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(54) **METHOD FOR MAKING A COVERED FABRIC AND RELATIVE COVERED FABRIC**

- (57) Described is a method for making a covered fabric, comprising the steps of preparing a support fabric, preparing a solution of polyurethane particles dispersed in water, foaming said solution of polyurethane particles
- in air, stabilising said foamed polyurethane on said support fabric and pressing said foamed polyurethane on said support fabric in such a way as to eliminate said air and obtain a layer of polyurethane.

Description

[0001] This invention relates to a method for making a covered fabric.

[0002] The invention also relates to a relative covered fabric obtained using the above-mentioned method.

[0003] In particular, the invention relates to a method for making a fabric covered with at least one layer of polyurethane spread on it.

[0004] The term "covered fabric" means a base fabric (or support fabric) on which a layer of plastic material, for example polyurethane, is applied.

[0005] The application of the layer of plastic material allows the end product to be given new technical and aesthetic features.

[0006] Covered fabrics are widely used, for example, in the production of footwear, items of clothing or accessories, and more generally in the clothing, automotive or furnishing sectors.

[0007] Currently, the layer of plastic material which is applied on the support fabric is made, for example, of polyurethane or PVC (polyvinylchloride), depending on the technical features required.

[0008] Polyurethane lends itself, for example, to various applications in which characteristics of softness, elasticity and breathability are required.

[0009] With reference to the prior art methods for making covered fabrics and in particular to the prior art methods wherein the layer of plastic material is made of polyurethane, it may be stated that a good end product can be made available to a user, which, however, is not free from drawbacks.

[0010] In particular, a major drawback is due to the fact that the prior art methods are often unable to provide a product wherein the plastic layer has a suitable structure, in terms, for example, of density and thickness.

[0011] This is because the polyurethane molecules, according to the prior art methods, are substantially unable to layer themselves, resulting in the making of layers with a very reduced thickness.

[0012] In particular, according to the prior art methods, an attempt to layer the polyurethane to increase the thickness leads to surface defects which are unacceptable in terms of appearance.

[0013] Polyvinylchloride, on the other hand, lends itself, for example, to applications in which a predetermined degree of structure is required.

[0014] For example, using polyvinylchloride it is possible to obtain a layer of plastic material with a high density and high thickness.

[0015] However, the prior art methods based on the application of a plastic layer of polyvinyl chloride are also not free from drawbacks.

[0016] In effect, although this material guarantees a good structure, it has several defects since it is unable to guarantee optimum technical and mechanical characteristics, in terms of softness to touch, elasticity, flexibility and breathability.

[0017] Another drawback of the prior art methods is due to the fact that they do not always allow a product to be provided which is inexpensive and simple to make.

[0018] Another disadvantage of the prior art methods is due to the fact that they do not always allow a product to be supplied which is environmentally friendly and with a low environmental impact.

[0019] The aim of this invention is therefore to provide a method for making a covered fabric and a relative covered fabric which is able to overcome the drawbacks of the prior art.

[0020] A further aim of this invention is to provide a method for making a covered fabric and relative covered fabric which are able to provide a product with optimised technical and mechanical characteristics.

[0021] Another aim of the invention is to provide a method for making a covered fabric and relative covered fabric which are simple and inexpensive to implement (method) and make (product).

[0022] Another aim of this invention is to provide a method for making a covered fabric and relative covered fabric which have a low environmental impact.

[0023] According to the invention, these aims and others are achieved by a method for making a covered fabric and the relative covered fabric comprising the technical features described in the accompanying claims.

[0024] The technical features of the invention, with reference to the above-mentioned aims, are clearly described in the accompanying claims and its advantages are apparent from the detailed description which follows.

[0025] The method for making a covered fabric according to this invention, hereinafter also referred to simply as "method", comprises the step of preparing a support fabric.

[0026] The term "support fabric" is used to mean any fabric generated by an interlacing of threads of natural or synthetic origin.

[0027] Advantageously, the support fabric comprises cotton or polyester, or a mixture of them.

[0028] The method according to this invention comprises the step of preparing a solution of polyurethane particles dispersed in water.

[0029] Advantageously, the step of preparing a solution comprises a step of preparing particles of polyurethane having at least 30% by weight of polyurethane derived from renewable vegetable source.

[0030] This allows the effects of the environmental impact to be limited, guaranteeing the possibility of making available an environmentally-friendly and sustainable product.

[0031] Advantageously, the step of preparing a solution comprises the step of mixing surface-active substances with the solution, in such a way as to disperse the polyurethane particles in water.

[0032] The term "surface-active substances" refers to substances with a large emulsifying capacity.

[0033] In particular, the surface-active substances are partly polar and partly apolar.

[0034] The apolar part of these surface-active substances attaches itself to the polyurethane particles (neutral base) making them charged.

[0035] In this way, these charged polyurethane particles disperse in the water floating, instead of stabilising on the bottom as would occur without the use of the surface-active substances.

[0036] The method according to this invention also comprises a step of foaming with particles of a gaseous mixture the solution of polyurethane particles, to obtain foamed polyurethane.

[0037] In this way, the density of the solution is reduced to increase the thickness.

[0038] Advantageously, the foaming step is performed by introducing air.

[0039] The method according to this invention comprises a step of spreading at least one surface of the support fabric with the foamed polyurethane to obtain a spread support fabric.

[0040] Following the above-mentioned spreading step, the spread support fabric has a layer of plastic material (air foamed polyurethane) characterised by a high thickness and low density.

[0041] The method according to this invention comprises a step of stabilising the foamed polyurethane on the spread support fabric.

[0042] Advantageously, the stabilising step is performed by means of an oven.

[0043] By using an oven, that is to say, by increasing the temperature of the support fabric and of the foamed polyurethane, the quantity of water present in the polyurethane evaporates, leaving a solid microcellular structure on the support fabric.

[0044] The method according to this invention comprises a step of pressing the foamed polyurethane on the support fabric in such a way as to eliminate the air and obtain a layer of polyurethane.

[0045] The pressing step allows the air to be eliminated so as to increase the density of the polyurethane layer, whilst maintaining a high thickness.

[0046] This step therefore allows an optimum structure to be given to the finished product, whilst maintaining unchanged all the advantageous features of the polyurethane (that is, for example, softness to touch, flexibility, elasticity and breathability).

[0047] Advantageously, the pressing step is performed by means of a pair of rollers, that is to say, moving the spread support fabric through the pair of rollers.

[0048] Alternatively, the pressing step is performed by means of a press.

[0049] The method according to this invention also comprises a step of finishing the covered fabric.

[0050] The finishing step comprises a step of spreading a further layer of alcoholic-based polyurethane on the covered fabric.

[0051] The term "alcoholic-based polyurethane" means a polyurethane dissolved in alcohol with a high molecular weight, for example greater than 80

grams\mole (g\mol). For example, alcoholic-based polyurethanes which can be used in this invention are: methoxypropanol, dipropylene methyl ether, dimethyl carbonate.

5 **[0052]** This makes it possible to define in an optimum manner the colour of the finished product and make it pleasant to the touch.

[0053] The finishing step also comprises a step of printing a graphical pattern on the covered fabric.

10 **[0054]** Advantageously, the printing step is performed in a digital manner.

[0055] Alternatively, the printing step is performed by means of printing cylinders.

15 **[0056]** The finishing step comprises a step of embossing the covered fabric.

[0057] This embossing step makes it possible to form protrusions on the covered fabric and to give it a desired degree of sheen and roughness.

[0058] The invention also relates to a covered fabric made using the method described above.

20 **[0059]** The covered fabric according to this invention comprises a support fabric and a first plastic layer defined by the above-mentioned polyurethane particles.

25 **[0060]** The plastic layer is stabilised on the support fabric.

[0061] As explained above, the method according to this invention allows the production of the plastic layer with a high thickness and high density.

30 **[0062]** Advantageously, the covered fabric according to the invention comprises a second plastic layer of alcoholic-based polyurethane.

[0063] Advantageously, moreover, the covered fabric comprises a graphical pattern made on the above-mentioned second plastic layer.

35 **[0064]** Advantageously, the second plastic layer has a rough upper surface.

[0065] The method for making a covered fabric and relative covered fabric according to the invention overcome the above-mentioned drawbacks and achieve important advantages.

40 **[0066]** The first advantage achieved by the method for making a covered fabric and relative covered fabric according to this invention is due to the fact that an end product is provided which is optimised in terms of technical and mechanical characteristics.

[0067] In other words, the covered fabric made using the method according to this invention comprises a plastic layer which is able to combine the typical advantageous properties of polyurethane (breathability, softness, flexibility and resistance to twisting), with a high degree of density and thickness.

45 **[0068]** Another advantage achieved by the method for making a covered fabric and the relative covered fabric according to this invention is due to the fact that it provides an environmentally-friendly product with a low environmental impact.

Claims

1. A method for making a covered fabric, comprising the following steps:
 - preparing a support fabric;
 - preparing a solution of polyurethane particles dispersed in water;
 - foaming said solution of polyurethane particles with particles of a gaseous mixture, to obtain foamed polyurethane;
 - spreading at least one surface of said support fabric with said foamed polyurethane to obtain a spread support fabric;
 - stabilising said foamed polyurethane on the support fabric heating said support fabric and said foamed polyurethane in such a way that the water present in said foamed polyurethane evaporates defining a solid microcellular polyurethane structure on the support fabric;
 - pressing said foamed polyurethane on said support fabric in such a way as to eliminate said gaseous mixture.

2. The method according to claim 1, **characterised in that** said foaming step is performed by introducing air.

3. The method according to any one of the preceding claims, **characterised in that** said stabilising step comprises the steps of:
 - preparing an oven;
 - moving said spread support fabric through said oven in such a way that the water present in said polyurethane evaporates at least partly.

4. The method according to any one of the preceding claims, **characterised in that** said step of preparing a solution of polyurethane particles dispersed in water comprises a step of preparing polyurethane particles having at least 30% by weight of polyurethane derived from a renewable vegetable source.

5. The method according to any one of the preceding claims, **characterised in that** said step of preparing a solution comprises the step of mixing surface-active agents with said solution in such a way as to disperse said polyurethane particles in water.

6. The method according to any one of the preceding claims, **characterised in that** said pressing step is performed by a pair of rollers.

7. The method according to any one of the preceding claims, **characterised in that** it comprises a step of finishing said covered fabric.

8. The method according to the preceding claim, **characterised in that** said finishing step comprises the steps of:
 - spreading a further alcoholic-based layer of polyurethane on said covered fabric;
 - printing a graphical pattern on said covered fabric.

9. The method according to the preceding claim, wherein said alcoholic-based polyurethane comprises a polyurethane dissolved in alcohol with a molecular weight greater than 80 grams\mole (g\mol).

10. A covered fabric made using the method according to claims 1 to 9.



EUROPEAN SEARCH REPORT

Application Number

EP 24 18 1202

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EPO FORM 1503 03:82 (P04C01)

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Y	* paragraph [0024] * * paragraph [0040] * * paragraphs [0044] - [0047] * * example 3 * * claims 1, 4, 20 *	8, 9	
X	GB 1 283 250 A (DUNLOP HOLDINGS LTD [GB]) 26 July 1972 (1972-07-26)	10	
A	* column 2, lines 69-79 * * claims 1, 11 *	1-9	
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A	* claim 1 and 7 * * examples IX-XI *	1-9	TECHNICAL FIELDS SEARCHED (IPC) D06N
Y	CN 112 575 594 B (LIN ZHENMING) 24 May 2022 (2022-05-24) * claims 1, 3, 6 *	8, 9	
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 24 October 2024	Examiner Rella, Giulia
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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