular, fused, kiln formed and slumped decorative glass could be replicated with great accuracy.

The decorative elements can be made from a range of materials that are currently not commonly used as decorative elements for such panes including plastic, onyx or marble. Colour can be added by floating liquid plastic dyes into cavities created during moulding of the plastic substrate. The plastic substrate may also have embossed textures formed as part of the moulding process where, for example, some obscuration of a pane is required.

The rigidity of the supporting substrate may be enhanced with deep grooves which may also have an aesthetic quality.

The present invention may be particularly useful for decorative mirrors as the supporting substrate need not be bonded to a mirrored surface .

From reading the present disclosure, other modifications will be apparent to persons skilled in the art. Such modifications may involve other features which are already known in the design and manufacture of plastic mouldings and decorative panes, and component parts thereof and which may be used instead of or in addition to features already described herein

CLAIMS

1. A decorative pane comprising two outer panes sandwiching an plastic supporting substrate to which at least one decorative element has been applied.
2. A decorative pane as claimed in claim 1 wherein at least one decorative element has been applied to each side of the plastic supporting substrate.
3. A decorative pane as claimed in any of the preceding claims further comprising a spacer for joining the outer panes and the plastic supporting substrate at their respective peripheries.
4. A decorative pane as claimed in any of the preceding claims wherein at least one decorative element has been press-fit in to the plastic supporting substrate.
5. A decorative pane as claimed in claim 4 wherein at least one decorative element has been press-fit in to each side of the plastic supporting substrate.
6. A decorative pane comprising a plastic supporting substrate to which at least one decorative element has been press-fit.

Amendments to the claims have been filed as follows

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CLAIMS

1. A decorative pane comprising two outer panes sandwiching an plastic supporting substrate to which at least one decorative element has been applied.
2. A decorative pane as claimed in claim 1 wherein at least one decorative element has been applied to each side of the plastic supporting substrate.
3. A decorative pane as claimed in any of the preceding claims further comprising a spacer for joining the outer panes and the plastic supporting substrate at their respective peripheries.
4. A decorative pane as claimed in any of the preceding claims wherein at least one decorative element has been press-fit in to the plastic supporting substrate.
5. A decorative pane as claimed in claim 4 wherein the plastic supporting substrate is a planar substrate from which moulded protrusions protrude, and in to which at least one decorative element has been press-fit.
6. A decorative pane as claimed in claim 4 wherein at least one decorative element has been press-fit in to each side of the plastic supporting substrate.
7. A decorative pane comprising a planar, plastic supporting substrate from which moulded protrusions protrude, and in to which at least one decorative element has been press-fit.

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Examiner: Mr Alastair Kelly

Claims searched: 1-6

Date of search: 8 February 2008

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X,Y	X: 1-3; Y: 4, 5	US3460303 A (ALGRAIN) See figures and note column 2, lines 20-37
X,Y	X: 6, Y 1-5	US3655493 A (CAMPBELL) See abstract and figures
X,Y	X: 6; Y 1-5	US 4880485 A (LEWIS) See abstract and figures
Y	1-5	GB 1150796 A (SCHUMM) See figures and note page 1, lines 18-43

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^X:

E1R

Worldwide search of patent documents classified in the following areas of the IPC

B44C; B44F; E06B

The following online and other databases have been used in the preparation of this search report

EPODOC, WPI

International Classification:

Subclass	Subgroup	Valid From
B44F	0001/06	01/01/2006
E06B	0003/66	01/01/2006