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(71) Applicant: **Veneta Stringhe e Affini S.n.c. di Sartor Stefania & C.**
31044 Montebelluna (TV) (IT)

(72) Inventors:
- **TORRESAN, Lorenzo**
  31044 Montebelluna (Treviso) (IT)
- **SARTOR, Stefania**
  31044 Montebelluna (Treviso) (IT)
- **TORRESAN, Nadia**
  31044 Montebelluna (Treviso) (IT)

(74) Representative: **Piovesana, Paolo**
Via F. Baracca, 5/a
30173 Venezia-Mestre (IT)

(54) **METHOD FOR PREPARING NON-UNTYING SHOELACES, PARTICULARLY FOR FOOTWEAR**

(57) An improved method for preparing non-untying shoelaces, particularly for footwear, in which:
- the end portions (4) of a shoelace to be prepared (2) are soaked in an aqueous solution comprising a softener adapted to create a rubbery surface layer,
- the end portions (4) of the shoelace are dried after the extraction thereof from the solution in which they were previously soaked, thus obtaining a shoelace (2) which has, at said end portions (4), a rubbery surface texture which is suitable for ensuring the hold of a knot formed therewith,
and characterized in that said softener comprises a fatty acid amide derivative in aqueous emulsion.

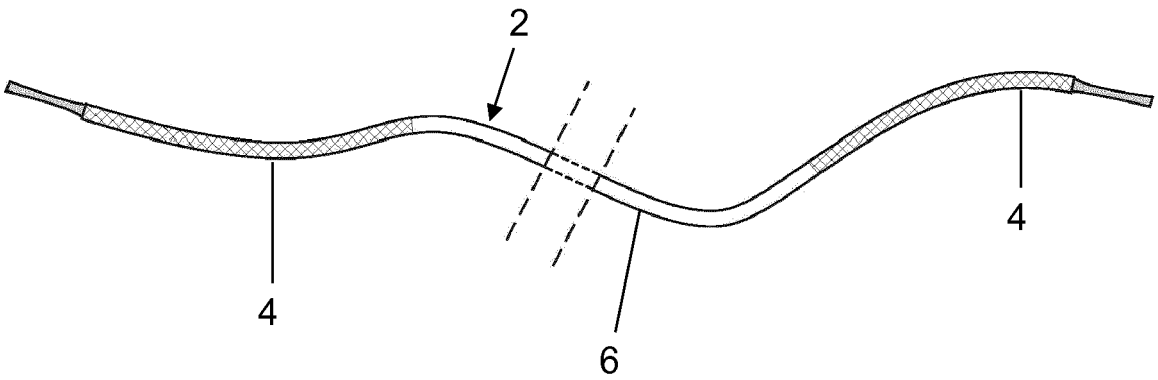

FIG. 2

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Description

[0001] The present invention relates to a method for preparing non-untying shoelaces, particularly for footwear.

[0002] Footwear shoelaces are thin laces which, after crossing one or more eyelets obtained in the vamp of the footwear, are locked to each other by means of a knot which ensures the stability of the closing of the footwear itself.

[0003] Shoelaces may be made of hide, leather, conveniently braided textile fibers or of Technofiber.

[0004] Moreover, traditional shoelaces generally comprise an end reinforcement (also called "aglet"), made of plastic or metal, which serves to prevent the unraveling thereof in addition to facilitating the introduction thereof into the eyelets obtained in the flaps of the vamp of the footwear.

[0005] Shoelaces of known type include the particularly common ones obtained by braiding extruded polyester threads.

[0006] To avoid the untying of the knots made with such shoelaces, scratches are generally made on the shoelaces themselves so as to form a surface fuzz which increases the friction between the parts of shoelace to be tied together, and therefore the hold of the knots.

[0007] However, this process gives the shoelaces, and therefore the footwear to which they are applied, an aged, worn and damaged appearance which often is not pleasing.

[0008] US2009/297793, WO 2015/126627 and US 1941129 describe methods which allow shoelaces with high surface friction to be obtained and which include coating the shoelace with a rubbery surface material.

[0009] It is the object of the invention to propose a method which allows shoelaces to be made which, once tied, prevent the untying of the knot but at the same time do not have the drawbacks encountered in non-untying shoelaces of known type.

[0010] It is another object of the invention to propose a method which is simple, quick and affordable.

[0011] It is another object of the invention to propose a method which is an alternative to and/or is improved with respect to traditional ones.

[0012] These objects, both individually and in any combination thereof, and others which will become apparent from the description below are achieved, according to the invention, with an improved method for preparing shoelaces, preferably for footwear, with the characteristics indicated in claim 1.

[0013] The present invention is hereinbelow further clarified in certain preferred forms of practical preparation thereof, which are described by mere way of non-limiting example, with reference to the accompanying drawings, in which:

Figure 1 shows a perspective view of a shoelace to be processed with the method according to the invention and

Figure 2 shows the fiber in fig. 1 processed with the method according to the invention.

[0014] As shown in figure 1, shoelace 2 to be processed with the method according to the invention consists of an extruded polyester thread braid.

[0015] Conveniently, according to the present invention, only the end portions 4 of shoelace 2 are processed with the method according to the invention, while the middle portion 6 is not processed. In particular, the end portions 4 substantially are 20-30 cm long.

[0016] The method according to the invention includes soaking the end portions 4 of shoelace 2 in a solution comprising, alone or combined with other substances, a fatty acid amide derivative in aqueous emulsion and/or an aqueous dispersion of at least one aliphatic polyurethane.

[0017] In greater detail, the aqueous dispersion of a fatty acid amide derivative in aqueous emulsion and/or of at least one aliphatic polyurethane serve as elastic surface softeners, which give the portions 4 of shoelace to be processed a rubbery surface texture and promote the stability of the tie thereof, once tied.

[0018] Preferably, such an aqueous dispersion of at least one aliphatic polyurethane is known under the trade name POLITEX PU/38 or POLITEX PU/40.

[0019] Preferably, the fatty acid amide derivative in aqueous emulsion is a cationic softener for acrylic fibers known under the trade name NOVASOFT CF/19.

[0020] Conveniently, the end portions 4 of shoelace 2 are soaked for about 20 minutes in such a solution at a temperature of about 40-45°C.

[0021] Advantageously, the solution in which the end portions 4 of shoelace 2 are soaked also comprises an acetic acid, which serves the function of promoting the sticking of the softener to the shoelace, even if the water in the solution is acidic. In particular, the presence of the acetic acid allows normal tap water to be used to prepare the solution.

[0022] Advantageously, the solution also comprises a colloidal silica dispersion which serves the function of moistening the surface of the end portions 4 of the shoelace. Preferably, such a dispersion is known under the trade name "SILICEL AN" and is an anti-slip agent with anionic charge for fabrics with movable and sliding weft.

[0023] In greater detail, in a first form of preparation, the solution contains:

- one liter of water,
- about 100 grams of aliphatic polyurethane such as POLITEX PU/38,
- about 1-3 ml of acetic acid.

In a second form of preparation, solution 10 contains

- one liter of water,
- about 200 grams of aliphatic polyurethane such as

POLITEX PU/40,
- about 1-3 ml of acetic acid.

[0024] In a third form of preparation, solution 10 contains

- one liter of water,
- about 100 grams of aliphatic polyurethane such as POLITEX PU/40,
- about 1-3 ml of acetic acid,
- about 40-100 grams of colloidal silica such as SILICEL AN.

[0025] In a fourth form of preparation, solution 10 contains

- one liter of water,
- about 30 grams of a fatty acid amide derivative in aqueous emulsion such as NOVASOFT CF,
- about 1-3 ml of acetic acid,
- about 40-100 grams of colloidal silica such as SILICEL AN.

[0026] At the end of the soaking, the end portions 6 of shoelace 2 are extracted from the solution in which they were soaked, are dried for about 30 minutes preferably at a temperature of about 90°C and are thus ready for use.
[0027] In particular, shoelace 2 thus obtained has, at the end portions 4 which were soaked in the processing solution, a rubbery surface texture with high surface friction which ensures a satisfactory hold of the knot made with such portions.
[0028] From the above, it is apparent that the method according to the invention is much more advantageous with respect to traditional methods because it allows a non-untying shoelace to be obtained with no unappealing surface fuzz and moreover, due to the fact that it includes a processing of the shoelace localized only at the end portions 4 thereof, it allows the consumption of the solution used for the soaking to be optimized, thus leaving unaltered the original aspect and texture of the middle portion 6 of the shoelace itself, which is not involved in the knot and thus should not necessarily have non-untying features.

Claims

1. An improved method for preparing non-untying shoelaces, particularly for footwear, in which:

- the end portions (4) of a shoelace to be prepared (2) are soaked in an aqueous solution comprising a softener adapted to create a rubbery surface layer,
- the end portions (4) of the shoelace are dried after the extraction thereof from the solution in which they were previously soaked, thus obtaining a shoelace (2) which has, at said end portions (4), a rubbery surface texture which is suitable for ensuring the hold of a knot formed therewith,

and **characterized in that** said softener comprises a fatty acid amide derivative in aqueous emulsion.

2. A method according to claim 1, **characterized in that** said end portions (4) are about 20-30 cm long.

3. A method according to one or more of the preceding claims, **characterized in that** said shoelace to be prepared (2) consists of an extruded polyester thread braid.

4. A method according to one or more of the preceding claims, **characterized in that** said softener comprises an aqueous dispersion of at least one aliphatic polyurethane.

5. A method according to one or more of the preceding claims, **characterized in that** said softener consists of a fatty acid amide derivative in aqueous emulsion.

6. A method according to one or more of the preceding claims, **characterized in that** said end portions (4) of the shoelace to be prepared (2) are soaked for about 20 minutes in said solution at a temperature of about 40-45°C.

7. A method according to one or more of the preceding claims, **characterized in that** said solution also comprises acetic acid to assist and facilitate the sticking of said softener to the end portions (4) of said shoelace to be prepared (2).

8. A method according to one or more of the preceding claims, **characterized in that** said softener also comprises a colloidal silica dispersion aimed at moistening the surface of the end portions (6) of said shoelace to be prepared (2).

9. A method according to one or more of the preceding claims, **characterized in that** the end portions (4) are dried for about 30 minutes at a temperature of about 90°C.

10. A method according to one or more of the preceding claims, **characterized in that** said solution comprises one liter of water, 100-200 grams of said softener, 1-3 ml of acetic acid and 40-100 grams of colloidal silica.

11. A method according to one or more of the preceding claims, **characterized in that** said fatty acid amide derivative in aqueous emulsion is a cationic softener for acrylic fibers.

12. A method according to one or more of the preceding claims, **characterized in that** said aqueous solution comprises 30 grams of said fatty acid amide derivative in aqueous emulsion per each liter of water.

13. A method according claims 7, 8 and 12, **characterized in that** said aqueous solution also comprises 1-3 ml of acetic acid and 40-100 grams of colloidal silica per each liter of water.

14. A non-untying shoelace (2) **characterized in that** the end portions (4) thereof have a rubbery surface layer comprising a fatty acid amide derivative in aqueous emulsion.

15. A non-untying shoelace (2) **characterized in that** it is obtained by means of the method according to one or more of claims 1 to 13.

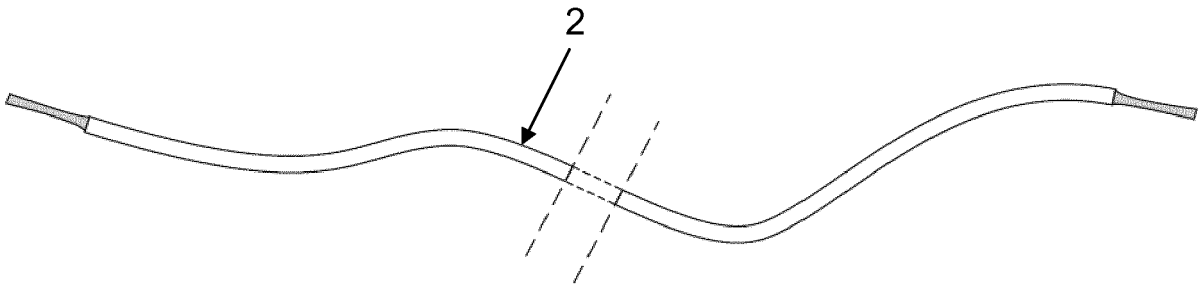

FIG. 1

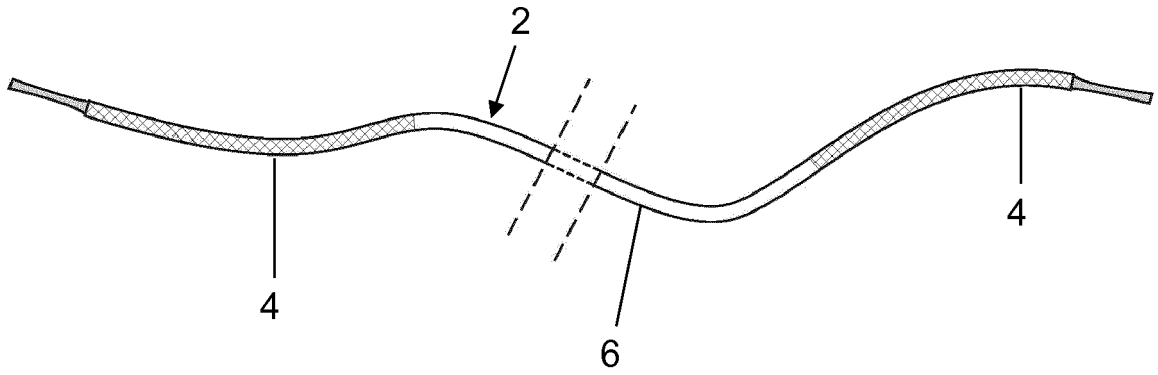

FIG. 2

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EUROPEAN SEARCH REPORT

Application Number
EP 16 20 5891

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	US 2009/297793 A1 (YUN ADRIAN DANIEL [US]) 3 December 2009 (2009-12-03) * paragraphs [0024] - [0028]; figure 1 *	1-7,9, 11,12, 14,15	INV. A43C9/04 A43C9/00
Y	CA 806 209 A (EMERY INDUSTRIES INC) 11 February 1969 (1969-02-11) * the whole document *	1-7,9, 11,12, 14,15	
A	WO 2015/126627 A1 (HILDERBRAND HENRY LUCIUS [US]) 27 August 2015 (2015-08-27) * paragraphs [0039], [0044]; figures *	1-15	
A	US 1 941 129 A (MATSON CARL A) 26 December 1933 (1933-12-26) * page 1, line 16 - line 93 *	1-15	
A	DE 557 418 C (ADOLPH SCHOELER DR) 23 August 1932 (1932-08-23) * the whole document *	1-15	TECHNICAL FIELDS SEARCHED (IPC)
A	WO 2008/142195 A1 (ROCA PAUNER JUAN PASCUAL [ES]) 27 November 2008 (2008-11-27) * the whole document *	1-15	A43C A43D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	16 May 2017	Cianci, Sabino

CATEGORY OF CITED DOCUMENTS

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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 16 20 5891

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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16-05-2017

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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- WO 2015126627 A **[0008]**
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