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# (54) Process for the manufacture of a pure cashmere textile article

Verfahren zum Herstellen eines reinen Kaschmirtextilartikels

Procédé de fabrication d'un article textile pur cachemire

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Remarks:
The file contains technical information submitted after the application was filed and not included in this specification

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## Description

**[0001]** The present invention refers to a process for the manufacture of a textile article made of pure cashmere, whether a literally called fabric or a knitted fabric or a jersey fabric.

**[0002]** The cashmere is known to be a valuable material that is highly demanded by high level customs.

**[0003]** At the same time it is also a material that at its pure state and at a count higher than a determined maximum value has such a low mechanical strength to make its weaving impossible.

**[0004]** The known technique, as described in the Italian patent application No. 1 306 232 in the name of the applicant, which was laid open to public inspection on 28 October 1999, provides that a very thin yarn of cashmere is assisted by a vegetable support yarn, as for instance cotton, that is then eliminated by a devouration operation by means of an acid development salt.

**[0005]** The devouration does not allow to eliminate the residues of the vegetable thread completely when working in selvedge.

**[0006]** In addition the use of a vegetable reinforcement thread involves supply and costs problems.

**[0007]** In view of the state of the art herein described, purpose of the present invention is to realise a process that allows to obtain a high count pure cashmere textile article at a low price.

**[0008]** According to the present invention, such purpose is attained by means of a process as defined in claim 1.

**[0009]** The characteristics and the advantages of the present invention will become evident from the following detailed description of an embodiment thereof that is illustrated as a non limiting example in the enclosed drawings, in which:

Figure 1 shows a doubled cashmere and synthetic yarn before the weaving;
Figure 2 shows a portion of cloth weave obtained by weaving coupled yarns as the one in Figure 1;
Figure 3 shows the same portion of cloth after the operation of dissolution has been performed.

**[0010]** The yarn of cashmere has a count varying from 85 dtex (50000 Nm) to 200 dtex (120000 Nm), size beyond which the yarn of cashmere has a sufficient strength to allow its weaving without any support yarn. According to a currently preferred embodiment of the present invention the yarn of cashmere being used has a count of 130 dtex (80000 Nm).

**[0011]** The synthetic fibre yarn can be of the type known by the trade name of Kuralon K-II, having the followings characteristics:

| Technical Characteristics | Values |
|---|---|
| **Flock** | |
| Fineness | 3.2 ± 0.3 dtex |
| Length: | |
| square cut | 38 and 51 |
| oblique cut (CV 35%) | 85 |
| Strength | 8.5 ± 1.5 cN/dtex |
| Elongation | 11 ± 4 % |
| **Bale** | |
| Fineness | 2.2 ± 0.3 dtex |
| Cut (diagonal) | 85 ± 30 mm |
| Weight | 20 g/m |
| **Solubility in water** | |
| Fibre as such | 80 ± 10 °C |
| Mixed in fabric | 90 ± 10 °C |
| **Vaporisation** | |
| Temperature: | |
| cardboard tubes | 90 °C max |
| plastic tubes | 80 °C max |
| **Dissolution** | |
| Water temperature: | |
| soak ( for ca. 30 min) | 85 - 95 °C |
| rinse ( for ca. 10 min) | 40 °C |
| Water/fabric ratio | 50/1 by weight |
| Water acidity | 4 - 4.5 pH |

**[0012]** The doubling operation is carried out in a sense opposite to the one of the individual yarn, that is with S torsion.

**[0013]** The doubled yarn 3 thus obtained undergoes an operation of weaving according to the known art, for example in order to obtain a cloth weave as the one shown in Figure 2.

**[0014]** Other types of weave can be used, as for instance Batavia 2/2, Saglie, etc., up to Jacquard. In addition it is possible to provide for a knitted or jersey weaving.

**[0015]** The synthetic yarn is eliminated in a slightly acid liquid solution, having a pH comprised between 4 and 4.5, when the temperature of the solution reaches 85 °C by means of an operation that is defined of dissolution.

**[0016]** This is made possible owing to the dissolution characteristics provided by Kuralon K-II.

**[0017]** Said synthetic material does not leave any kind of residue in the fabric thus obtained even if working in selvedge thus guaranteeing much higher quality standard than the ones that can be obtained by the known techniques.

**[0018]** The fabric thus obtained is then submitted to a

dyeing process, for example comprising soaking in a neutral bath for 10 min at 80 °C, dyeing with acid colours for 100 min at 80 °C and fulling with wet enzymatic detergents at room temperature for 25 min.

**[0019]** Finally the article thus obtained is dried and submitted to vapour.

**[0020]** It is clear that the above described process is characterized by two fundamental operations, to associate cashmere fibres with synthetic fibres and to dissolve such synthetic fibres by means of a slightly acid liquid solution at high temperature.

**[0021]** The association of the two types of fibres is carried out by an doubling operation of a yarn of cashmere with a synthetic yarn, as previously described with reference to the drawings.

## Claims

1. Process for the manufacture of a textile article of high count pure cashmere, **characterized in that** it comprises the following sequence of steps:

   (a) doubling of a first yarn (1) of high count pure cashmere having a count comprised between 85 dtex and 200 dtex with a second yarn (2) of synthetic fibres dissolvable in slightly acid liquid solution at high temperature, the doubling operation being carried out in a sense opposite to the one of the individual yarn, that is with S torsion;
   (b) weaving of the doubled yarns (1,2);
   (c) dissolution of said second yarns (2) by means of a slightly acid liquid solution having a pH of 4-4.5 and a temperature of 85-95°C.

2. Process according to claim 1, **characterized in that** the yam (1) of pure cashmere has a count of 130 dtex.

3. Process according to claim 1, **characterized in that** the yam (2) of synthetic fibres has a bale fineness of 2.2 ± 0.3 dtex, a square cut length of 38 and 51 mm, an oblique cut length of (CV 35%) 85 mm, a strength of 8.5 ± 1.5 cN/ dtex and an elongation 11 ± 4%.

4. Process according to claim 1, **characterized in that** the yam (2) of synthetic fibres has a bale fineness 2.2 ± 0.3 dtex, a diagonal cut of 85 ± 30 mm and a weight of 20 g/ m.

5. Process according to claim 3, **characterized in that** the yarn (2) of synthetic fibres has a temperature of solubility in water of 80 ± 10 °C as yarn per se and of 90 ± 10 °C as yam mixed to fabric.

6. Process according to claim 3, **characterized in that** the yam (2) of synthetic fibres has a vaporisation temperature of 90 °C max for cardboard tubes and of 80 °C max for plastics tubes.

7. Process according to claim 3, **characterized in that** it uses for the dissolution a water temperature of 85-95 °C for the soaking operation (for around 30 min), and of 40 °C for the rinse operation (for around 10 min), a water/fabric ratio of 50/ 1 by weight and a pH of 4- 4.5 as acidity of the water.

8. Process according to claim 1, **characterized in that** the dissolution is preceded by processes of soaking, dyeing and fulling of the fabric.

9. Process according to claim 8, **characterized in that** the soaking of the fabric is carried out in a neutral bath.

10. Processes according to claim 8, **characterized in that** the dyeing is carried out by means of acid colours.

11. Process according to claim 8, **characterized in that** the fulling is carried out by means of wet enzymatic detergents.

## Patentansprüche

1. Verfahren zum Herstellen einer Textilie aus reinem Kaschmir, **dadurch gekennzeichnet, dass** es die folgende Schrittfolge aufweist:

   (a) Doublierbehandlung eines ersten Garns (1) aus reinem Kaschmir, weiches eine Dichte hat, die zwischen 85 dtex und 200 tdex liegt, mit einem zweiten Garn (2) aus synthetischen Fasern, welche in einer geringfügig sauren flüssigen Lösung bei hoher Temperatur löslich sind, wobei die Doublierbehandlung in einer Richtung ausgeführt wird, die entgegengesetzt zu der Richtung des einzelnen Garns gerichtet ist, d.h. mit einer s-Tordierung;
   (b) Weben der doublierten Garne (1, 2);
   (c) Auflösen der zweiten Garne (2) mit Hilfe einer geringfügig sauren, flüssigen Lösung, die einen pH von 4 - 4,5 hat, und bei einer Temperatur von 85°C bis 95°C.

2. Verfahren nach Anspruch 1, **dadurch gekennzeichnet, dass** das Garn (1) aus reinem Kaschmir eine Dichte von 130 dtex hat.

3. Verfahren nach Anspruch 1, **dadurch gekennzeichnet, dass** das Garn (2) aus synthetischen Fasern eine Ballenfeinheit von 2,2 ± 0,3 dtex, eine quadratische Schnittlänge von 38 bis 51 mm und eine Schrägschnittlänge (CV 35%) 85 mm, eine Festig-

keit von 8,5 ± 1,5 cN/dtex und eine Dehnung von 11 ± 4 % hat.

**4.** Verfahren nach Anspruch 1, **dadurch gekennzeichnet, dass** das Garn (2) aus synthetischen Fasern eine Ballenfeinheit von 2,2 ± 0,3 dtex, eine Diagonalschnittlänge von 85 ± 30 mm und ein Gewicht von 20 g/m hat.

**5.** Verfahren nach Anspruch 3, **dadurch gekennzeichnet, dass** das Garn (2) aus synthetischen Fasern eine Löslichkeitstemperatur in Wasser von 80 ± 10°C beim Garn als solchem und von 90 ± 10°c bei dem zum Gewebe verarbeiteten Garn hat.

**6.** Verfahren nach Anspruch 3, **dadurch gekennzeichnet, dass** das Garn (2) aus synthetischen Fasern eine Verdampfungstemperatur von 90°c maximal für Kartonrohre, und von 80°C maximal für Kunststoffrohre hat.

**7.** Verfahren nach Anspruch 3, **dadurch gekennzeichnet, dass** zur Lösung eine Wassertemperatur von 85°C bis 95°C, für die Tauchbadbehandlung (eine Zeit von etwa 30 Minuten) und 40°C für die Spülbehandlung (für etwa 10 Minuten), ein Wasser/Gewebeverhältnis von 50/1 gewichtsbezogen und ein pH von 4 - 4,5 als Säurestärke des Wassers genommen werden.

**8.** Verfahren nach Anspruch 1, **dadurch gekennzeichnet, dass** die Lösung durch die Tauchbadbehandlungen, die Färbebehandlung und Walkbehandlungen des textilen Materials fortgesetzt wird.

**9.** Verfahren nach Anspruch 8, **dadurch gekennzeichnet, dass** die Tauchbadbehandlungen des textilem Material in einem neutralen Bad vorgenommen wird.

**10.** Verfahren nach Anspruch 8, **dadurch gekennzeichnet, dass** die Färbebehandlung mit Hilfe von sauren Farbstoffen vorgenommen wird.

**11.** Verfahren nach Anspruch 8, **dadurch gekennzeichnet, dass** die Walkbehandlung mit Hilfe von nassen enzymatischen Detergenzien vorgenommen wird.

**Revendications**

**1.** Procédé de fabrication d'un article textile en pur cachemire de haut titre **caractérisé en ce qu'**il comprend la suite d'étapes suivante :

(a) doublage d'un premier fil (1) de pur cachemire de haut titre ayant un titre compris entre 85 dtex et 200 dtex avec un second fil (2) de fibres synthétiques pouvant être dissoutes dans une solution liquide légèrement acide à haute température, l'opération de doublage étant réalisée dans un sens opposé à celui du fil individuel, c'est-à-dire avec torsion S ;
(b) tissage des fils doublés (1,2) ;
(c) dissolution desdits seconds fils (2) au moyen d'une solution liquide légèrement acide ayant un pH de 4 - 4,5 et une température de 85 - 95°C.

**2.** Procédé selon la revendication 1, **caractérisé en ce que** le fil (1) de pur cachemire a un titre de 130 dtex,

**3.** Procédé selon la revendication 1, **caractérisé en ce que** le fil (2) de fibres synthétiques a une finesse de balle de 2,2 ± 0,3 dtex, une longueur de coupe rectangulaire de 38 et 51 mm, une longueur de coupe oblique de 85 mm (CV 35%), une résistance mécanique de 8,5 ± 1,5 cN/dtex et un allongement de 11 ± 4 %.

**4.** Procédé selon la revendication 1, **caractérisé en ce que** le fil (2) de fibres synthétiques a une finesse de balle de 2,2 ± 0,3 dtex, une coupe diagonale de 85 ± 30 mm et une masse de 20 g/m.

**5.** Procédé selon la revendication 3, **caractérisé en ce que** le fil (2) de fibres synthétiques a une température de solubilité dans l'eau de 80 ± 10 °C en tant que fil en soi et de 90 ± 10 °C en tant que fil mélangé à une étoffe.

**6.** Procédé selon la revendication 3, **caractérisé en ce que** le fil (2) de fibres synthétiques a une température de vaporisation de 90 °C max. pour des tubes en carton et de 80 °C max. pour des tubes en matière plastique.

**7.** Procédé selon la revendication 3, **caractérisé en ce qu'**il utilise pour la dissolution une température de l'eau de 85 - 95 °C pour l'opération de trempage (pendant environ 30 min), et de 40°C pour l'opération de rinçage (pendant environ 10 min), un rapport eau/étoffe de 50/1 en masse et un pH de 4 - 4,5 comme acidité de l'eau.

**8.** Procédé selon la revendication 1, **caractérisé en ce** la dissolution est précédée par des procédés de trempage, de teinture et de foulage de l'étoffe.

**9.** Procédé selon la revendication 8, **caractérisé en ce que** le trempage de l'étoffe est réalisé dans un bain neutre.

**10.** Procédé selon la revendication 8, **caractérisé en ce que** la teinture est réalisée au moyen de colorants

acides.

**11.** Procédé selon la revendication 8, **caractérisé en ce que** le foulage est réalisé au moyen de détergents enzymatiques humides.


FIG.1

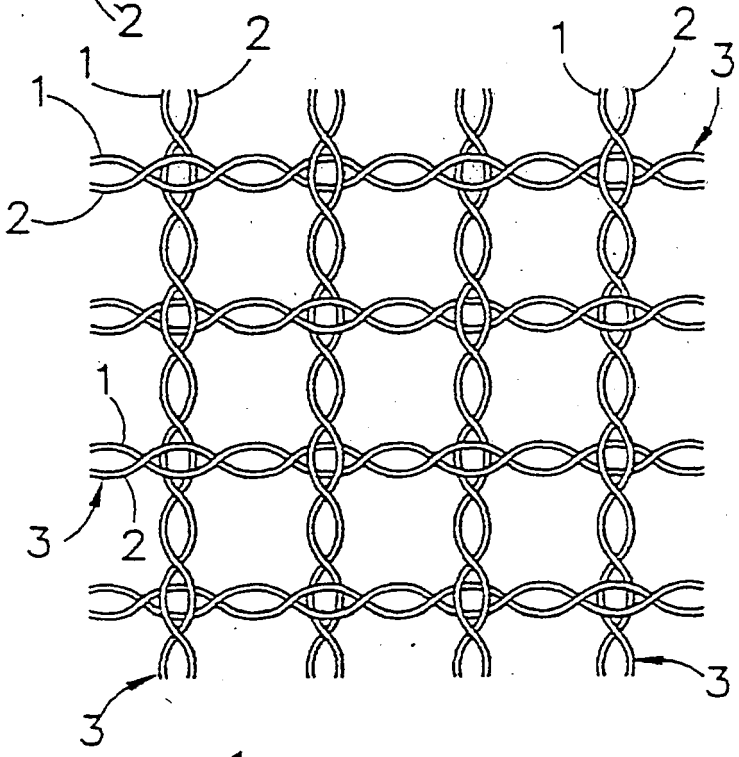


FIG.2

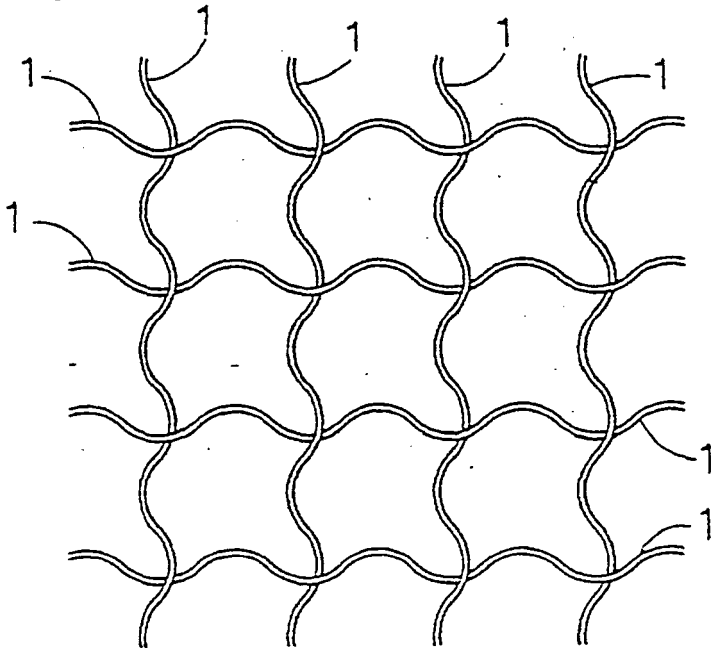


FIG.3

## REFERENCES CITED IN THE DESCRIPTION

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