

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 0 452 607 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
17.01.1996 Bulletin 1996/03

(51) Int Cl.⁶: **D04B 21/04**

(21) Application number: **90830311.8**

(22) Date of filing: **06.07.1990**

(54) **Method for making a skin effect elastic fabric**

Verfahren zur Herstellung eines einen Oberflächeneffekt aufweisenden elastischen Gestrickes

Procédé pour la fabrication d'un article tricoté élastique présentant un effet de surface

(84) Designated Contracting States:
AT BE CH DE DK ES FR GB GR LI LU NL SE

(30) Priority: **19.04.1990 IT 2006990**

(43) Date of publication of application:
23.10.1991 Bulletin 1991/43

(73) Proprietor: **EUROJERSEY S.P.A.**
I-21042 Caronno Pertusella (Varese) (IT)

(72) Inventor: **Crespi, Giorgio, c/o Eurojersey S.p.A.**
I-21042- Caronno Pertusella (IT)

(74) Representative: **Lunati, Vittoriano**
I-20129 Milano (IT)

(56) References cited:
EP-A- 0 295 703 DD-A- 128 498
DE-A- 3 213 581

Remarks:

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

EP 0 452 607 B1

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description**BACKGROUND OF THE INVENTION**

5 The present invention relates to a method for making skin-effect elastic pile fabrics as known, for instance, from DE-A-3 213 581. According to this known method elastomeric yarn and not elastic yarn are knitted in an opposite notation such that the yarns cross each other.

As is known, pile knitted fabrics are usually made by raising operations, followed by a shearing operation of the raised yarns, or, alternatively, by grinding or lapping operations.

10 This making method, on the other hand, presents the drawback that only a given portion of the pile forming yarns is sheared and, accordingly, the formed fabric will contain pile yarns of an essentially discontinuous nature.

SUMMARY OF THE INVENTION

15 Accordingly, the aim of the present invention is to overcome the above mentioned drawback, by providing a method for making skin effect elastic fabrics allowing very even pile fabric to be easily produced.

Within the scope of the above mentioned aim, a main object of the present invention is to provide such a skin-effect fabric making method which can be easily carried out on conventional systems and machines.

Another object of the present invention is to provide such a fabric making method which allows an improved new
20 type of fabric to be produced at a comparatively low cost.

According to the present invention, the above mentioned aim and objects, as well as yet other objects, which will become more apparent hereinafter, are achieved by a method according to claim 1.

BRIEF DESCRIPTION OF THE DRAWINGS

25 Further characteristics and advantages of the method according to the present invention will become more apparent from the following detailed description of a preferred, though not exclusive, embodiment of said method, with reference to the accompanying drawing where:

Figure 1 shows the full binding of the warp knitted fabric made by the subject method.

DESCRIPTION OF THE PREFERRED EMBODIMENT

35 More specifically, the subject method provides for making, on a conventional knitting machine for making non-run fabrics, a resilient fabric having a first not-elastomeric fibrous component, a second elastomeric fibrous component and, optionally, at least a third not elastomeric fibrous component.

In particular, at least a portion of the mentioned first fibrous component is introduced into the fabric by a long loose portion so as to cause the second elastomeric component to be contracted as the fabric is raised and sheared.

Accordingly, the long loose portions of the first not elastomeric component are forced so as to be advantageously arranged with an arrangement suitable for raising and shearing, or grinding, to provide a skin-effect pile fabric.

40 In this connection it should be pointed out that the term "long loose portion" or long "float" is used, with respect to a warp knitted fabric, to indicate that the first fibrous component is knitted into the fabric with at least a 1-0 - 2-3 notation on a non-run fabric knitting machine.

In particular, the subject method can be carried out on a conventional warp knitting machine having conventional latch needles or composite spring needles.

45 Moreover, while it has been stated that the first not elastomeric fibrous component is knitted into the fabric by a long loose portion, it should be apparent that other components including long loose portions can be also knitted into the fabric by using suitable needle bars.

It should be moreover pointed out that, while the subject method is particularly suitable for making a simple-warp knitted fabric, more complex fabrics can also be made by conventional warp knitting devices, with partial threading patterns or with full warp patterns obtained by operating all of the bars of the knitting machine.

50 In this connection it should be furthermore pointed out that lighter fabrics, having a thinned out pile arrangement and an even aspect can also be produced by an even partial threading of the bar used for forming the pile; for example an alternate repeat of the pile bar would provide a pile having a half density.

Typically, however, an elastomeric yarn 1 is knitted by fully threading it on the front bar, while a not elastomeric yarn
55 2 is fully threaded on the rear bar so as to provide long loose portions or floats on the surface of the reverse portion of the fabric.

For a typical fabric, made on a knitting machine with a fineness of 28-32-36 needles/inch, the elastomeric yarn will be knitted according to a 1-0/1-2 notation on the front bar, whereas the yarn on the rear bar will be knitted according to

a 1-0/ 3-4 notation, or according to a notation from 1-0/2-3 to 1-0/9-10.

Thus, the first fibrous component will be knitted into the fabric with a long loose portion or float.

However, different lengths and bar notations can be used, in order to modify the fabric texture, in order to provide a decorative or functional effect.

In this connection it should be moreover pointed out that the fabric can be dyed and finished by conventional methods used for making resilient finished fabrics.

Advantageously, the yarns of the first component in the knitted fabric are raised and sheared, or simply ground, in a conventional manner, so as to provide a skin-effect pile fabric.

The raising and shearing, or griding, steps can be carried out at any suitable time in the method, for example immediately after the knitting or after a steam processing or after the dyeing.

For making the fabric several fibrous components can also be used.

In particular, while the second elastomeric component can comprise a natural material, it will usually comprise a synthetic elastomeric yarn, preferably of the bare type.

A suitable yarn or filament decitex can be selected in the range from 10 to 200, but it is preferable that the resilient yarn has a decitex value from 22 to 56.

The first not elastomeric component of the fabric, that is the yarn provided for forming the skin-effect pile, in turn, can be either a natural or a synthetic yarn and, typically, it will have a decitex count from 22 to 100.

In this connection it should be moreover pointed out that while the provision of an elastomeric component is essential for making the subject fabric, it would be also possible that the end use provided for the fabric does not require that the latter has resilient or elastic characteristics.

In this case, the elastic characteristics of the second component can be reduced or removed during the processing of the fabric, for example by a high pressure dyeing or a hot thermosetting.

The knitted fabric made by the subject method can be substantially used for a lot of end uses, in particular for making bath costumes, garments in general, motor vehicle inner finishing fabrics and so on.

By way of an example, the subject method will be disclosed hereinafter as carried out on a conventional Mayer warp knitting machine.

This machine, having slide needles, with a fineness of 32, and two bars, is loaded with 4000 yarns for bars, with an elastomeric filament yarn of 44 dtx (e.g. Lycra, of the Du Pont de Nemours), on the front bar, and with a glossy circular Nylon 6 yarn, of a 36 filament type, on the rear bar.

Said knitting machine is set according to the following conditions:

- Rear bar:

- . notation 1-0/3-4;
- . supplied length mm/Rack 2000;

- front bar:

- . notation 1-0/1-2;
- . supplied length mm/Rack 600;
- . loops per centimeters 28.

More specifically:

- The supplied length are indicated in mm/Rack. The elastomeric filament yarn length supplied to the front bar is indicated in the released condition;
- The loops per centimeter are defined at the sinker by conventional adjustments of the machines.

Moreover, with respect to the head, the following data is provided:

- . type of machine Copcentra 4;
- . repeat length 2 loops;
- . repeat height 1 needle;
- . fineness 32 needles/25,4 mm (inch);
- . loops 28 loops/cm (71,12 loops/25,4 mm (inch);
- . working height 4032 needles (126,00 inches);
- . height of the machine 135 inches;
- . repeat amount 1.

With respect to the threading, the following data is provided:

- . height of the machine 4320 needles;
- . working height 4032 needles;
- 5 . repeat height 1 needle;
- . repeat amount 1;
- . left selvedge 144 needles;
- . right selvedge 144 needles;
- 10 . yarn guide 0;

with the additional table

Pet.	Offs.	Threading	WITH
L 1-0	0	6*, 4020a, 7* empty needles sx 151; empty needles dx 150 +	
L 2-0	0	6*, 4020b, 7* empty needles sx 151; empty needles dx 150 +	

where at "L1" there is indicated the rear bar and at "L2" there being indicated the front bar.

The yarn "a", on L1 comprises a 44/36 mmRK 2000 polyamide; the yarn "b" on L2 comprises a 44/1 mmRK 600 elastomer.

In this connection it should be pointed out that, after having removed the formed fabric from the knitting machine, the elastomeric yarn is contracted, so as to cause a corresponding contraction of the not elastomeric component knitted on the rear bar so as to arrange it to be subjected to four passages on a raising machine and a passage on a shearing machine, or, alternatively, to one or two passages on a grinding machine, so as to provide a skin effect pile.

Then, the fabric pieces have been washed in a continuous washing machine and then thermoset in a "rameuse" at 190°C so as to provide a fabric ready for the dyeing.

The fabric pieces have been successively dyed at 95°C in a soft-flow yet dyeing apparatus by using auxiliary chemical dyeing products as conventionally used for synthetic elastic fabrics.

The thus made dyed fabric has been dried at 140°C, with a width of 150 cm, the fabric having a weight of 200 grams by m² with a tolerance weight of $\pm 5\%$.

From the above disclosure it should be apparent that the subject method fully achieves the intended aim and objects.

While the invention has been disclosed and illustrated with reference to a preferred embodiment thereof, it should be apparent that the disclosed embodiment is susceptible to several modifications and variations within the scope of the appended claims.

Claims

1. A method for making skin effect elastic fabrics including a first not elastomeric fibrous component (2), a second elastomeric fibrous component (1) and, optionally, at least a third not elastomeric fibrous component, on a warp knitting machine including at least a front knitting bar and a rear knitting bar, said method comprising the step of introducing at least a portion of said first not elastomeric fibrous component into the fabric with a long loose portion so that, as said fabric is removed from said knitting machine, the elasticity of said second elastomeric fibrous component causes the latter to be contracted thereby the long loose portions of the first not elastomeric component are forced to dispose in a suitable arrangement to be raised, sheared or ground to provide a skin effect elastic fabric,
 - characterized in that said elastomeric fibrous component is fitted on said front knitting bar and is knitted thereon with a notation of 1-0/1-2,
 - and in that said not elastomeric fibrous component is fitted on said rear knitting bar and is knitted thereon with a notation from 1-0/2-3 to 1-0/9-10,
2. A method according to Claim 1, characterized in that after the removal of said fabric from said knitting machine said not elastomeric fibrous component is subjected to four raising passes on a raising machine and to a shearing pass on a shearing machine.

3. A method according to claims 1 and 2, characterized in that after the removal of said fabric from said knitting machine said not elastomeric fibrous component is subjected to two grinding passes on a grinding machine.
- 5 4. A method according to one or more of the preceding claims characterized in that said method further comprises the step of washing said fabric in a continuous washing machine and thermosetting said washed fabric in a rameuse at 190°C so as to provide a fabric ready for dyeing.
- 10 5. A method according to one or more of the preceding claims, characterized in that said method comprises the further steps of dyeing said fabric at 95°C in a jet dyeing apparatus, and drying said fabric at 140°C.

Patentansprüche

- 15 1. Verfahren zur Herstellung eines einen Oberflächeneffekt aufweisenden elastischen Gestricks, umfassend ein erstes Nichtelastomer-Faserelement (2), ein zweites Elastomer-Faserelement (1) und wahlweise mindestens ein drittes Nichtelastomer-Faserelement, zur Anwendung bei einer mindestens einen vorderen Wirkstab und einen rückwärtigen Wirkstab aufweisende Ketten-Wirkmaschine, wobei das Verfahren einen Arbeitsgang vorsieht, in der mindestens ein Teil des ersten Nichtelastomer-Faserelementes in langer loser Form in das Gestrick eingebracht wird, so dass beim Auslösen des Gestrickes aus der Wirkmaschine durch die Elastizität des zweiten Elastomer-Faserelementes das erste Faserelement zusammengezogen wird, wobei sich die langen losen Bereiche des ersten Nichtelastomer-Faserelementes gezwungenermaßen so anordnen, dass sie zur Herstellung eines einen Oberflächeneffekt aufweisenden elastischen Gestrickes aufgeraut, geschoren oder abgeschliffen werden können,
 - 20 - dadurch gekennzeichnet, dass das Elastomer-Faserelement auf dem vorderen Wirkstab angeordnet ist, auf dem es mit einer Notation von 1-0, 1-2 verwoben wird,
 - 25 - und dass das Nichtelastomer-Faserelement auf dem rückwärtigen Wirkstab angeordnet ist, auf dem es mit einer Notation von 1-0/2-3 bis 1-0/9-10 verwoben wird.
- 30 2. Verfahren nach Anspruch 1, dadurch gekennzeichnet, dass nach Auslösen des Gestrickes aus der Wirkmaschine das Nichtelastomer-Faserelement in einer Aufrauhmaschine vier Aufrauhvorgängen sowie einem Schärvorgang in einer Schärmaschine unterzogen wird.
- 35 3. Verfahren nach den Ansprüchen 1 und 2, dadurch gekennzeichnet, dass nach Auslösen des Gestrickes aus der Wirkmaschine das Nichtelastomer-Faserelement in einer Schleifmaschine zwei Schleifvorgängen unterzogen wird.
- 40 4. Verfahren nach einem oder mehreren der vorstehenden Ansprüche, dadurch gekennzeichnet, dass das Verfahren ferner das Waschen des Gestrickes in einer Durchlauf-Waschmaschine sowie das Wärmehärten des Gestricks in einem Spannrahmen bei 190°C umfasst, um ein für das Färben fertige Gestrick zur Verfügung zu stellen.
5. Verfahren nach einem oder mehreren der vorstehenden Ansprüche, dadurch gekennzeichnet, dass das Verfahren das Färben des Gestrickes bei 95°C in einer Jet-Färbemaschine und das Trocknen des Gestrickes bei 140°C umfasst.

Revendications

- 50 1. Procédé pour la fabrication d'articles tricotés élastiques présentant un effet de surface comprenant un premier composant fibreux non élastomère (2), un deuxième composant fibreux en élastomère (1) et éventuellement au moins un troisième composant fibreux non élastomère sur un métier à tricoter chaîne comprenant au moins une barre avant de tricotage et une barre arrière de tricotage, ledit procédé comprenant l'étape d'introduire au moins une portion dudit premier composant fibreux non élastomère dans le tissu avec une longue portion lâche de sorte que, quand ledit tissu est enlevé dudit métier à tricoter, l'élasticité dudit deuxième composant fibreux en élastomère amène ce dernier à se contracter et par conséquent les longues portions lâches du premier composant non élastomère sont poussées à se disposer selon un arrangement convenable leur permettant d'être lainées, tondues ou ébarbées, de manière à fournir un article tricoté élastique présentant un effet de surface,
 - 55 - caractérisé en ce que le composant fibreux en élastomère est adapté sur ladite barre avant de tricotage et est tricoté sur cette dernière avec une notation de 1-0/1-2,

EP 0 452 607 B1

- et en ce que ledit composant fibreux non élastomère est adapté sur ladite barre arrière de tricotage et est tricoté sur cette dernière avec une notation de 1-0/2-3 à 1-0/9-10.

5 2. Procédé selon la revendication 1, caractérisé en ce qu'après l'enlèvement dudit tissu dudit métier à tricoter, ledit composant fibreux non élastomère est soumis à quatre passages de lainage sur une laineuse et a un passage de tondage sur une tondeuse.

10 3. Procédé selon les revendications 1 et 2, caractérisé en ce qu'après l'enlèvement dudit tissu de ladite machine à tricoter ledit composant fibreux non élastomère est soumis à deux passages d'ébarbage sur une machine à ébarber.

4. Procédé selon une ou plusieurs des revendications précédentes, caractérisé en ce que ledit procédé comporte en outre l'étape de laver ledit tissu dans une machine de lavage continu et thermodurcir ledit tissu lavé dans une rameuse à 190°C de manière à fournir un tissu prêt à être teint.

15 5. Procédé selon une ou plusieurs des revendications précédentes, caractérisé en ce que ledit procédé comporte en outre les étapes de teindre ledit tissu à 95°C dans un dispositif de coloration à jet, et de sécher ledit tissu à 140°C.

20

25

30

35

40

45

50

55

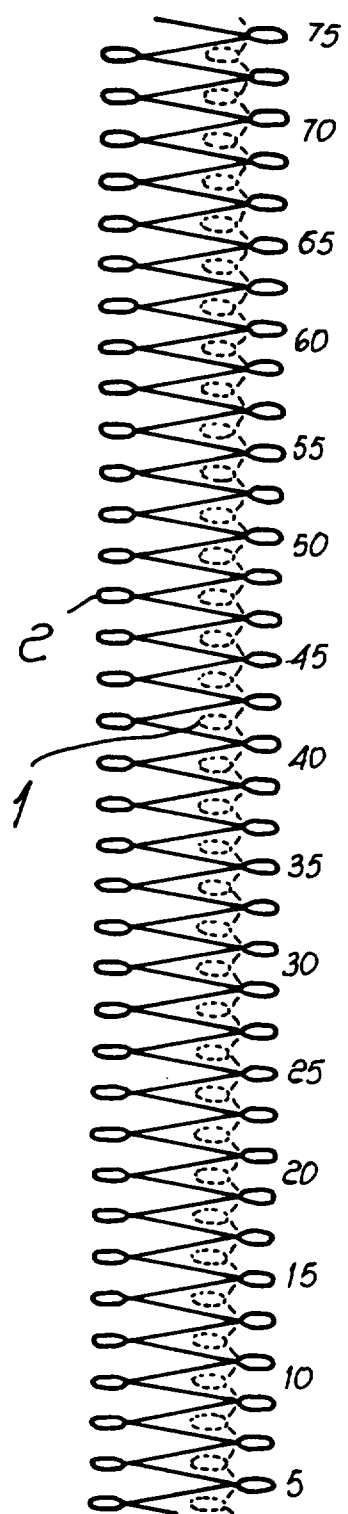


FIG. 1