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72 Inventor: **Crespi, Giorgio, c/o Eurojersey S.p.A.
 Via San Giovanni Bosco, 260
 I-21042- Caronno Pertusella(IT)**

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74 Representative: **Cicogna, Franco
 Ufficio Internazionale Brevetti Dott.Prof.
 Franco Cicogna Via Visconti di Modrone,
 14/A
 I-20122 Milano(IT)**

71 Applicant: **EUROJERSEY S.P.A.
 Via San Giovanni Bosco, 260
 I-21042 Caronno Pertusella (Varese)(IT)**

54 **Method for making a skin effect elastic fabric and the fabric made thereby.**

57 There is disclosed a method for making non-run knitted fabrics on a knitting machine.

The fabric comprises a first not elastomeric fibrous component, a second elastomeric fibrous component and, optionally, at least a third not elastomeric fibrous components.

The subject method is characterized in that at least a portion of the first fibrous component is knitted into the fabric with a loose portion.

Thus, as the fabric is raised and sheared, or simply ground, the second elastomeric component is contracted, thereby the loose portions of the first not elastomeric fibrous components are so arranged as to be easily raised and sheared, or simply ground, in order to provide a skin-effect pile fabric in which the first fibrous component is present in essentially discontinuous lengths.

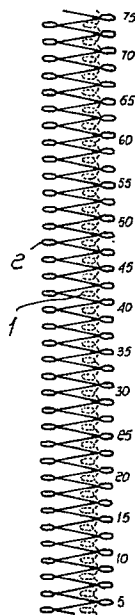


FIG. 1

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BACKGROUND OF THE INVENTION

The present invention relates to a method for making skin-effect elastic pile fabrics and the elastic fabrics made thereby.

5 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.

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.

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SUMMARY OF THE INVENTION

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.

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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 type of fabric to be produced at a comparatively low cost.

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According to one aspect of 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 for making skin-effect elastic fabrics, including a first not elastomeric fibrous component, a second elastomeric fibrous component and, optionally, at least a third not elastomeric fibrous component, on a knitting machine, characterized in that said method comprises the step of introducing at least a portion of the first fibrous component into the fabric with a long loose portion so as to cause the second elastomeric component to be contracted as said fabric is removed from said knitting machine, thereby the long loose portions of the first not elastomeric component are forced to be arranged in a suitable arrangement to be raised, sheared, or simply ground, to form a skin-effect pile fabric.

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30 BRIEF DESCRIPTION OF THE DRAWINGS

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:

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

DESCRIPTION OF THE PREFERRED EMBODIMENT

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.

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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.

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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.

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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.

On the other hand, with reference to a weft knitted fabric, the term "long loose portion" is used for indicating that, during the knitting work, the pile bar will jump at least three needles.

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

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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.

5 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 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.

10 For a typical fabric, made on a knitting machine with a thinness 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.

15 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.

20 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.

25 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.

30 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.

35 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.

40 This machine, having slide needles, with a thinness 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:

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- Rear bar:

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

- front bar:

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

More specifically:

- 20 - 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:

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

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

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

with the additional table

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

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 ± 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 all of which will come within the spirit and scope of the appended claims.

Claims

- 55 1. A method for making skin-effect elastic fabrics, including a first not elastomeric fibrous component, a second elastomeric fibrous component and, optionally, at least a third not elastomeric fibrous component, on a knitting machine, characterized in that said method comprises the step of introducing at least a portion of the first fibrous component into a fabric with a long loose portion so as to cause the second

elastomeric component to be contracted as said fabric is removed from said knitting machine, thereby the long loose portions of the first not elastomeric component are forced to be arranged in a suitable arrangement to be raised, sheared, or simply ground, to form a skin-effect pile fabric.

- 5 2. A method according to Claim 1, characterized in that at least a portion of said first fibrous component is knitted into the fabric with a long loose portion so that, as the fabric is removed from the knitting machine, the second elastomeric fibrous element is contracted to force all of the long loose portions of the first not elastomeric component to be arranged in an arrangement suitable to be raised, sheared or simply ground, to provide a skin effect pile fabric.
- 10 3. A method according to Claim 2, characterized in that said first fibrous component is knitted into the fabric with a notation from 1-0/2-3 to 1-0/9-10.
- 15 4. A method according to Claim 1, characterized in that said fabric, as removed from the knitting machine, is subjected to a raising and shearing processing, or simply to a grinding processing, in order to provide a skin effect pile fabric.
- 20 5. A method according to Claim 1, characterized in that said method comprises a subsequent step of raising and shearing, or grinding, to provide on the fabric a skin effect pile.
6. A method, according to claim 1, characterized in that said fabric, after raising, shearing or grinding, is subjected to a washing step and then to a thermosetting step and a dyeing and finishing step.
- 25 7. A knitted fabric made by a method according to Claim 1, characterized in that a portion of said fabric yarns is raised and sheared, or ground, with a discontinuous length.

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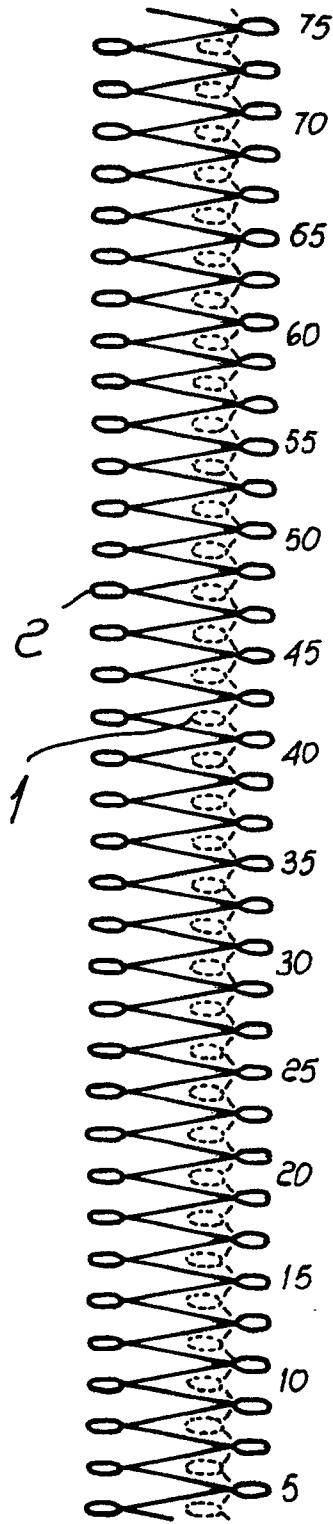


FIG. 1