US 20210002798A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2021/0002798 A1

SOSTER et al. (43) Pub. Date: Jan. 7, 2021

(54) METHOD FOR MANUFACTURING A STRETCH FABRIC COMPRISING PLANT FIBRES AND STRETCH FABRIC MANUFACTURED BY SUCH METHOD

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(21) Appl. No.: **16/977,001**

(22) PCT Filed: **Feb. 28, 2019**

(86) PCT No.: **PCT/IB2019/051608**

§ 371 (c)(1),
(2) Date: **Aug. 31, 2020**

(30) **Foreign Application Priority Data**

Mar. 1, 2018 (IT) 102018000003155

Publication Classification

(51) **Int. Cl.**

D03D 15/08	(2006.01)
D02G 3/32	(2006.01)
D03D 15/00	(2006.01)

(52) **U.S. Cl.**

CPC ***D03D 15/08*** (2013.01); ***D02G 3/32*** (2013.01); ***D03D 15/0027*** (2013.01); *D03D 2700/0103* (2013.01); *D10B 2201/04* (2013.01); *D10B 2331/10* (2013.01); *D10B 2211/04* (2013.01); *D10B 2321/06* (2013.01)

(57) **ABSTRACT**

A method includes the operating steps of providing a stretch twisted yarn including a plurality of single threads twisted together. A pair of mixed threads has substantially inextensible plant fibers mixed with water-soluble fibers, and an elastic single thread includes synthetic elastic fibers. The method further includes providing a further yarn, manufacturing a fabric through weaving by interlacing the twisted yarn with the further yarn, and dissolving the water-soluble fibers from the fabric.

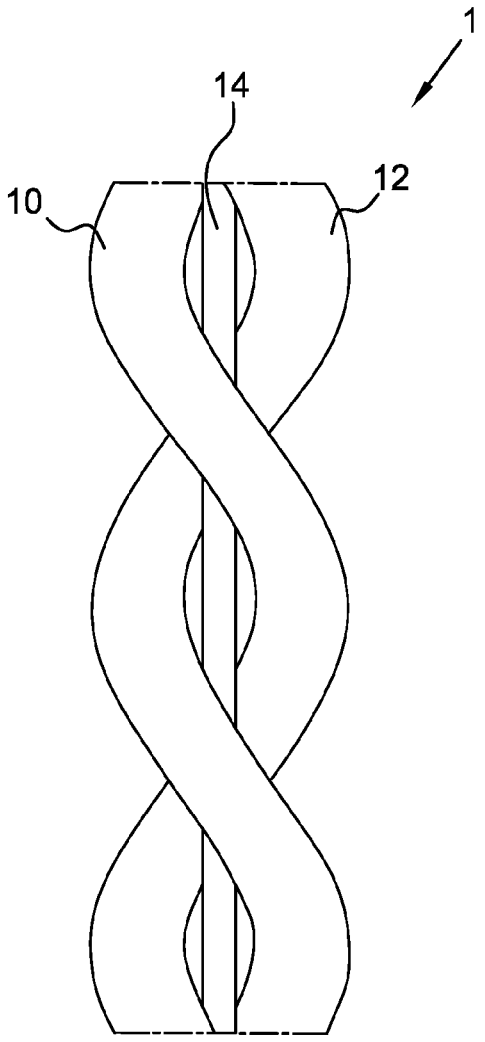


Fig. 1

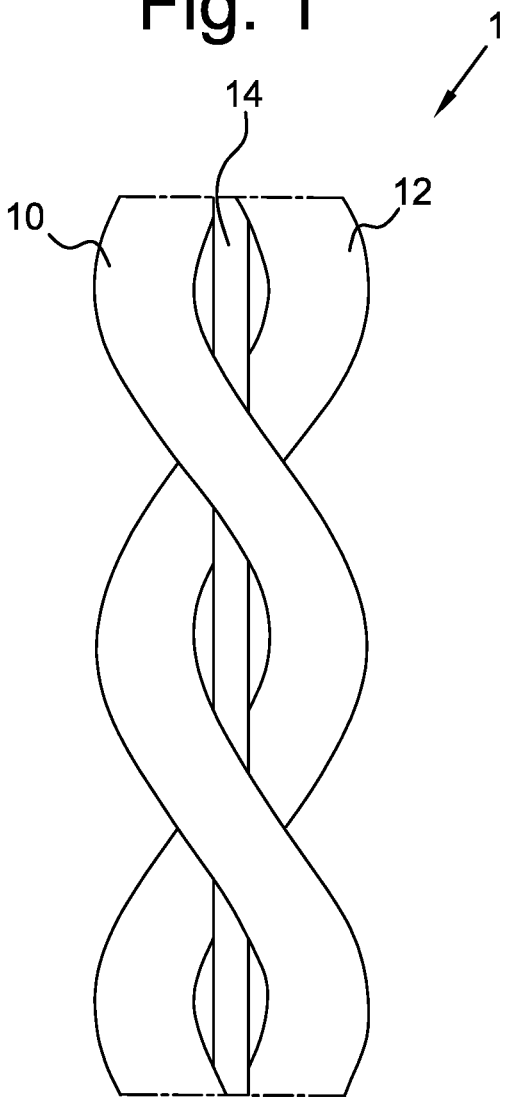
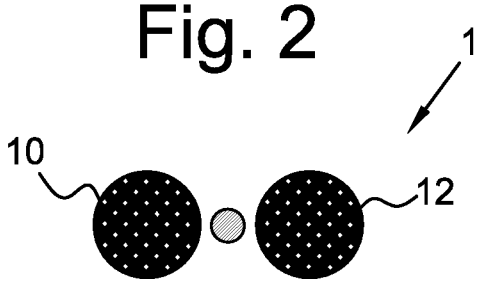


Fig. 2



METHOD FOR MANUFACTURING A STRETCH FABRIC COMPRISING PLANT FIBRES AND STRETCH FABRIC MANUFACTURED BY SUCH METHOD

TECHNICAL FIELD

[0001] The invention relates to a method for manufacturing a stretch fabric and to a fabric manufactured by means of such method.

TECHNOLOGICAL BACKGROUND

[0002] Plant fibers, especially bast fiber and, more in particular, linen fibers, are known to be particularly stiff and irregular, not very extensible and easily creased. However, their high thermal conductivity makes them particularly suitable for manufacturing summer items of clothing and this causes them to be counted among the finest natural fibers.

[0003] The state of the art currently causes the linen fabric to be become elastic through the twisting of the linen yarn with an elastic yarn, typically an elastomeric (for example, polyurethanic) yarn, changing the twisting coefficient from low to high or very high, which is what happen with extra-twisted yarns. Alternatively, this mechanism is supported by a further thermoshrinking yarn made of a synthetic fiber. This technique, however, does not allow manufacturers to obtain a good elastic recovery of the fabric manufactured with the above-mentioned yarn thus causing the formation of visible defects.

SUMMARY OF THE INVENTION

[0004] An object of the invention is to provide a method for manufacturing a stretch fabric and a stretch fabric manufactured by means of such method, wherein they are capable of solving the drawbacks of the prior art.

[0005] In particular, the invention is aimed at providing a method for manufacturing a stretch fabric which is comfortable and has a high degree of elasticity, solving, at the same time, the tendency to form typical defects due to the lack of elastic return.

[0006] According to the invention, this and other objects are reached by means of a method and a fabric having the technical features set forth in the appended independent claims.

[0007] The appended claims are an integral part of the technical teaches provided in the following detailed description concerning the invention. In particular, the appended dependent claims define some embodiments of the invention including preferred or optional technical features.

[0008] Further features and advantages of the invention will be best understood upon perusal of the following detailed description, which is provided by way of example and is not limiting, with reference, in particular, to the accompanying drawings, which are briefly described below:

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] FIG. **1** is a schematic view, in a longitudinal direction, of a stretch twisted yarn which can be used in a method implemented according to an explanatory embodiment of the invention.

[0010] FIG. **2** is a schematic, cross section view of the stretch twisted yarn shown in FIG. **1**.

DETAILED DESCRIPTION OF THE INVENTION

[0011] With reference, in particular and by way of example, to FIGS. **1** and **2**, the invention suggests a method for manufacturing a stretch yarn comprising the following operating steps:

[0012] providing a stretch twisted yarn (**1**) comprising a plurality of single threads twisted together and wherein there are:

[0013] a pair of mixed threads **10**, **12**, wherein the mixed threads comprise substantially inextensible plant fibers mixed with water-soluble fibers, and an elastic single thread **14**, wherein the elastic thread comprises synthetic elastic fibers;

[0014] providing a further yarn, for example a substantially inextensible yarn comprising substantially inextensible plant fibers;

[0015] manufacturing a fabric through weaving by interlacing a set of threads of said stretch twisted yarn **1** with a set of threads of said further yarn, for example threads of the aforesaid substantially inextensible yarn; and

[0016] dissolving the water-soluble fibers from the fabric.

[0017] Said further yarn does not necessarily need to be a substantially inextensible yarn. Alternatively, said further yarn can be stretch twisted yarn **1** itself. Therefore, in this hypothesis, the method creates a fabric weave, in which both the weft threads and the warp threads are made of the aforesaid stretch twisted yarn **1**.

[0018] Thanks to these features, the water-soluble fiber creates a sort of filling inside a "cage" formed by bundles natural fibers, thus allowing the yarn to resist weaving tensions. Once the natural fiber has dissolved, the yarn looses a percentage of weight amounting to the content of water-soluble fiber and the cavities formed due to the melting of the water-soluble fibers are then responsible for an elasticity that allows the natural fibers to be wound around the elastic yarn, without causing a narrowing.

[0019] Therefore, the aforesaid method reduces the tendency to the formation of defects in the fabric, maintaining the technical resistance and improving the elastic recovery capacity of the fabric.

[0020] For example, as far as the mixed yarn is concerned, the weight percentage of the water-soluble fibers advantageously, though not necessarily ranges from 20% to 70% of water-soluble fibers.

[0021] The method described above produces a natural fiber fabric with a reduced percentage of synthetic fiber (for example, a weight percentage substantially ranging from 1% to 5%), though capable of ensuring ideal elasticity and comfort. This happens without using further synthetic fibers, thus preserving the look and the features that are typical of natural fibers when touching them, as wells as the breathability and the fresh feeling when they are worn. Furthermore, the method generates a performing fabric, which fulfills high quality standards. Finally, the aforesaid method enables a dry spinning with traditional wool or cotton systems, which, compared to the traditional linen spinning system, permits a proper distribution of the fibers.

[0022] The plant fibers of the mixed yarn preferably are bast fibers. More preferably, the bast fibers comprise linen fibers.

[0023] In an explanatory embodiment of the invention, the water-soluble fibers comprise alginic fibers. In a further explanatory embodiment of the invention, the water-soluble fibers comprise synthetic fibers made of polyvinyl alcohol or PVA.

[0024] The substantially inextensible yarn preferably comprises plant fibers of the same type used for the mixed yarn.

[0025] The substantially inextensible yarn preferably comprises a single thread made of substantially inextensible plant fibers and a single thread made of animal fibers, said threads being twisted together. In particular, the substantially inextensible plant fibers are bast fibers and, in particular, linen fibers. In particular, the animal fibers comprise silk fibers. According to a variant, the substantially inextensible yarn can consist of substantially inextensible plant fibers, for example of pure bast fibers, in particular pure linen. According to this variant, the substantially inextensible yarn can comprise a pair of single threads made of pure bast fibers, in particular linen fibers, wherein said single threads are twisted together.

[0026] In the aforesaid method, the weaving is preferably carried out so that the set of weft threads comprises a plurality of threads of stretch twisted yarn **1** alternated with a plurality of threads of the substantially inextensible yarn.

[0027] In the aforesaid method, the weaving is preferably carried out so that the set of warp threads comprises a plurality of threads of the substantially inextensible yarn. In particular, the weaving is carried out so that the set of warp threads comprises a plurality of threads of stretch twisted yarn **1** alternated with the plurality of threads of substantially inextensible yarn.

[0028] Preferably, the water-soluble fibers are dissolved from the fabric by means of a bath in an alkaline solution.

[0029] Therefore, the resulting fabric can preferably be subjected to possible dyeing and finishing operations, depending on the look and the coat to be obtained, in particular after thermal fixing and drying for the stabilization of the elastic yarn.

[0030] Two explanatory embodiments of the invention will be described hereinafter.

[0031] In a first explanatory embodiment of the invention, the substantially inextensible yarn comprises a linen thread and a silk thread, which are twisted together. Furthermore, stretch twisted yarn **1** comprises a pair of mixed threads **10**, **12**, wherein there linen fibers mixed with polyvinyl alcohol or PVA fibers, and an elastic thread **14**, wherein there are polyurethanic fibers.

[0032] In this first embodiment, the set of warp threads consists of a plurality of threads of the substantially inextensible yarn (comprising the linen thread and the silk thread twisted together). Furthermore, the set of weft threads consists of a plurality of threads of the substantially inextensible yarn (comprising the linen thread and the silk thread twisted together) alternated with threads of stretch twisted yarn **1** (comprising the linen/polyvinyl alcohol mixed thread and the elastic thread of polyurethanic fibers).

[0033] In a second explanatory embodiment of the invention, the substantially inextensible yarn comprises a linen thread and a silk thread, which are twisted together. Furthermore, stretch twisted yarn **1** comprises a pair of mixed thread **10**, **12**, wherein there linen fibers mixed with polyvinyl alcohol or PVA fibers, and an elastic thread **14**, wherein there are polyurethanic fibers.

[0034] In this second embodiment, the set of warp threads consists of a plurality of threads of the substantially inextensible yarn (comprising the linen thread and the silk thread twisted together) alternated with threads of stretch twisted yarn **1** (comprising the pair of linen/polyvinyl alcohol mixed yarn threads **10**, **12** and elastic thread **14** of polyurethanic fibers). Similarly, the set of weft threads consists of a plurality of threads of the substantially inextensible yarn (comprising the linen thread and the silk thread twisted together) alternated with threads of stretch twisted yarn **1** (comprising the pair of linen/polyvinyl alcohol mixed yarn threads **10**, **12** and elastic thread **14** of polyurethanic fibers).

[0035] Alternatively, both in the first explanatory embodiment and in the second explanatory embodiment, the substantially inextensible yarn described therein (comprising the linen thread and the silk thread twisted together) can be replaced with a substantially inextensible yarn obtained with sole linen fibers, for example comprising two linen threads twisted together.

[0036] Naturally, the principle of the invention being set forth, embodiments and implementation details can be widely changed relative to what described above and shown in the drawings as a mere way of non-limiting example, without in this way going beyond the scope of protection provided by the accompanying claims.

[0037] For example, according to the invention, the weaves that can be used to obtain the fabric according to the invention are different and it is also possible to manufacture a Jacquard apparel fabric and knitted fabrics according to the known techniques of the prior art.

[0038] For example, according to the invention, an orthogonal fabric or a knitted fabric can be manufactured.

1. Method for manufacturing a stretch fabric comprising the following operating steps:

providing a stretch twisted yarn comprising a plurality of single threads twisted together and wherein the plurality of single threads comprises:

a pair of mixed threads, said mixed threads comprising substantially inextensible plant fibers mixed with water-soluble fibers, and

an elastic single thread, said elastic thread comprising synthetic elastic fibers;

providing a further yarn;

manufacturing a fabric through weaving by interlacing a set of threads of said stretch twisted yarn with a set of threads of said further yarn; and

dissolving said water-soluble fibers from said fabric.

2. The method according to claim **1**, wherein said further yarn is said stretch twisted yarn.

3. The method according to claim **1**, wherein said further yarn is a substantially inextensible yarn comprising substantially inextensible plant fibers.

4. The method according to claim **3**, wherein said plant fibers of said mixed yarn are bast fibers.

5. The method according to claim **4**, wherein said bast fibers comprise linen fibers.

6. The method according to claim **1**, wherein said water-soluble fibers comprise alginic fibers.

7. The method according to claim **1**, wherein said water-soluble fibers comprise synthetic fibers made of polyvinyl alcohol or polyvinyl acetate.

8. The method according to claim **1**, wherein said synthetic elastic fibers comprise polyurethanic fibers.

9. The method according to claim **3**, wherein said substantially inextensible yarn comprises plant fibers of the same type used for said mixed yarn.

10. The method according to claim **3**, wherein said plant fibers of said substantially inextensible yarn are bast fibers.

11. The method according to claim **10**, wherein said bast fibers comprise linen fibers.

12. The method according to claim **3**, wherein said substantially inextensible yarn comprises a first single thread made of substantially inextensible plant fibers and a second single thread made of animal fibers, said threads being twisted together.

13. The method according to claim **12**, wherein said plant fibers of said first thread comprise bast fibers.

14. The method according to claim **13**, wherein said bast fibers comprise linen fibers.

15. The method according to claim **12**, wherein said animal fibers of said second thread comprise silk fibers.

16. The method according to claim **3**, wherein said substantially inextensible yarn comprises a pair of single threads made of substantially inextensible plant fibers twisted together.

17. The method according to claim **3**, wherein said weaving is carried out so that a set of weft threads comprises a plurality of threads of said stretch twisted yarn alternated with a plurality of threads of said substantially inextensible yarn.

18. The method according to claim **17**, wherein said weaving is carried out so that a set of warp threads comprises a plurality of threads of said substantially inextensible yarn.

19. The method according to claim **18**, wherein said weaving is carried out so that a set of warp threads comprises a plurality of threads of stretch twisted yarn alternated with said plurality of threads of substantially inextensible yarn.

20. The method according to claim **1**, wherein said weaving is carried out so that a set of weft threads comprises a plurality of threads of said stretch twisted yarn and a set of warp threads comprises a plurality of threads of the stretch twisted yarn.

21. The method according to claim **1**, wherein said water-soluble fibers are dissolved from said fabric by a bath in an alkaline solution.

22. A stretch fabric obtained by a method according to claim **1**.

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