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(54) **Silk-effect paper material and corresponding manufacturing method**

(57) A silk-effect paper material comprises a substrate, formed by a mixture of cellulose fibres and of fibres with a base of natural and/or synthetic silk and containing at least one polymeric substance (comprising, for example, one or more colophony-based and/or epichlorohydrin-based resins, and/or modified starches), apt to bestow strength on the mixture of fibres, and an inorganic filler (for example, a mineral filler such as carbonate, kaolin, talc, etc.); the paper material has at least one surface treated with at least one surface adhesive and one softening agent and provided with a glossy coating formed by one or more binding polymers and/or waxes, mixed with pigments.

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Description

[0001] The present invention relates to a silk-effect paper material (paper/cardboard) and to the corresponding manufacturing method. More precisely, the paper material of the invention, thanks to an appropriately devised pulp and to a specific surface treatment, loses the typical feel of paper materials and is characterized by a feel similar to that of silk.

[0002] In the paper-making sector there is a constant search for new types of papers having particular appearances and/or finishes, above all designed for wrapping, packaging, production of illustrative material, quality printing, etc.

[0003] Not infrequently, however, these particular effects are obtained at the expense of other characteristics of paper, for example, printability.

[0004] An aim of the present invention is to provide a paper material that will present a feel different from that of traditional paper materials and will at the same time enable a high printing quality.

[0005] The present invention hence regards a paper material and the corresponding manufacturing method as defined in the annexed Claims 1 and 10, respectively.

[0006] Preferred embodiments of the paper material and of the corresponding manufacturing method are defined in the dependent Claims 2 to 9 and 11 to 22, respectively.

[0007] The invention hence provides a silk-effect paper material (paper/cardboard), which, thanks to an appropriately devised pulp and to a specific surface treatment, loses the typical feel of paper materials and is characterized by a feel similar to that of silk.

[0008] The paper material of the invention moreover ensures a high printing quality and enables particular graphic effects to be achieved, which are difficult to obtain with traditional coated papers.

[0009] In detail, the paper material of the invention comprises a substrate that is formed by a mixture of cellulose fibres and fibres of natural silk and/or synthetic silk (polyamide) and contains at least one polymeric substance, capable of bestowing (dry and wet) strength on the mixture of fibres, and an inorganic filler, capable of bestowing softness on the material maintaining good characteristics of machinability.

[0010] The substrate has at least one surface (face) treated with at least one surface adhesive and one softening agent so that the paper material, owing to the combined effect of the composition of the substrate and of the surface treatment, presents a feel similar to that of silk. Clearly, both of the faces of the substrate can be treated in the same way.

[0011] The mixture of fibres can contain fibres with a base of natural and/or synthetic silk in a variable amount, preferably up to approximately 10% of the total of the fibres and more preferably in an amount of less than approximately 3%.

[0012] Preferably, the polymeric substance included in the substrate comprises one or more colophony-based and/or epichlorohydrin-based resins, and/or modified starches, and the inorganic filler is a mineral filler comprising one or more substances selected in the group consisting of carbonates, kaolins, talc, and mixtures thereof.

[0013] The surface adhesive is, for example, an adhesive with a base of starch and/or polyvinyl alcohol and/or acrylic, polyurethane and/or styrene-butadiene polymers.

[0014] The softening agent comprises, for example, sorbitol and/or glycerine.

[0015] Moreover, the paper material according to the invention is provided with a glossy coating, applied on the treated surface (clearly, the paper material can have both of the surfaces treated and provided with a glossy coating).

[0016] In particular, the glossy coating is formed by one or more binding polymers (for example polyurethane-based and/or silicone-based polymers) and/or waxes, mixed with pigments, for example, pigments with a lamellar or flat structure, such as, for example, precipitated calcium carbonate (PCC), calcined and/or lamellar kaolins, in combination with oriented and iridescent metal pigments with lamellar structure.

[0017] The amount of polymer per face is preferably comprised between 5% and 100% with respect to the pigments; the substance of the paper material is comprised between approximately 90 g/m^2 and approximately 350 g/m^2; the amount of glossy coating spread on each face is comprised between approximately 5 g/m^2 and approximately 20 g/m^2.

[0018] The glossy coating may be coloured and/or spread on a coloured substrate; colours in paste form and organic or inorganic pigments are preferably used.

[0019] The paper material just described is obtained, according to a further aspect of the present invention, with the method described below.

[0020] First the substrate is provided, with a technique of formation of paper that is substantially known, for example, on a paper machine.

[0021] Basically, an aqueous pulp is provided of cellulose fibres and of fibres with a base of natural and/or synthetic silk, said pulp containing the polymeric substance (colophony-based and/or epichlorohydrin-based resins, and/or modified starches) and the inorganic filler (carbonates, kaolins, talc, etc.).

[0022] Next, water is removed from the pulp to form the substrate of the paper material.

[0023] This is followed by a step of surface treatment of one or both of the faces of the substrate with an aqueous solution of surface adhesive (for example, an aqueous solution containing 5 to 10 wt% of starch, or acrylic adhesive or other adhesives indicated above) and softening agent (for example, sorbitol and/or glycerine).

[0024] The method further comprises, preferably after the surface treatment with adhesive and softening agent a step of smoothing of the substrate, where the substrate

is smoothed, in particular up to Bendsten ISO 2494 roughness values of less than approximately 50 ml/min and preferably of less than approximately 30 ml/min and indicatively around 20 ml/min, followed by a step of application of the glossy coating described previously.

[0025] Preferably, application of the glossy coating is performed with an air-blade or smoothing-blade coating machine and is followed by a step of drying of the coating, conducted in an infrared oven and/or hot-air oven at a temperature of between approximately 100°C and approximately 180°C and with an oven time of between 0.5 and 4 minutes.

[0026] Finally, the method comprises a step of mechanical treatment of the surface provided with the coating, in particular a smoothing step and/or an embossing step.

[0027] It then remains understood that modifications and variations may be made to the paper material and to the corresponding manufacturing method described and illustrated herein, without thereby departing from the scope of the invention as defined in the annexed claims.

Claims

1. A silk-effect paper material, comprising a substrate, formed by a mixture of cellulose fibres and fibres with a base of natural and/or synthetic silk and containing at least one polymeric substance, apt to bestow strength on the mixture of fibres, and an inorganic filler; and having at least one surface treated with at least one surface adhesive and one softening agent so that the paper material has a silk-like feel.

2. The paper material according to Claim 1, wherein the mixture of fibres contains up to approximately 10% of fibres with a base of natural and/or synthetic silk with respect to the total of the fibres.

3. The paper material according to Claim 1 or Claim 2, wherein the polymeric substance included in the substrate comprises one or more colophony-based and/or epichlorohydrin-based resins, and/or modified starches.

4. The paper material according to any one of the preceding claims, wherein the inorganic filler is a mineral filler and comprises one or more substances selected in the group consisting of carbonates, kaolins, talc, and mixtures thereof.

5. The paper material according to any one of the preceding claims, wherein the surface adhesive is an adhesive with a base of starch and/or polyvinyl alcohol and/or acrylic, polyurethane and/or styrene-butadiene polymers.

6. The paper material according to any one of the preceding claims, wherein the softening agent comprises sorbitol and/or glycerine.

7. The paper material according to any one of the preceding claims, wherein the treated surface is provided with a glossy coating formed by one or more binding polymers and/or waxes, mixed with pigments.

8. The paper material according to Claim 7, wherein the glossy coating comprises pigments with a lamellar or flat structure, such as, for example, precipitated calcium carbonate (PCC), calcined and/or lamellar kaolins, in combination with oriented and/or iridescent metal pigments with lamellar structure.

9. The paper material according to Claim 7 or Claim 8, wherein the binding polymers comprise polyurethane-based and/or silicone-based polymers.

10. A method for manufacturing the paper material according to any one of the preceding claims, comprising the steps of:

    (a) preparing an aqueous pulp of cellulose fibres and of fibres with a base of natural and/or synthetic silk, said pulp containing at least one polymeric substance, apt to bestow strength on the mixture of fibres, and an inorganic filler;
    (b) removing water from the pulp to form a substrate of the paper material; and
    (c) treating at least one surface of the substrate with at least one surface adhesive and one softening agent in such a way as to bestow on the paper material a silk-like feel.

11. The method according to Claim 10, wherein the mixture of fibres contains fibres with a base of natural and/or synthetic silk in an amount of up to approximately 10% of the total of the fibres.

12. The method according to Claim 10 or Claim 11, wherein the polymeric substance included in the substrate comprises one or more colophony-based and/or epichlorohydrin-based resins, and/or modified starches.

13. The method according to any one of Claims 10 to 12, wherein the inorganic filler is a mineral filler and comprises one or more substances selected in the group consisting of carbonates, kaolins, talc, and mixtures thereof.

14. The method according to any one of Claims 10 to 13, wherein the surface adhesive is an adhesive with a base of starch and/or polyvinyl alcohol and/or acrylic, polyurethane and/or styrene-butadiene polymers.

15. The method according to any one of Claims 10 to

14, wherein the softening agent comprises sorbitol and/or glycerine.

16. The method according to any one of Claims 10 to 15, comprising, after the surface treatment with adhesive and softening agent, a step of smoothing the substrate, wherein the substrate is smoothed up to Bendsten ISO 2494 roughness values of less than approximately 50 ml/min, preferably of less than approximately 30 ml/min, and indicatively around 20 ml/min.

17. The method according to any one of Claims 10 to 16, and comprising a step of applying a glossy coating to the treated surface, the glossy coating being formed by one or more binding polymers and/or waxes, mixed with pigments.

18. The method according to Claim 17, wherein the coating comprises pigments with a lamellar or flat structure, such as, for example, precipitated calcium carbonate (PCC), calcined and/or lamellar kaolins, in combination with oriented and iridescent metal pigments with lamellar structure.

19. The method according to Claim 17 or Claim 18, wherein the binding polymers comprise polyurethane-based and/or silicone-based polymers.

20. The method according to any one of Claims 17 to 19, wherein the step of application of the glossy coating is performed with an air-blade or smoothing-blade coating machine.

21. The method according to any one of Claims 17 to 20, comprising a step of drying of the coating, conducted in an infrared oven and/or hot-air oven at a temperature of between approximately 100°C and approximately 180°C and with an oven time of between approximately 0,5 and approximately 4 minutes.

22. The method according to any one of Claims 17 to 21, comprising a step of mechanical treatment of the surface provided with the glossy coating, in particular a smoothing step and/or an embossing step.

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EUROPEAN SEARCH REPORT

Application Number
EP 12 16 7033

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Place of search	Date of completion of the search	Examiner
Munich	22 August 2012	Ponsaud, Philippe

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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