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(54) **A process of printing fabrics and its products**

Verfahren zum Bedrucken von Geweben und von dessen Produkten

Procédé d'impression de tissus et de ses produits

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Description

[0001] The present invention relates to a process of printing fabrics and to the printed fabric products thus obtained.

[0002] Printing fabric is a process by which a colour is imparted to selected portions of a textile fabric; there are known several different methods of printing fabric, such as screen printing, rotation printing, jet printing; different dyes and pigments can be applied to the fabric, such as reactive dyes, discharge dyes etcetera.

[0003] Fabric can be printed as a flat piece or as a finished (or almost finished) garment. In fabric printing a minimum amount of fabric is required for printing a colour. Printing a garment rather than printing a flat fabric, is preferred by the clothes producers because it makes it possible to decide for the colour of printing to be done at the last minute. However, printing a garment is much more difficult and more expensive than printing a flat fabric piece.

[0004] Another problem with printing fabric is that in general the printed portions has a new look that does not agree with the faded look of the rest of the garment.

[0005] It is an aim of the present invention to solve the above problems and to provide a process of printing fabrics that is easy and not expensive and that could be used to provide on the fabric, namely a cotton denim fabric, printed patterns of the required colour in a short time.

The process should be useful in particular to provide printed patterns on a cotton denim fabric with a faded, i.e. worn, look.

[0006] The above aim is reached by means of the present invention that provides a printing method according to claim 1, in which a fabric is printed with a composition comprising 4-40% by weight, preferably to 4 to 25% by weight of at least one strong base MOH, where M is an alkali metal, water and a thickener, said composition being not suitable to provide a color on said fabric, and treating the printed fabric with a dye that is suitable to react with said base to provide a coloured printed area corresponding to the area where the basic formulation was applied. The composition is free of amines and of compounds having amino groups; preferably the composition is not coloured. The colour is imparted at least to the area where the composition containing the base MOH has been applied.

Strong bases are e.g. KOH, CsOH, NaOH, LiOH, RbOH; preferably M is Na or K. In the following description reference will be made to Na and K; the combination of these two metals with the other features of the invention is expressly disclosed with this reference.

[0007] The dye is preferably in the form of a solution, e.g. an aqueous bath.

[0008] The printed fabric, not yet treated with the dye, is dried before the subsequent step of imparting a colour. Before the step of imparting a colour to the fabric, the fabric printed with the non-coloured composition is heat-

ed to a temperature of at least 90 °C, preferably in the range of 130°C to 220°C.

[0009] The fabric to be printed with the MOH formulation is not yet coloured and the bath gives a colour both to the fabric and to the printed area with different intensity. This makes it possible to obtain a worn look without having to use the other standard methods or with a limited use to said methods. Any type of textile fabric that is resistant to the basic composition of the invention can be used. In the case of denim fabrics, suitable fabrics have a weight in the range of 50-500 g/m².

[0010] The dye is provided in a known way in an aqueous dyeing bath and is selected from dyes suitable to react with and be "fixed" on the printed areas of the fabric more than on the remaining parts of the fabric. The concentration of the dye in the bath is such as to avoid imparting an excessive colouring to the fabric and to allow to show the difference in colouring of the printed areas and the remaining fabric. A suitable concentration of the dye in the dyeing bath is 0,1% - 10% by weight on the weight of the fabric.

[0011] Suitable dyes are reactive dyes, sulphur dyes, direct dyes and vat dyes.

[0012] A composition suitable for the process is a composition that comprises 4% to 40% by weight of at least one strong base MOH, where M is an alkali metal, water and a thickener, has a viscosity suitable to be printed on fabric and is free from amines and amino groups in general.

[0013] Preferably, the strong base is NaOH or KOH.

[0014] To prepare the NaOH and/or KOH composition, water, a concentrated solution of MOH are mixed together, then a thickener is added to reach the viscosity required for the printing step on a known printing machine.

[0015] Suitable printing machines are rotary screen and flatbed screen devices.

Suitable concentrated solutions of MOH for preparing the invention composition are those having a concentration within the range of 8 to 48 Be (Baume degrees), preferably 35 to 45 Be, corresponding to ranges of 1 to 10 moles/litre and 5 to 8 moles/litre, respectively.

[0016] In general, the amount of MOH solution in the composition is within the range of 30% to 70% by weight of the final composition. The amount of thickener is enough to reach a viscosity suitable for the composition to be used on a printing machine for textile printing; suitable viscosities are in the range of 5 to 40 dPa.s. Suitable thickeners are thickeners for aqueous solutions that are resistant to highly basic conditions such as in the invention composition. An example of suitable thickener is anionic pregelatinized carboxymethylated starch which is able to resist to alkali solutions.

[0017] The amount of MOH-containing composition applied to the fabric is within the range of 50 to 500 g/m², preferably within 70 to 150 g/m². The fabric is generally a flat piece of fabric but it can also be in the form of a part of a garment.

[0018] It is therefore a further object of the invention a

garment according to claim 10.

[0019] The invention has several advantages over the prior art. It makes it possible to prepare a fabric with a pre-printed pattern and to subsequently decide what will be the final colour to be imparted to the fabric/pre-printed area. Another advantage is that by avoiding the use of amines and molecules having amino groups in general, the final printed coloured area will have a worn look as the rest of the fabric.

[0020] The invention will now be further described with reference to the following non-limiting example.

EXAMPLE 1

Preparation of a base composition.

[0021] 528 g of an NaOH concentrated solution having 38 Be were added to 444,5 g H₂O and mixed with 27,5 g of anionic pregelatinized carboxymethylated starch as a thickener. The composition was thoroughly stirred and a viscosity of 30 dPa.s(decipascal-seconds) was reached.

EXAMPLE 2

Printing of a fabric.

[0022] A denim fabric of about 200 g/m² was screen printed with a composition according to example 1. The printed fabric shows no difference in the colours of the printed area and of the non-printed area. The fabric was dried at 145°C for 1 minute. The dry fabric was immersed in a bath containing the following compounds;

Dye: solution A colour beige, 20 ml.

Water up to 1 lt.

Dye solution A is obtained by combining the following dyes:

8,4 g solar brun RLNI

5,8 g indosol yellow SFGL

The dry fabric is dyed in a bath containing 20 ml of the prepared dye solution A per litre of water at 60°C for 20 minutes.

The treated fabric was then removed from the bath and dried. The area previously printed with the basic composition of example 1 is coloured in dark beige while the remaining fabric is light in colour.

Claims

1. A method for printing a fabric, **characterized in** comprising the following steps:

a) applying to selected areas of a fabric a com-

position comprising

- 4% to 40% by weight of at least one strong base MOH, where M is an alkali metal;
- water and a thickener;

said composition having a viscosity suitable to be printed on said fabric and being free from amines and amino groups;

a1) drying said printed fabric; and
b) treating the dry, printed, fabric with a dye that is suitable to react with said base to impart a colour on said fabric area where said composition was applied, said dye becoming fixed on the said printed areas of the fabric more than on the remaining parts of the fabric.

2. A method according to claim 1, wherein said fabric is part of a garment.

3. A method according to claims 1 or 2, wherein said printed fabric is part of a garment before said step b).

4. A method according to any previous claim, wherein said printed fabric is heated to a temperature of at least 90°C, preferably in the range of 130°C to 220°C before said step of imparting a colour.

5. A method according to any previous claim, wherein said dye is provided in a bath and is selected from reactive, sulphur, direct and vat dyes.

6. A method according to any previous claim, wherein M is Na or K.

7. A method according to claim 6, wherein said base composition is obtained from a solution of NaOH having a concentration within the range of 8 to 48 Be, preferably 35 to 45 Be.

8. A method according to claim 7, wherein the amount of MOH solution is within the range of 30% to 70% by weight of the final composition.

9. A method according to any previous claim, wherein the amount of said MOH-containing composition applied to said fabric is within the range of 30 to 500 g/m², preferably within 40 to 250 g/m².

10. A printed dry garment as obtainable through a process according to step a1) of claim 1 and any depending claim, said garment including an area comprising a composition free from amines and amino groups and comprising at least one strong base MOH, where M is an alkali metal, and a thickener, the printed garment further comprising an additional colour derived from step b) of claim 1, whereby said dye is fixed on the said printed areas of the fabric more than on the

remaining parts of the fabric, so that a colour is provided on both the fabric and the printed area with different intensity.

Patentansprüche

1. Verfahren zum Bedrucken eines Gewebes, **dadurch gekennzeichnet, dass** es die folgenden Schritte umfasst:

a) Aufbringen einer Zusammensetzung, umfassend

- 4 bis 40 Gew.-% mindestens einer starken Base MOH, wobei M ein Alkalimetall ist;
- Wasser und ein Verdickungsmittel;

auf ausgewählte Bereiche eines Gewebes, wobei die Zusammensetzung eine Viskosität aufweist, die zum Bedrucken eines Gewebes geeignet ist, und die frei von Aminen und Aminogruppen ist;

a1) Trocknen des bedruckten Gewebes; und

b) Behandeln des getrockneten bedruckten Gewebes mit einem Farbstoff, der geeignet ist, mit der Base zu reagieren, um dem Gewebebereich, auf den die Zusammensetzung aufgetragen wurde, eine Farbe zu verleihen; wobei der Farbstoff auf den bedruckten Bereichen des Gewebes stärker als auf den übrigen Bereichen des Gewebes fixiert wird.

2. Verfahren nach Anspruch 1, wobei das Gewebe Teil eines Kleidungsstücks ist.

3. Verfahren nach Anspruch 1 oder 2, wobei das bedruckte Gewebe Teil eines Kleidungsstücks vor dem Schritt b) ist.

4. Verfahren nach einem der vorhergehenden Ansprüche, wobei das bedruckte Gewebe vor dem Schritt des Verleihs einer Farbe auf eine Temperatur von mindestens 90 °C, vorzugsweise im Bereich von 130 °C bis 220 °C, erwärmt wird.

5. Verfahren nach einem der vorhergehenden Ansprüche, wobei der Farbstoff in einem Bad bereitgestellt wird und aus Reaktivfarbstoffen, Schwefelfarbstoffen, Direktfarbstoffen und Küpenfarbstoffen ausgewählt wird.

6. Verfahren nach einem der vorhergehenden Ansprüche, wobei M Na oder K ist.

7. Verfahren nach Anspruch 6, wobei die Basezusammensetzung aus einer Lösung von NaOH mit einer Konzentration im Bereich von 8 bis 48 Be, vorzugs-

weise 35 bis 45 Be, erhalten wird.

8. Verfahren nach Anspruch 7, wobei die Menge an MOH-Lösung im Bereich von 30 bis 70 Gew.-% der Endzusammensetzung liegt.

9. Verfahren nach einem der vorhergehenden Ansprüche, wobei die Menge der auf das Gewebe aufgetragenen MOH-haltigen Zusammensetzung im Bereich von 30 bis 500 g/m², vorzugsweise im Bereich von 40 bis 250 g/m², liegt.

10. Bedrucktes getrocknetes Kleidungsstück, erhältlich durch ein Verfahren gemäß Schritt a1) von Anspruch 1 und einem der abhängigen Ansprüche, wobei das Kleidungsstück einen Bereich umfasst, der eine Zusammensetzung frei von Aminen und Aminogruppen umfasst und mindestens eine starke Base MOH umfasst, wobei M ein Alkalimetall ist, und ein Verdickungsmittel umfasst, wobei das bedruckte Kleidungsstück überdies eine zusätzliche Farbe umfasst, die von dem Schritt b) von Anspruch 1 abgeleitet ist, wobei der Farbstoff auf den bedruckten Bereichen des Gewebes stärker als auf den übrigen Bereichen des Gewebes fixiert wird, so dass eine Farbe sowohl auf dem Gewebe als auch dem bedruckten Bereich mit unterschiedlicher Intensität bereitgestellt ist.

Revendications

1. Procédé pour imprimer un tissu, **caractérisé en ce qu'il comprend les étapes suivantes** :

a) application à des zones choisies d'un tissu d'une composition comprenant

- 4 % à 40 % en poids d'au moins une base forte MOH, où M est un métal alcalin ;
- de l'eau et un épaississant ;

ladite composition ayant une viscosité appropriée pour être imprimée sur ledit tissu et étant exempte d'amines et de groupes amino ;

a1) séchage dudit tissu imprimé ; et

b) traitement du tissu imprimé sec avec un colorant qui est approprié pour réagir avec ladite base pour communiquer une couleur sur ladite zone de tissu où ladite composition a été appliquée, ledit colorant se fixant davantage sur lesdites zones imprimées du tissu que sur les parties restantes du tissu.

2. Procédé selon la revendication 1, dans lequel ledit tissu fait partie d'un vêtement.

3. Procédé selon les revendications 1 ou 2, dans lequel

ledit tissu imprimé fait partie d'un vêtement avant ladite étape b).

4. Procédé selon l'une quelconque revendication précédente, dans lequel ledit tissu imprimé est chauffé à une température d'au moins 90 °C, de préférence dans la plage de 130 °C à 220 °C avant ladite étape consistant à communiquer une couleur. 5
5. Procédé selon l'une quelconque revendication précédente, dans lequel ledit colorant est fourni dans un bain et est sélectionné à partir des colorants réactifs, de soufre, directs et de cuve. 10
6. Procédé selon l'une quelconque revendication précédente, dans lequel M est Na ou K. 15
7. Procédé selon la revendication 6, dans lequel ladite composition de base est obtenue à partir d'une solution de NaOH ayant une concentration dans la plage de 8 à 48 Be, de préférence 35 à 45 Be. 20
8. Procédé selon la revendication 7, dans lequel la quantité de solution de MOH est dans la plage de 30 % à 70 % en poids de la composition finale. 25
9. Procédé selon l'une quelconque revendication précédente, dans lequel la quantité de ladite composition contenant MOH appliquée audit tissu est dans la plage de 30 à 500 g/m², de préférence de 40 à 250 g/m². 30
10. Vêtement imprimé sec pouvant être obtenu par l'intermédiaire d'un processus selon l'étape a1) de la revendication 1 et de n'importe quelle revendication dépendante, ledit vêtement incluant une zone comprenant une composition exempte d'amines et de groupes amino et comprenant au moins une base forte MOH, où M est un métal alcalin, et un épaississant, le vêtement imprimé comprenant en outre une couleur supplémentaire dérivée de l'étape b) de la revendication 1, moyennant quoi ledit colorant est fixé davantage sur ladite zone imprimée du tissu que sur les parties restantes du tissu, de sorte qu'une couleur est fournie à la fois sur le tissu et sur la zone imprimée avec une intensité différente. 35
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