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(12) # EUROPEAN PATENT SPECIFICATION

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(54) **Plastic cupolas, or domes for chandeliers and other illumination means.**

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Description

This invention refers to plastic cupolas, or domes for chandeliers and other illumination means and to the procedure for their production.

As is known, in table, ceiling, arm type and similar lighting fittings, or equivalent illumination means, the dome, or cupola encloses, or at least protects the source, or the sources of light, generally one, or more electric incandescent, or gas discharge bulbs.

The production of lighting fittings where the cupolas or domes are of plastic, such as polymetacrylate is known to the sectorial art. Such known cupolas, or domes are only made of two layers, where the internal layer is transparent, while the external layer is coloured.

The selective mechanical removal of at least part of the coloured layer exclusively allows a chromatic effect to be obtained resulting from the transparency of the internal layer. This effect is due to the resulting optics of only the two overlying layers, only one of which is transparent as mentioned. The procedure for the production of such domes, or cupolas includes: the formation of multiple sheet material, made up of two layers, as specified above; the selective, mechanical removal of a part of the coloured layer: the heat-forming of the double sheet, generally by heating and around suitable moulds, to obtain the desired three-dimensional shape and the polishing of the dome, or cupola obtained. Thus, a suitable dome, or cupola is obtained as a lighting means having one, or more stripes, or equivalent markings which give the lighting fixture a chromatic "pattern" defined exclusively by a single colour. DE—A—2505183 discloses a plastic dome for lamps and other lighting means made up of stratified material and having a chromatic effect, wherein the stratified material consists of at least three adjacent layers of which at least one is transparent and at least two are coloured with differentiated colours and the chromatic effect is obtained by partial, selective and differentiated superposition of a part of the coloured layers.

The object of this invention is to provide cupolas, or domes suitable as lighting means, having numerous patterns with different colourings and chromatic effects and combined and integrated in various ways. According to the present invention, this object is achieved by using a multiple stratified sheet material exclusively consisting of translucent layers of which at least one is transparent and at least two are coloured with differentiated colours and the patterns are obtained by partial, selective and differentiated removal of at least a part of at least one of the coloured but translucent layers, the chromatic effect being obtained by the combination of the colours in contrast with the colours resulting from those parts where partial or complete areas are removed.

The cupola, or dome of the present invention is characterised by being made up at least three adjacent translucent layers of polymeric material, such as polymetacrylate, of which at least one is transparent and at least two are coloured with differentiated colours and having a pattern of variously shaped geometry obtained by the partial and differentiated removal of a part of at least one of the coloured but translucent layers. In particular, the product obtained according to this invention is characterised by being made up of a stratified layer, preferably of metacrylate, including at least three adjacent translucent layers, of which at least one is transparent and at least two are coloured, made to adhere to one another using known systems and/or means, such as adhesives, heat treatments and so forth. The said sheet may be formed, using known systems, such as by heat and on coherent moulds and/or counter-moulds to realise a "cupola", or "dome" of three-dimensional geometry, corresponding to the various architectonic and environmental requirements and conveniences. The coloured layers are produced using coloured materials according to known techniques, in the plastic mass, or by surface application of colourants, an application that may be preceded by mordanting, or other known treatment that guarantees the stability of the colouring.

These layers have different thicknesses, and the said thickness is greatest in correspondence to the innermost layer of the hollow body, which materialises the said cupola, or dome, a layer which is preferably transparent. All the coloured layers, except for the innermost layer of Figure 1;

Figure 3 represents the schematic front view of the multiple sheet of Figure 1 with a pattern simplified by concentric rings obtained by the selective removal of part of the overlying layers;

Figure 4 represents the schematic side view of Figure 3 and Figure 5 represents the perspective view and part section of a cupola, or dome obtained using the multiple sheet of Figure 3.

With special reference to the Figures, the starting sheet material is a multiple sheet (10) of polymeric material as for example polymetacrylate, produced by stratification.

This said multiple sheet 10, exclusively consisting of translucent layers, includes a transparent sheet 12 associated with several sheets 14, 16 and 18 each one of which is coloured differently from the others. The transparent sheet 12, which in practice is destined to become the load bearing structure of the final product, has a thickness that is significantly greater than that of the other sheets 14, 16 and 18. The other said sheets 14, 16 and 18 are processed mechanically so as to selectively remove portions of them according to a predetermined pattern which for the sake of simplicity is illustrated with concentric circles in the Figures.

Hence, this pattern could have a different geometry, straight line, curved line, or otherwise for example with dashed lines, are processed at least by partial removal, preferably using a mechanical process.

Hence in the multiple structure resulting from the combination of the various layers it is possible

to observe the colour, or the colours of the other adjacent layer, or layers through the innermost layer, which, as already mentioned, is completely transparent, as well as the chromatic effect resulting from their combination.

The chromatic effect is further integrated by the pattern and/or by the geometry of the outlines of at least part of the adjacent layers.

The structure in itself is prevailently formed by the layer of transparent material, which constitutes the main load bearing and stress resistant element.

The dome, or cupola obtained according to this invention may be associated with load bearing parts, such as a rod, an arm, one, or more small columns or other means.

The characteristics of the procedure according to the invention and of the relative products may be understood better from the following detailed description, where reference is made to the drawings which represent an embodiment example and where:

Figure 1 represents the schematic, front view of a multiple, four layer sheet with different colourings;

Figure 2 represents the schematic side view of the sheet or another mixtilinear pattern.

The above mentioned sheet 10, illustrated in the Figure with four layers may be used for the production of a dome, or cupola indicated overall by 20 in Figure 5.

By removal of annular areas 22, 24 and 26 from the respective coloured sheets 18, 16, 14 a product 20 is obtained having a pattern of virtually coaxial rings. In fact, the said removal operations characteristically reveal the colours and chromatic shades due to the different mass and/or surface colourings of the adjacent sheets 14, 16 and 18.

Naturally, patterns of a different geometry can be obtained by varying the parts removed from each coloured sheet, as well as the number of overlaid coloured sheets.

The product 20 may be obtained by any known technique as, for example, by heat and on coherent moulds and/or countermoulds. The three dimensional shape of the product 20 obviously may be different from the example, depending on the various architectonic and environmental requirements and conveniences.

The product 20 may be supported by any known means, such as for example, a central rod, an arm, or a crown of small load bearing columns or another arrangement. The selective removal of the material, necessary to obtain the desired architectonic pattern made be made using any known means, for example mechanically.

Changes, modifications and variations may be made in the practical realisation of this invention without leaving its protective sphere.

Claims

1. Plastic cupolas, or domes (20) for chandeliers and other lighting means made up of stratified material (10) and having a chromatic effect, wherein said stratified material consists of at least three adjacent layers (12, 14, 16, 18) of which at least one (12) is transparent and at least two (14, 16, 18) are coloured with differentiated colours and the chromatic effect is obtained by partial, selective and differentiated superposition of a part of the coloured layers, characterized in that the stratified material exclusively consists of translucent layers of which at least one (12) is transparent and at least two (14, 16, 18) are coloured with differentiated colours and the patterns are obtained by partial, selective and differentiated removal of at least a part (22, 24, 26) of at least one of the coloured, but translucent, layers (14, 16, 18); the chromatic effect being obtained by the combination of the colours in contrast with the colours resulting from those parts where partial or complete areas are removed.

2. Cupolas or domes according to claim 1, wherein the adjacent layers are four, one of which is transparent and the other three are translucently coloured with different colours.

3. Cupolas or domes according to claim 1 or 2, wherein the removed parts are annular areas and the resulting patterns are coaxial rings.

Patentansprüche

1. Kunststofflaternen oder Kuppeln (20) für Leuchter und andere Beleuchtungsvorrichtungen aus einem geschichteten Material (10) und mit einem Farbeneffekt, wobei das obengenannte geschichtete Material aus mindestens drei angrenzenden Schichten (12, 14, 16, 18) besteht, von denen wenigstens eine (12) transparent ist und wenigstens zwei (14, 16, 18) in verschiedenen Farben gefärbt sind, und der Farbeneffekt wird durch teilweise, selektive und unterschiedliche Überlagerung eines Teils der gefärbten Schichten erzielt, gekennzeichnet dadurch, daß das geschichtete Material ausschließlich aus durchschneinenden Schichten besteht, von denen wenigstens eine (12) transparent ist und mindestens zwei (14, 16, 18) in verschiedenen Farben gefärbt sind, und die Muster werden durch teilweise, selektive und unterschiedliche Entfernung von wenigstens einem Teil (22, 24, 26) von mindestens einer der gefärbten, jedoch durchscheinenden Schichten (14, 16, 18) erreicht; der Farbeneffekt wird durch die Kombination der Farben im Kontrast zu den Farben erzielt, die sich von den Teilen ergeben, wo Teilflächen oder ganze Flächen entfernt werden.

2. Laternen oder Kuppeln gemäß Patentanspruch 1, wobei die angrenzenden Flächen vier sind, eine von ihnen ist transparent und die anderen drei sind in verschiedenen Farben durchscheinend gefärbt.

3. Laternen oder Kuppeln gemäß Patentanspruch 1 oder 2, wobei die entfernten Teile ringförmige Flächen und die sich ergebenden Muster koaxiale Ringe sind.

Revendications

1. Coupoles ou dômes (20) en plastique pour lampadaires et autres moyens d'éclairage faits de matières stratifiées (10) et ayant un effet chromatique, où ladite matière stratifiée consiste d'au moins trois couches adjacentes (12, 14, 16, 18) desquelles au moins une (12) est transparente et au moins deux (14, 16, 18) sont colorées avec des couleurs différenciées et l'effet chromatique est obtenu par la superposition différenciée, partielle et sélective d'une partie des couches colorées, caractérisée par le fait que la matière stratifiée consiste exclusivement de couches translucides dont au moins une (12) est transparente et au moins deux (14, 16, 18) sont colorées avec des couleurs différenciées et les modèles sont obtenus par l'enlèvement différencié, sélectif et partiel d'au moins une partie (22, 24, 26) d'au moins une des couches (14, 16, 18) colorées, mais translucides; l'effet chromatique étant obtenu par la combinaison des couleurs en contraste avec les couleurs résultant de ces parties où des zones complètes ou partielles sont enlevées.

2. Des coupoles ou des dômes d'après la revendication 1, où les couches adjacentes sont quatre, dont une est transparente et les autres trois sont colorées de manière translucide avec des différentes couleurs.

3. Des coupoles ou des dômes d'après les revendications 1 ou 2, où les parties enlevées sont des zones annulaires et les modèles qui résultent sont des anneaux coaxiaux.

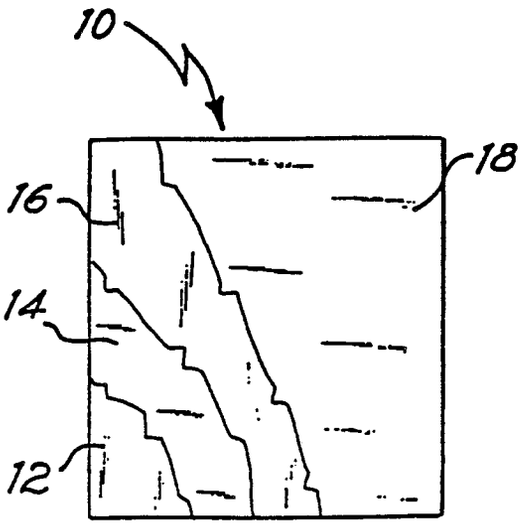


Fig. 1

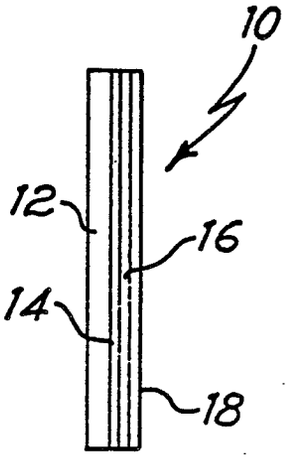


Fig. 2

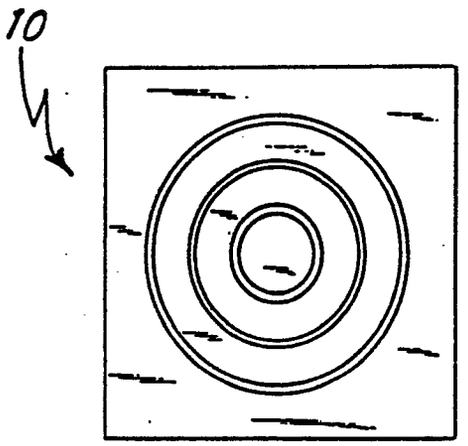


Fig. 3

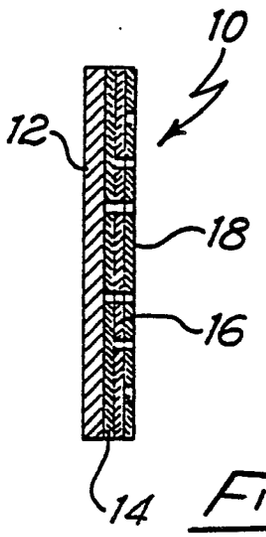


Fig. 4

Fig. 5

