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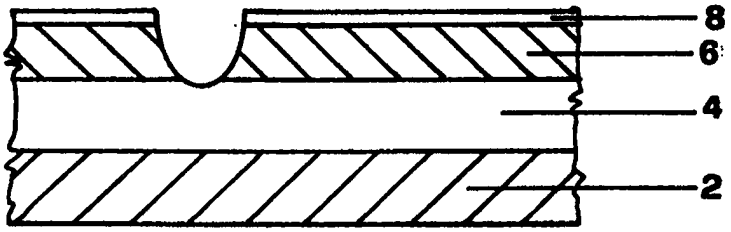
(54) Title: COMPOSITE LAMINATE, METHOD FOR DECORATING PANELS WITH THE LAMINATE, AND PANEL OBTAINED BY THE METHOD

(57) Abstract

A composite thermoplastic continuous laminate, particularly for cladding flat or shaped panels of wooden material, characterised by comprising a through–coloured lower layer (2), an intermediate layer (4) of transparent material, and a through colored upper layer (6, 10) of different colour and/or characteristics from those of the lower layer.



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COMPOSITE LAMINATE, METHOD FOR DECORATING PANELS WITH THE LAMINATE, AND PANEL OBTAINED BY THE METHOD

The invention relates to a composite laminate, a method for decorating panels with the laminate, and a panel obtained by the method.

Panel decorating methods are known comprising a preliminary stage of pantograph-machining the surface of an MDF substrate to obtain shapes therein corresponding to a predetermined pattern, and a stage in which a thermoplastic laminate cladding sometimes having the colour and graining of wood is applied. The panel prepared in this manner is heated to obtain partial softening of the cladding sheet, which by suitable working adheres to the thus modified surface of the panel.

Other methods have also been proposed using a composite material formed from two different-colour layers of through-coloured thermoplastic material. After being applied to the MDF panel, these are again pantograph-machined to remove the upper layer and reveal the lower layer, which in this manner creates the desired ornamental motif.

An object of the invention is to provide an improved composite laminate which by suitable treatment provides a pleasant outer appearance to the panel to which it is applied.

A further object of the invention is to provide a composite laminate which may be applied to panels obtained with traditional pantograph machines.

These and further objects which will be apparent from the ensuing description are attained according to the invention by a therrmoplastic continuous composite laminate, particularly for cladding panels of wooden material, as described in claim 1.

A method for decoratting a panel covered with the composite laminate is claimed in claim 13.

A panel is obtained as claimed in claim 17.

Some preferred embodiments of the invention are described in detail hereinafter by way of non-limiting example with reference to the accompanying drawings, on which:

Figure 1 is a cross-section through a composite laminate usable in the method of the invention,

Figure 2 shows a modification thereof,

Figure 3 shows a further modification thereof, and

Figure 4 shows a further modification thereof.

As can be seen from the figures, the decoration method of the invention uses a composite continuous laminate formed from:

- a lower layer 2 forming a base support and constructed of through-coloured thermoplastic material, such as PVC or polypropylene,
- an intermediate layer 4 of transparent material, also constructed of thermoplastic material, and
- an upper layer 6 of through-coloured material of different colour and/or characteristics from the constituent material of the lower layer. Preferably also this layer consists of PVC or polypropylene.

A layer of primer is applied to the outer surface of the lower layer 2 to facilitate the bonding of the composite laminate to the panel on application.

A layer of transparent material 8, in varnish or sheet form or both, is applied to the outer surface of the upper layer 6. The purpose of the varnish is to provide the product with resistance to scratching and to chemical agents,

whereas the purpose of the sheet, in the case of printed products, is to protect the print from abrasion in accordance with DIN 6861.

The thickness of the said layers varies from 0.001 mm to 1 mm.

According to the method of the invention, before or after applying the composite laminate, preferably by glueing and pressing, to a MDF panel which may be flat or shaped, the composite laminate is subjected to localized removal of the upper layer 6 until the transparent layer 4 is reached, so that the person viewing the panel sees cladding having the appearance of the upper layer 6 and, in the regions in which said layer 6 has been removed, the lower layer 2.

The localized removal can be effected by chemical treatment (solvent) or by mechanical machining (scraper or pantograph).

In the embodiment shown in Figure 2 the lower layer or base support 2 has that surface in contact with the intermediate layer 4 printed to display colours and graining reproducing a particular type of wood, the upper layer 6 again being a through-coloured layer of thermoplastic material. In this case, following the localized removal, a panel is seen clad with plastic material which in the removed regions displays the underlying wood-type surface.

In the embodiment shown in Figure 3 the transparent layer 4 has both its surfaces printed in the form of two different types of wood, the upper of these surfaces being covered with a layer of transparent thermoplastic material 8, which is subsequently varnished.

In this case the localized material removal gives the effect of a panel formed from two different types of wood, which overall give the effect on inlaid wood, but produced by an industrial method.

In the embodiment shown in Figure 4, the inner surface of the lower layer or base support 2 is printed, whereas to the upper surface of the transparent layer 4 there is applied a layer of coloured pigmented varnish 10. In this manner, following localized removal, the effect is obtained of an overpainted wooden panel.

CLAIMS

1. A composite thermoplastic continuous laminate, particularly for cladding flat or shaped panels of wooden material, characterised by comprising a through-coloured lower layer (2), an intermediate layer (4) of transparent material, and a through colored upper layer (6,10) of different colour and/or characteristics from those of the lower layer.

2. A composite laminate as claimed in claim 1, characterised in that a layer of primer is applied to the outer surface of the lower layer (2) to facilitate its bonding to the panel.

3. A composite laminate as claimed in claim 1, characterised in that the lower layer (2) and/or the upper layer (6,10) consist preferably of PVC, polypropylene, etc.

4. A composite laminate as claimed in claim 1, characterised in that the transparent layer (4) is constructed of thermoplastic material.

5. A composite laminate as claimed in claim 1, characterised in that the lower layer (2) consists of a sheet of thermo-deformable material having its surface printed to display colours and graining which reproduce a particular type of wood.

6. A composite laminate as claimed in claim 1, characterised in that at least one of the surface of the intermediate layer (4) is printed.

7. A composite laminate as claimed in claim 1, characterised in that a transparent protection layer (8) is applied to the intermediate layer (4) of thermodeformable material.

8. A composite laminate as claimed in claim 7, characterised in that said protection layer (8) is a transparent varnish.

9. A composite laminate as claimed in claim 7, characterised in that said protection layer is a sheet of thermoplastic material.

10. A composite laminate as claimed in claim 7, characterised in that said protection layer (8) is a combination of a sheet of thermoplastic material and a layer of transparent varnish.

11. A composite laminate as claimed in claim 1, characterised in that both surfaces of the intermediate layer (4) are printed in accordance with colours and characteristics of different types of wood.

12. A composite laminate as claimed in claim 1, characterised in that the upper layer is a coloured pigmented varnish (10).

13. A method for decorating flat or shaped panels of wooden material with the thermoplastic composite laminate claimed in one or more of claims 1 to 12, characterised in that after or before said composite laminate has been applied to a panel to be decorated, localized removal of its constituent layers is carried out until the transparent intermediate layer (4) is reached.

14. A decorating method as claimed in claim 13, characterised in that said removal is effected by chemical treatment.

15. A decorating method as claimed in claim 13, characterised in that said removal is effected by mechanical machining.

16. A flat or shaped panel characterised by consisting of a wooden substrate covered with a composite laminate claimed in one or more of claims 1 to 12, and obtained by the method claimed in one or more of claims 13 to 15.

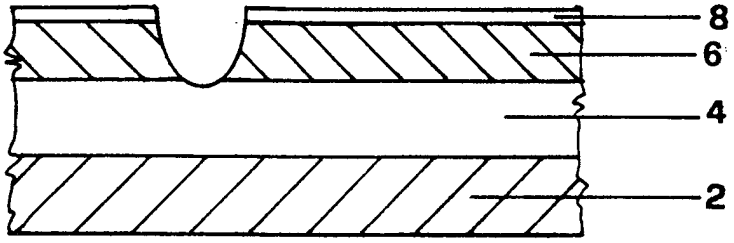

FIG.1

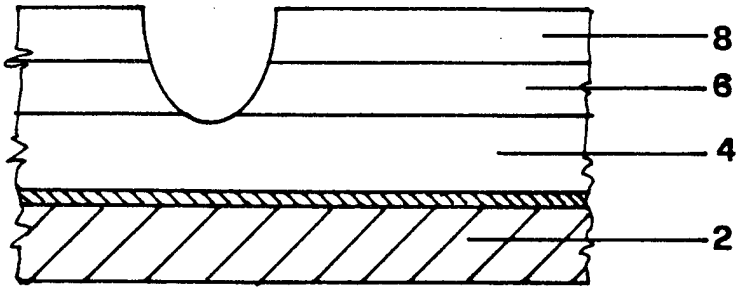

FIG.2

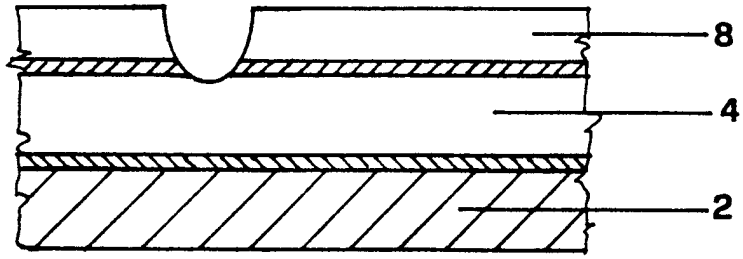

FIG.3

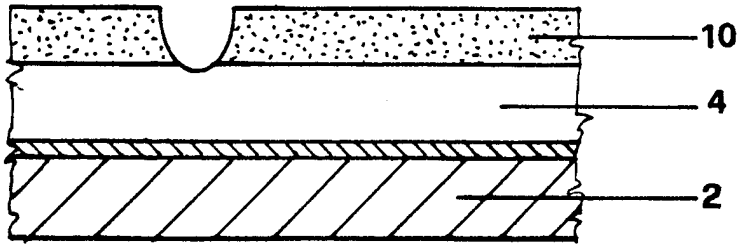

FIG.4

INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 B44C1/22 B44C5/04 B44F9/02 B32B27/30

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 B44C B32B B44F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2 034 251 A (J. R. HARRISON) 4 June 1980 see page 1, line 38 - page 2, line 104	1,3,4,6, 12,13, 15,16
X	EP 0 019 221 A (ALKOR-WERK KARL LISSMANN GMBH & CO KG) 26 November 1980 see page 3, line 25 - page 7, line 15; examples 1-4	1,4-6
X	US 5 275 862 A (F. M. RAMADAN ET AL) 4 January 1994 see column 1, line 54 - column 3, line 34	1,4,5
A	GB 2 291 007 A (DAI NIPPON CO LTD) 17 January 1996 see page 5, line 1 - page 13, line 18	1,3-10

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
A	US 3 874 966 A (L. M. GARCIA) 1 April 1975 see column 1, line 40 - column 6, line 18	1,4,6,7, 9
A	DE 40 32 139 A (ALKOR GMBH KUNSTSTOFFE) 16 April 1992 see column 1, line 41 - column 6, line 20	1-4,7,9

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Information on patent family members

Inte. .onal Application No
PCT/EP 98/02018

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2034251 A	04-06-1980	HK 60584 A	10-08-1984
EP 19221 A	26-11-1980	DE 2919847 B	16-10-1980
		JP 56000184 A	06-01-1981
US 5275862 A	04-01-1994	NONE	
GB 2291007 A	17-01-1996	JP 8001895 A	09-01-1996
US 3874966 A	01-04-1975	NONE	
DE 4032139 A	16-04-1992	NONE	