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(54) **BASE FABRIC FOR SLIDE FASTENER**

GRUNDGEWEBE FÜR REISSVERSCHLUSS

TISSU DE BASE POUR FERMETURE À GLISSIÈRE

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(56) References cited:
EP-A1- 1 254 980
US-A- 2 236 033
US-A- 2 400 924

- **JOSHI H D ET AL: "Dyeing and finishing of lyocell union fabrics: an industrial study", COLORATION TECHNOLOGY, WILEY, vol. 126, no. 4 1 August 2010 (2010-08-01), pages 194-200, XP001571811, ISSN: 1472-3581, DOI: 10.1111/J.1478-4408.2010.00248.X [retrieved on 2010-07-02]**

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Description

BACKGROUND OF THE INVENTION

1. TECHNICAL FIELD

[0001] The present invention relates to a method of producing a cellulose fiber product containing a slide fastener which is dyed simultaneously with any cellulose fiber product, that is, it is possible to dye any cellulose fiber product attached with the base fabric for a slide fastener, and has a better strength than a cotton material.

2. BACKGROUND

[0002] Examples of a method for producing a fiber product such as a cellulose fiber product include the following methods (I) and (II):

(I) a method of processing a yarn or fabric dyed beforehand in a predetermined color; and
(II) a method of forming an unbleached and undyed yarn or fabric, or a white yarn or fabric into a predetermined product, and then subjecting the product to dyeing process (the so-called piece dyeing).

[0003] According to, in particular, the piece dyeing in the item (II), the product is can be dyed in various colors. Thus, the method (II) has many advantages. For example, it is unnecessary to prepare stocks different in color, and products can be appropriately and timely dyed in accordance with a color in fashion or sales situation. Consequently, in recent years, the method (II) has been generally performed.

[0004] Cellulose fiber products include many products to each of which a slide fastener is attached. The slide fastener has a structure in which elements are attached to a base fabric. This base fabric is attached to a fiber product so that the fiber product having the slide fastener is obtained. As described in, for example, Japanese Unexamined Patent Publications Nos.H07-246107 and 2001-204515, a base fabric for a slide fastener is formed of a polyester fiber such as an easily dyeable polyester or polytrimethylene terephthalate fiber.

[0005] However, a polyester fiber as described in Japanese Unexamined Patent Publications Nos.H07-246107 and 2001-204515 is dyed with disperse dyes. Thus, when piece dyeing is performed using a fiber to be dyed with a dye other than disperse dyes, there is caused, for example, a problem that only a region of a base fabric for a slide fastener of the product remains undyed, or only the base fabric region has a different color. Although, for example, products formed of cotton are dyed with a reactive dye, a polyester fiber as described in Japanese Unexamined Patent Publications Nos.H07-246107 and 2001-204515 cannot be dyed with any reactive dye. Accordingly, there remains a problem that in accordance with the color of a product, the color of its base fabric is not variable since the base fabric is beforehand dyed in a predetermined color.

[0006] It is conceivable to produce a base fabric for a slide fastener from the same fiber as used for a product. However, any slide fastener is required to be strong since a high strength is applied thereto when the fastener is used. In particular, when the slide fastener is done up, the weft of its base fabric (i.e., yarns in a direction orthogonal to the sliding direction of the slide fastener) is pulled and get into a state where a high strength is applied to the weft. It is also conceivable to use a base fabric obtained by weaving a cotton yarn for a cotton product. However, the base fabric may be broken by a high strength while a product with the base fabric is undergoing distressing or washing.

SUMMARY

[0007] An object of the present invention is to provide a method of producing a cellulose fiber product containing a base fabric with a slide fastener which is dyed simultaneously with any cellulose fiber product and has a better strength than a cotton material.

[0008] In order to solve the above-mentioned problems, the inventors have made eager investigations to find out a solution having a structure described below, and then achieved the present invention. The method of the invention is defined in claim 1.

[0009] A slide fastener includes the above-mentioned base fabric with a slide fastener. A cellulose fiber product includes this slide fastener.

BRIEF DESCRIPTION OF THE DRAWING

[0010] Fig. 1 is a schematic view illustrating a slide fastener having a base fabric for a slide fastener as defined in one embodiment of the present invention.

DETAILED DESCRIPTION

[0011] With reference to Fig. 1, a description will be made about a base fabric for a slide fastener as described in the present invention and a slide fastener. The base fabrics for a slide fastener, which are base fabrics 1, are each formed of a woven fabric containing, at least in a weft thereof, a modified cellulose fiber having a dry strength of 30 cN/tex or more, and a wet strength of 24 cN/tex or more. In the present specification, the wording "weft" means yarns in a direction (i.e., direction Y in Fig. 1) orthogonal to a sliding direction (i.e., direction X in Fig. 1) of a slide fastener A in the woven fabric making up as the base fabric 1.

[0012] The modified cellulose fiber used in the one embodiment of the present invention is a fiber having a dry strength of 30 cN/tex or more and a wet strength of 24 cN/tex or more. Specifically, the modified cellulose fiber is a fiber obtained by modifying a cellulose fiber to have a dry strength of 30 cN/tex or more and a wet strength of 24 cN/tex or more. In the one embodiment of the invention, the modified cellulose fiber is preferably a modified cellulose fiber having a dry strength of 34 cN/tex or more and a wet strength of 26 cN/tex or more. The upper limit of the dry strength is usually about 46 cN/tex. The upper limit of the wet strength is also about 46 cN/tex. However, no problem is caused even when a modified cellulose fiber having a strength more than these upper limits is used.

[0013] Examples of the modified cellulose fiber having a dry strength of 30 cN/tex or more and a wet strength of 24 cN/tex or more include lyocell and polynosic rayon. Among these fibers, lyocell is preferred. Fibers are classified into short fibers and long fibers (filaments); in the embodiment of the present invention, either of the fibers may be used.

[0014] The base fabrics 1 for a slide fastener according to the one embodiment of the present invention are each formed of a woven fabric containing, in the weft, such a modified cellulose fiber in a proportion of 25% by mass or more. If the proportion of the modified cellulose fiber is less than 25% by mass, the resultant base fabric for a slide fastener does not have a sufficient strength. The modified cellulose fiber is contained at least in the weft preferably in a proportion of 40% by mass or more, more preferably in a proportion of 100% by mass. The modified cellulose fiber may be contained in both of the weft and the warp.

[0015] As far as the base fabrics 1 for a slide fastener according to the one embodiment of the present invention comprise a woven fabric, each containing, in the weft, the modified cellulose fiber in a proportion of 25% by mass or more, the weft comprises a union yarn or twisted union yarn formed of lyocell and a cellulose fiber other than lyocell. The fiber other than the modified cellulose fiber may be, for example, any cellulose fiber.

[0016] The cellulose fiber is a generic term of fibers formed mainly of cellulose, and is classified into natural fibers and chemical fibers (such as regenerated fibers and semi-synthetic fibers) . Examples of the cellulose fiber include cotton, Modal, rayon, and hemp. The base fabrics 1 may each contain any fiber other than the cellulose fiber as far as the amount of the other fiber is such an amount that does not affect simultaneous dyeing of the base fabric and the cellulose fiber product (single-bath dyeing) . Examples of the other fiber include polyester, nylon, and acrylic fibers. The weft used in the one embodiment of the present invention usually has a fineness of about 120 to 1000 dtex.

[0017] In the specification, the "union yarn" means a yarn obtained by mixing the modified cellulose fiber with a fiber other than the modified cellulose fiber, and then spinning the mixture. In the specification, the "twisted union yarn" means a twisted yarn as described in any one of the following (a) to (d) :

(a) any twisted yarn obtained by twisting a spun yarn of the modified cellulose fiber and a spun yarn of a fiber other than the modified cellulose fiber;
(b) any twisted yarn obtained by twisting a filament of the modified cellulose fiber and a filament of a fiber other than the modified cellulose fiber;
(c) any twisted yarn obtained by twisting a spun yarn of the modified cellulose fiber and a filament of a fiber other than the modified cellulose fiber; and
(d) any twisted yarn obtained by twisting a filament of the modified cellulose fiber and a spun yarn of a fiber other than the modified cellulose fiber.

[0018] The woven fabric may be obtained by subjecting any spun yarn or filament of the modified cellulose fiber, and any spun yarn or filament of a fiber other than the modified cellulose fiber, without being twisted, to parallel weaving or mixed weaving.

[0019] In the one embodiment of the present invention, the warp making up the woven fabric is not particularly limited, and may be the same yarn as used as the weft, or a yarn formed of a cellulose fiber, such as cotton. Considering the color of the woven fabric when the woven fabric is dyed, and a matter that the woven fabric is made small in strength difference between the warp direction and the weft direction, it is preferred to use the same yarn for the warp and the weft. Usually, the warp also has a fineness of about 120 to 1000 dtex.

[0020] Examples of the weave structure of the woven fabric which forms each of the base fabric 1 for a slide fastener include herringbone weave, plain weave, twill weave, and sateen weave. Among these structures, herringbone weave is preferred. The base fabric 1 for a slide fastener according to the one embodiment of the present invention, for example,

the size (width) thereof in the weft direction is from about 5 to 25 mm, and the size (length) in the warp direction is from about 40 to 600 mm. It is advisable to set these sizes appropriately in accordance with the size of the slide fastener A.

[0021] The thus obtained base fabrics 1 for a slide fastener according to the one embodiment of the present invention are used instead of base fabrics that have been hitherto used for a slide fastener. This matter is specifically as follows. The paired base fabrics 1 for a slide fastener according to the one embodiment of the invention are prepared. Elements 2 are fixed to a side of each of the base fabrics 1, the side being along the longitudinal direction of the base fabric 1 (sliding direction) . The sides of the base fabrics 1 to each of which the elements 2 are fixed are caused to face each other. Next, a slider 3 is attached to the base fabrics 1 to engage the elements 2 with each other or separate the elements 2 from each other. In this way, the slide fastener A is obtained. The slide fastener A may be a metallic fastener in which the elements 2 are formed of a metal, or may be a resin fastener in which the elements 2 are formed of a resin.

[0022] As described above, the one embodiment of the present invention makes it possible to provide a base fabric for a slide fastener which is dyed simultaneously with any cellulose fiber product and has a better strength than a cotton material. Accordingly, the base fabric is dyed in various colors by piece dyeing, and is dyed in the same color as the product has, so that a region of the slide fastener does not damage a beautiful appearance of the product. Furthermore, the use of the base fabric for a slide fastener according to the one embodiment of the invention makes it possible to provide a product having a slide fastener not broken even when the product undergoes washing or strong distressing.

[0023] The slide fastener having the base fabric for a slide fastener according to the one embodiment of the present invention can be subjected to a dyeing step in the state of being attached to a cellulose fiber product formed of an unbleached and undyed or white yarn or fabric. Even when the cellulose fiber product is dyed in this way after the slide fastener is attached thereto, the base fabric is dyed in a color close to the color of the product. It is therefore unnecessary to attach a fastener having a base fabric dyed in advance to a product to match the color of the base fabric with that of the product, so that the product can be dyed in various colors correspondingly to, for example, a color in fashion.

[0024] The cellulose fiber product is not particularly limited. Examples thereof include clothing products such as pants and jackets, and bags such as a tote bag. Examples of the cellulose fiber for these products include the same cellulose fibers as described above, such as cotton.

EXAMPLES

[0025] Hereinafter, the embodiment of the present invention will be specifically described by way of working examples thereof and comparative examples. However, the present invention is not limited to the working examples.

Example 1:

[0026] An original yarn described below was used as an original yarn material, and then a base fabric was obtained in accordance with a specification described below.

<Original Yarn Material>

[0027]

Weft: lyocell (TENCEL (registered trade name) manufactured by Lenzing AG; fineness: 1.4 dtex, length: 38 mm, dry strength: 35 cN/tex, and wet strength: 27 cN/tex), the proportion thereof being 100% by mass; 30/2; fineness: 197 dtex × 2 (English cotton count: 30/2).
Warp: the same as the weft.

<Specification of Base Fabric Woven Fabric>

[0028]

Weaving width: 15 mm
Weave structure: herringbone weave
Warp density: 66 yarns/inch
Weft density: 52 yarns/inch
Weaving machine: Varitex type needle loom (machine name: BONAS 110)

Example 2:

[0029] A base fabric was obtained in the same way as in Example 1 except that an original yarn described below was

used as an original yarn material.

<Original Yarn Material>

[0030]

Weft: union yarn formed of the same lyocell as used in Example 1, the proportion thereof being 50% by mass, and Modal (manufactured by Lenzing AG; fineness: 1.0 dtex, length: 39 mm, dry strength: 34 cN/tex, and wet strength: 20 cN/tex), the proportion thereof being 50% by mass; fineness: 197 dtex × 2 (English cotton count: 30/2).
Warp: the same as the weft.

Example 3:

[0031] A base fabric was obtained in the same way as in Example 1 except that an original yarn described below was used as an original yarn material.

<Original Yarn Material>

[0032]

Weft: the same lyocell as used in Example 1, the proportion thereof being 100% by mass.
Warp: cotton yarn (UPLAND cotton produced in USA; dry strength: 26 cN/tex, and wet strength: 26 cN/tex), the proportion thereof being 100% by mass; fineness: 197 dtex × 2 (English cotton count: 30/2).

Comparative Example 1:

[0033] A base fabric was obtained in the same way as in Example 1 except that an original yarn described below was used as an original yarn material.

<Original Yarn Material>

[0034]

Weft: the same cotton yarn as used in Example 3, the proportion thereof being 100% by mass.
Warp: the same as the weft.

Comparative Example 2:

[0035] A base fabric was obtained in the same way as in Example 1 except that an original yarn described below was used as an original yarn material.

<Original Yarn Material>

[0036]

Weft: viscose rayon (produced in China; fineness: 1.65 dtex, length: 38 mm, dry strength: 24 cN/tex, and wet strength: 14 cN/tex), the proportion thereof being 100% by mass; fineness: 197 dtex × 2 (English cotton count: 30/2).
Warp: the same as the weft.

Comparative Example 3:

[0037] A base fabric was obtained in the same way as in Example 1 except that an original yarn described below was used as an original yarn material.

<Original Yarn Material>

[0038]

Weft: the same Modal as used in Example 2, the proportion thereof being 100% by mass.
Warp: the same as the weft.

[0039] About the base fabric of each of the above-mentioned working examples and comparative examples, the tensile strength (A) and the tearing strength (B) were measured in accordance with the following methods.

(A) Tensile Strength

[0040] With reference to JIS A-method (strip method) in JIS L 1096:2010, 8.14, the tensile strength was measured by a constant-rate-of-transverse type test. The measurement was made about the strength in the weft direction (direction orthogonal to the sliding direction), along which a high strength is usually applied to the slide fastener. Conditions for the measurement are as described below. About the base fabric, the measurement was made three times. The average of the measured values is shown in Table 1.

<Measuring Conditions>

[0041]

Testing machine: Shimadzu universal material testing machine AGS-J, 5 kN, and analyzing software TRAPEZIUM Lite (each manufactured by Shimadzu Corp.)
Test piece: a piece having a size of 15 mm in the weft direction and a size of 50 mm in the warp direction
Gap between grips: 5 mm
Tensile speed: 150 mm/minute
Temperature: 23.3°C
Humidity: 45.9%

(B) Tearing Strength

[0042] With reference to A-method (single tongue method) in JIS L 1096, 8.17.1, the tearing strength in the weft direction was measured. Conditions for the measurement are as described below. About the base fabric, the measurement was made three times. The average of the measured values is shown in Table 1.

<Measuring Conditions>

[0043]

Testing machine: Shimadzu universal material testing machine AGS-J, 5 kN, and analyzing software TRAPEZIUM Lite (each manufactured by Shimadzu Corp.)
Test piece: a piece having a size of 15 mm in the weft direction and a size of 300 mm in the warp direction
Break size: 100 mm
Gap between grips: 100 mm
Tensile speed: 150 mm/minute
Temperature: 23.3°C
Humidity: 45.9%

[Table 1]

	Warp	Weft	Tensile strength	Tearing strength
Example 1	Lyocell	Lyocell	450N	78.4N
Example 2	Union yarn composed of Lyocell and Modal	Union yarn composed of Lyocell and Modal	423N	67.3N
Example 3	Cotton yarn	Lyocell	456N	
Comparative Example 1	Cotton yarn	Cotton yarn	400N	51.0N

(continued)

	Warp	Weft	Tensile strength	Tearing strength
Comparative Example 2	Viscose rayon	Viscose rayon	349N	38.4N
Comparative Example 3	Modal	Modal	400N	40.5N

[0044] As shown in Table 1, it is understood that the base fabric for a slide fastener obtained in each of Examples 1 to 3 according to the embodiments of the present invention has an excellent tensile strength. When a base fabric contains, in the weft thereof, the modified cellulose fiber specified in the present invention in a proportion of 25% by mass or more, a union yarn containing the specified modified cellulose fiber may be used as shown in Example 2. Furthermore, as shown in Example 3, only the weft may contain the specified modified cellulose fiber.

[0045] It is understood that each of the base fabrics for a slide fastener according to the embodiments of the present invention has an excellent tearing strength. About Example 3, different yarns were used as the warp and the weft, so that the tearing strength in the weft direction was not measurable. Specifically, as shown in Example 1 and Comparative Example 1, a large difference was generated in tearing strength between lyocell and cotton; thus, while the tearing strength was measured in Example 3, the cotton yarn as the warp was torn before the weft was torn, and a precise tearing strength in the weft direction was not measurable. However, it is presumed that in Example 3, lyocell was used as the weft so that the base fabric of Example 3 had a tearing strength close to that of Example 1.

[0046] Although Modal has a dry strength of 30 cN/tex or more, the wet strength thereof is less than 24 cN/tex. About the Modal having a wet strength less than 24 cN/tex, a base fabric of the Modal has a tensile strength equivalent to that of a base fabric of cotton yarn as shown in Comparative Example 3; however, the tearing strength of the Modal base fabric is lowered. Furthermore, about the Modal, the wet strength of which is less than 24 cN/tex, the Modal base fabric does not gain a sufficient strength so that, for example, the Modal base fabric is easily torn in a wet state, for example, when washed.

Claims

1. A method of manufacturing a cellulose fiber product including a step of dyeing, in a single bath, a cellulose fiber product formed of an unbleached and undyed or white yarn or fabric, and a base fabric with a slide fastener attached to the cellulose fiber product,
characterized in that
the base fabric with the slide fastener comprises a woven fabric containing
in a weft thereof a modified cellulose fiber which is lyocell in a proportion of 25% by mass or more, wherein the weft comprises a union yarn or twisted union yarn formed of lyocell and a cellulose fiber other than lyocell, and
in a warp thereof the same material as used as the weft, or a yarn formed of a cellulose fiber, and that
the lyocell has a dry strength of 30 cN/tex or more and a wet strength of 24 cN/tex or more,
wherein weft means a yarn in a direction orthogonal to a sliding direction of the slide fastener in the woven fabric making up the base fabric.

Patentansprüche

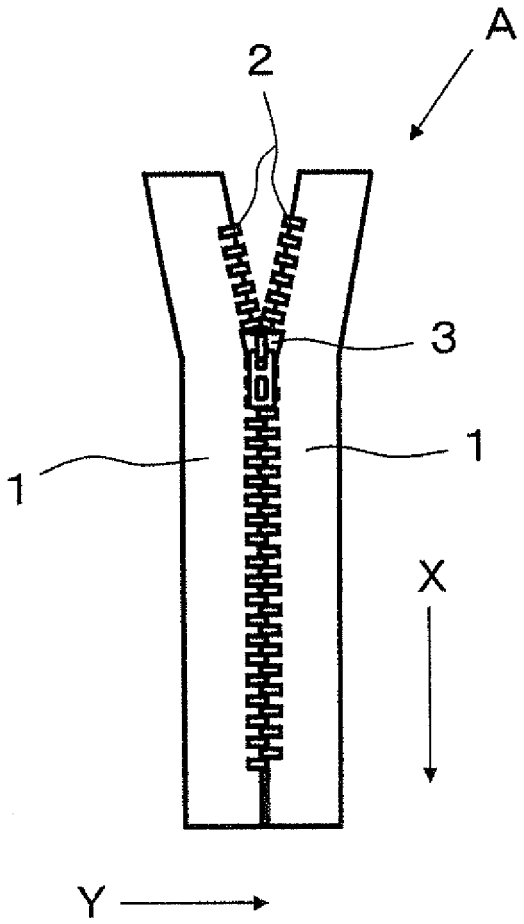
1. Verfahren zur Herstellung eines Cellulose-Faserproduktes, enthaltend einen Schritt zum Färben eines Cellulose-Faserproduktes, gebildet aus einem ungebleichten und ungefärbten oder weißen Garn oder Tuch, und eines Grundtuches mit einem Reißverschluss, der an das Cellulose-Faserprodukt gebunden ist, in einem einzelnen Bad,
dadurch gekennzeichnet, dass
das Grundtuch mit dem Reißverschluss ein Gewebe enthält, das in einem Schuss davon eine modifizierte Cellulosefaser, die Lyocell ist, in einem Anteil von 25 Masse-% oder mehr enthält, worin der Schuss ein Einheitsgarn oder ein getwistetes Einheitsgarn, gebildet aus Lyocell und einer anderen Cellulosefaser als Lyocell, enthält und
in einer Kette davon das gleiche Material, wie es beim Schuss verwendet wird, oder ein Garn enthält, das aus einer Cellulosefaser gebildet ist, und dass
das Lyocell eine Trockenfestigkeit von 30 cN/tex oder mehr und eine Nassfestigkeit von 24 cN/tex oder mehr hat,

worin Schuss ein Garn in einer Richtung orthogonal zu der Gleitrichtung des Reißverschlusses in dem Gewebe, das das Grundtuch ausmacht, ist.

Revendications

1. Procédé de fabrication d'un produit en fibre de cellulose incluant une étape de teinture, dans un bain unique, d'un produit en fibre de cellulose formé d'un fil ou d'un tissu non blanchi et non teint ou blanc, et d'un tissu de base avec une fermeture à glissière attachée au produit en fibre de cellulose,
caractérisé en ce que
le tissu de base avec la fermeture à glissière comprend un tissu tissé contenant dans une trame de celui-ci, une fibre de cellulose modifiée qui est du lyocell dans une proportion de 25 % en masse ou plus, dans lequel la trame comprend un fil d'union ou un fil d'union torsadé formé de lyocell et d'une fibre de cellulose autre que le lyocell, et dans une chaîne de celui-ci, le même matériau que celui utilisé comme trame, ou un fil formé d'une fibre de cellulose, et **en ce que**
le lyocell a une résistance à l'état sec de 30 cN/tex ou plus et une résistance à l'état humide de 24 cN/tex ou plus, dans lequel trame signifie un fil dans une direction orthogonale à une direction de glissement de la fermeture à glissière dans le tissu tissé constituant le tissu de base.

Fig. 1



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP H07246107 A **[0004] [0005]**
- JP 2001204515 A **[0004] [0005]**