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(54) **METHOD FOR PRODUCING SCENTED DECORATIVE LAMINATES AND SCENTED FACED PANELS**

(57) A method for producing scented decorative laminates and faced panels, the method comprising:
- using a scented essence to impregnate a sheet of transparent paper without a thermosetting resin;
- layering a sheet of decorative paper impregnated with a thermosetting resin over a substrate and a sheet of transparent paper impregnated with a scented essence over the sheet of decorative paper;
- applying pressure and heat to the layering thus obtained to cross-link the thermosetting resin and stably and rigidly bonding the substrate, the sheet of decorative paper and the sheet of transparent paper together.

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Description

[0001] The present invention refers to a method for producing decorative laminates and faced panels which are scented, i.e. capable of emanating a desired scent for a sufficiently prolonged time.

[0002] "Decorative laminate" generally means a coating material (rigid or flexible) composed of several layers of paper, impregnated with thermosetting resins, typically phenol or melamine resins, bonding the layers together. The cross-linking of the resins is typically achieved by applying pressure and heat to the impregnated sheets of paper. The decorative laminate typically comprises a layer of printed or single-tone decorative paper impregnated with melamine resins and a structuring layer, which can be composed of one or more sheets of Kraft paper impregnated with phenolic resin, or by one or more sheets of paper impregnated with melamine resins or urea-acrylic resins, or a sheet of cellulose sulphur paper, not impregnated with resin, called 'parchment' paper. To increase the abrasion resistance of the laminate, for example in the case of horizontal applications for worktops, an additional layer known in the jargon as 'overlay', which is a high-transparency paper impregnated with melamine resins, may be added. Typically, the decorative laminate is used for coating surfaces on which it is glued.

[0003] "Faced panel" means a panel made of chipboard, plywood, OSB, MDF, HDF or the like, or of wood derivatives or substitutes, coated on at least one side with at least a sheet of paper impregnated with thermosetting resin.

[0004] The development of increasingly realistic papers, combined with the remarkable hardness, scratch resistance and solvent resistance properties of the surface, make these products very much used in the furniture industry.

[0005] There are known techniques of realization of scented synthetic surfaces, generally produced through the insertion or incorporation of the desired essence in the polymeric matrix or in the finishing paint.

[0006] According to the Applicant, the perfuming of said resin-impregnated surfaces of the decorative laminates and of the faced panels can be achieved by adding appropriate essences in the liquid phase of impregnation resins. In this case, the decorative sheets of paper are impregnated with a hardening resin containing an added essence, put into drying ovens and are then ready for subsequent use in a facing press. The Applicant has realized that the above techniques have the following important disadvantages.

[0007] Each decorative pattern-essence combination requires a specific impregnation machine with huge minimum batches.

[0008] The paper impregnated with resin and scented essence has a limited duration because of the duration of the catalysed melamine resin, estimated at about six months, after which the impregnated material is no longer usable.

[0009] The management of different decorative pattern-essence combinations requires large amounts of warehouse stocks with high risk of exceeding the expiry date of the product.

[0010] The Applicant has therefore tackled the problem of obviating the above drawbacks and has come, as a solution, to the present invention in its various embodiments as defined in the following and in the appended claims.

[0011] In one aspect, the present invention refers to a method for producing scented decorative laminates and faced panels, the method comprising:

- using a scented essence to impregnate a sheet of transparent paper without a thermosetting resin;
- layering a sheet of decorative paper impregnated with a thermosetting resin over a substrate and said sheet of transparent paper impregnated with a scented essence over said sheet of decorative paper;
- applying pressure and heat to the layering thus obtained for the purpose of cross-linking said thermosetting resin and stably and rigidly bonding said substrate, said sheet of decorative paper and said sheet of transparent paper together.

[0012] 'Sheet of transparent paper' means a thin (for example, at most a few tenths of a mm thick) film of material suitable for impregnation or coating with scented essences and transparent, or that becomes transparent when it undergoes the cross-linking process of the present invention (so as to see through it the decorative effect of the decorative sheet below), typically a sheet of cellulose paper with no ash content (known in the jargon as 'rough overlay'), but also alternatively suitable materials such as electro-spuns, etc.

[0013] 'Sheet of decorative paper' means a sheet of material (usually paper) suitable for impregnation with thermosetting resins, either single-tone or bearing a decorative print.

[0014] It is understood that in general each reference to a sheet of paper or other material covers the case of more overlaid sheets.

[0015] It is also understood that, in the aforesaid layering, the decorative paper is interposed between the substrate and the sheet of transparent paper.

[0016] According to the Applicant, the use of a sheet of transparent paper not impregnated with resin, but only with essence, together with the usual sheet of decorative paper impregnated with resin, greatly increases the flexibility of the production technique in terms of essence-decorative pattern combinations, reducing warehouse stocks and waste due to product expiration. In fact, the sheet of paper with the desired essence can be easily produced in small batches, has virtually no expiry and can be combined at a later stage will with any decorative paper.

[0017] The present invention may have one or more of the following preferred embodiments.

[0018] The substrate can be a panel made of chipboard, plywood, OSB, MDF, HDF or the like or wood derivatives or substitutes, in the case of production of a faced panel, or one or more sheets of Kraft paper impregnated with phenolic resin or one or more sheets of paper impregnated with melamine resins or urea-acrylic resins, or a sheet of parchment paper (as defined above), in the case of production of a decorative laminate.

[0019] Preferably, the sheet of transparent paper is a high-transparency paper film, such as a rough paper film with no ash content, preferably an alpha-cellulose film.

[0020] Preferably, the sheet of transparent paper has a weight comprised between 15 and 40 g/m^2, more preferably between 20 and 30 g/m^2. Preferably, impregnation of the sheet of transparent paper comprises impregnating or coating the sheet of transparent paper with a solution (e.g. water or alcohol-based) of said scented essence and drying said solution. Preferably, after drying the solution, the sheet of transparent paper is wrapped in a film of plastic material adapted to preserve the essence. Thus, the sheet of transparent paper has a very long duration.

[0021] Preferably, between the step of impregnating the sheet of transparent paper with the scented essence and the aforementioned step of layering, a step of storing the sheet of transparent paper is provided.

[0022] Preferably, after drying, the amount of essence on the sheet of transparent paper is greater than or equal to 5 g/m^2, more preferably greater than or equal to 10 g/m^2, and/or less than or equal to 30 g/m^2, more preferably less than or equal to 25 g/m^2 of dry essence.

[0023] Preferably, the formulation of the dry essence is persistent so as to limit the evaporation of the essence during and immediately after the pressing step.

[0024] Preferably, the step of providing pressure and heat to the so obtained layering is achieved through a single or multi-compartment facing press, for instance a static press, or through a continuous press (for details see, for example, EP 2189298 A1).

[0025] Preferably, pressure is greater than or equal to 30 Kg/cm^2, more preferably greater than 50 Kg/cm^2, since high pressures allow to maintain a high transparency of the sheet of transparent paper thanks to a perfect saturation with the thermosetting resin of the decorative paper below.

[0026] In the case of production of a faced panel, one or more phenolic barriers may be interposed between the substrate and said sheet of decorative paper.

[0027] Preferably, in the case of production of a faced panel, a static press with a hot-hot cycle is used, wherein the temperature is comprised between 160 °C and 200 °C, and/or the duration of the cycle is comprised between 15 s and 60 s, and/or the pressure is comprised between 20 kg/cm^2 and 80 kg/cm^2.

[0028] In the case of production of a decorative laminate, in an embodiment, a static press (typically multi-compartment) with a hot-hot cycle is used, wherein the temperature is comprised between 70°C and 150°C, and/or the duration of the cycle is comprised between 30 min and 70 min, and/or the pressure is comprised between 70 kg/cm^2 and 100 kg/cm^2.

[0029] Always in the case of production of a decorative laminate, in a further embodiment, a continuous press with a hot-hot cycle is used, wherein the temperature is comprised between 160 °C and 200 °C, and/or the speed is comprised between 2 s and 20 m/min, and/or the pressure is comprised between 40 kg/cm^2 and 100 kg/cm^2.

[0030] These and other purposes and advantages will become more apparent with the following detailed description of some examples of embodiment of the invention.

Example 1

Faced panel

[0031] Sheet of transparent paper weighing 25 g/m^2, impregnated with about 10 g/m^2 of dry essence and without resin, overlaid on a sheet of decorative paper impregnated with standard melamine resin for a hot-hot cycle, with or without a phenol or melamine substrate (as known in the art), the whole pressed on a particle or MDF board.

[0032] Hot-hot pressing cycle (i.e. with press plates at a constant temperature) with a single-compartment static press, temperature between 160 and 200°C, cycle duration between 15 s and 60 s and pressure comprised between 20 and 80 kg/cm^2.

Example 2

Decorative HPL (High Pressure Laminate)

[0033] Sheet of transparent paper weighing 25 g/m^2, impregnated with about 10 g/m^2 of dry essence and without resin, overlaid on a sheet of decorative paper impregnated with standard melamine resin for a hot-cold cycle, the whole overlaid on several layers of Kraft paper impregnated with phenol resin (overall thickness between 0,5 mm and 20 mm).

[0034] Hot-cold pressing cycle in a multi-compartment static press for highpressure laminates, having a 70°C-150°C-70°C temperature profile, cycle duration between 30 and 70 min and pressure between 70 and 100 kg/cm^2.

Example 3

Decorative CPL (Continuous Pressure Laminate) or CHPL (Continuous High Pressure Laminate)

[0035] Sheet of transparent paper weighing 25 g/m^2, impregnated with about 10 g/m^2 of dry essence without resin, overlaid on a sheet of decorative paper impregnated with standard melamine resin for a hot-hot cycle, the whole overlaid on a sheet of parchment paper in order to produce a CPL (thickness between 0,15 and 0,40 mm, spoolable) or on several layers of Kraft paper impregnat-

ed with phenol resin in order to produce CHPL (overall thickness between 0,5 and 20 mm).

[0036] Both cases involved the use of a hot-hot pressing cycle, with temperature between 160°C and 200°C, pressure between 40 and 100 kg/cm^2, and speed between 2 and 20 m/min.

Claims

1. A method for producing scented decorative laminates or scented faced panels, the method comprising:

   - using a scented essence to impregnate a sheet of transparent paper without a thermosetting resin;
   - layering a sheet of decorative paper impregnated with a thermosetting resin over a substrate and said sheet of transparent paper impregnated with a scented essence over said sheet of decorative paper;
   - applying pressure and heat to the layering thus obtained for the purpose of cross-linking said thermosetting resin and stably and rigidly bonding said substrate, said sheet of decorative paper and said sheet of transparent paper together.

2. The method according to claim 1, wherein the substrate consists of at least one panel made of chipboard, plywood, OSB, MDF, HDF or the like, or of wood derivatives or substitutes, one or more sheets of Kraft paper impregnated with phenolic resin, one or more sheets of paper impregnated with melamine resins or urea-acrylic resins, and one or more sheets of parchment paper.

3. The method according to claim 1 or 2, wherein the sheet of transparent paper consists of a film of alpha-cellulose paper with no ash content.

4. The method according to any one of the preceding claims, wherein the sheet of transparent paper is of a weight comprised between 15 and 40 g/m^2.

5. The method according to any one of the preceding claims, wherein impregnation of the sheet of transparent paper comprises impregnating or coating the sheet of transparent paper with a solution of said scented essence and drying said solution.

6. The method according to any one of the preceding claims, wherein, following the drying of the solution, the sheet of transparent paper is wrapped in a film of plastic material adapted to preserve the essence and wherein, between the step of impregnating the sheet of transparent paper with the scented essence and the above-mentioned layering step, storage of the sheet of transparent paper is comprised.

7. The method according to any one of the preceding claims, wherein the amount of dry essence on the sheet of transparent paper is greater than or equal to 5 g/m^2 and/or less than or equal to 30 g/m^2.

8. The method according to any one of the preceding claims, wherein applying pressure and heat to said layering is carried out by means of a single-compartment or multi-compartment facing press, for example a static press or a continuous press, with a pressure greater than or equal to 30 Kg/cm^2.

9. The method according to claim 8, wherein a faced panel is produced and said facing press is a static press used with a hot-hot cycle, wherein the temperature is comprised between 160 °C and 200 °C, and/or the duration of the cycle is comprised between 15 s and 60 s, and/or the pressure is comprised between 30 kg/cm^2 and 80 kg/cm^2.

10. The method according to claim 8, wherein a decorative laminate is produced and said facing press is a static press used with a hot-cold cycle, wherein the temperature is comprised between 70 °C and 150 °C, and/or the duration of the cycle is comprised between 30 min and 70 min, and/or the pressure is comprised between 70 kg/cm^2 and 100 kg/cm^2 or said facing press is a continuous press used with a hot-hot cycle, wherein the temperature is comprised between 160 °C and 200 °C, and/or the speed is comprised between 2 and 20 m/min, and/or the pressure is comprised between 40 kg/cm^2 and 100 kg/cm^2.

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EUROPEAN SEARCH REPORT

Application Number
EP 15 19 0331

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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TECHNICAL FIELDS SEARCHED (IPC)
B44C
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	3 May 2016	Björklund, Sofie

CATEGORY OF CITED DOCUMENTS

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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