(19) Europäisches Patentamt
European Patent Office
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(11) **EP 2 818 442 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
31.12.2014 Bulletin 2015/01

(51) Int Cl.:
B66C 1/18 *(2006.01)* ***D07B 1/16*** *(2006.01)*

(21) Application number: **14174069.6**

(22) Date of filing: **26.06.2014**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

(30) Priority: **26.06.2013 ES 201330964**

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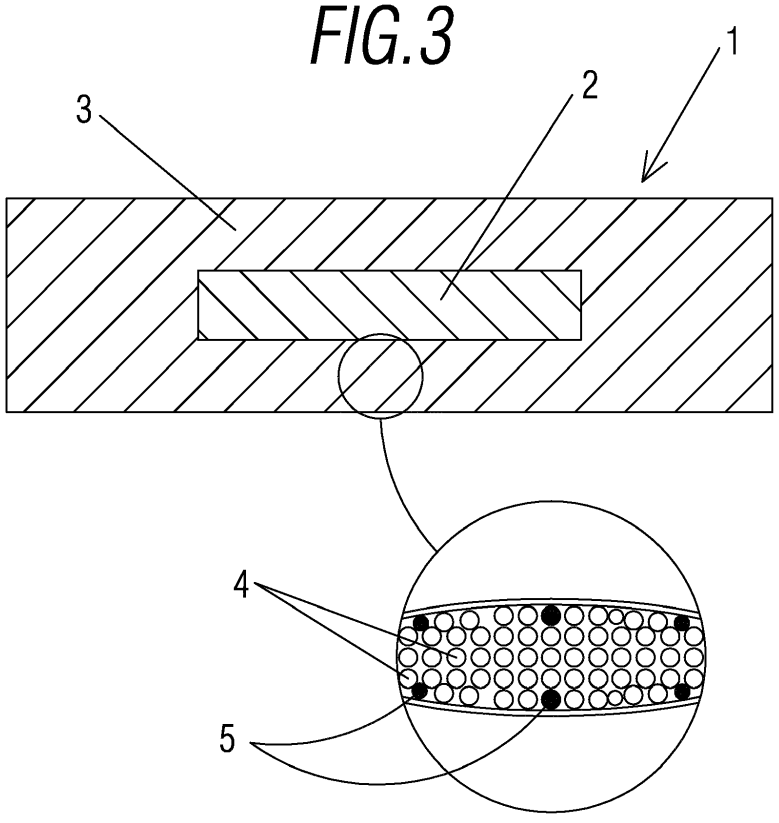
(54) **Process for manufacturing a textile round sling and sling obtained**

(57) Process for manufacturing a Textile round sling (1) being this one provided for lifting and handling loads, which comprises an inner core (2) that have a plurality of endless yarns which run longitudinally and parallel to each other and an outer casing (3) made of a textile material which covers the inner core (2) and with configuration able to exhibit a high wear resistance. During the step [**10**] of manufacturing the outer casing (3), some silicone yarns (4; 5) with/or a silicone base are applied in the warp. Subsequently a dispersion [step **20**] of a mixture of polyurethane and a catalyst with a base solution of aliphatic polyisocyanate is applied.

FIG.3



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Description

OBJECTIVE OF THE INVENTION

[0001] This patent of invention application has as objective registering a process for the fabrication of a textile round sling that incorporates significant innovations and advantages.

[0002] Concretely, the invention proposes the development of a textile round sling that is intended for being used in the lifting and manipulation of heavy loads, it provides greater wear resistance compared to conventional slings.

BACKGROUND OF THE INVENTION

[0003] The textile round slings are used for lifting heavy loads; they are usually constituted by a certain core of high strength yarns totally covered by a tubular woven fabric. They are manufactured according to a predetermined length and with a ring shape or rectilinear shape with end loops or grommets disposed at two opposite ends.

[0004] During its useful live the round sling is subjected to deterioration mainly originated by friction, either by direct contact of the sling with the load or by direct contact of the sling with the ground; in such a manner that said friction causes wear of the sling surface and particularly along the edges and that reduce the useful live of the sling, with the consequent risk of causing an accident in case of breakage of the sling during its use, because of that, it exists a need of improving the configuration and fabrication process of the slings currently known in the prior art.

DESCRIPTION OF THE INVENTION

[0005] The present invention has been developed in order to provide a process for the manufacture of a sling which is configured as a novelty in the field of application, and solving the previously mentioned disadvantages, in addition to provide, also, another additional advantages that will be apparent from the description that accompanies as follows.

[0006] Then, it is an object of the present invention providing a new procedure for the manufacturing of a textile round sling, being this sling provided for the lifting and handling that comprises an inner core that have a plurality of endless yarns which run longitudinally and parallel to each other and an outer casing made of a textile material which covers the inner core.

[0007] During the step of manufacturing the outer casing, high resistance yarns with a silicon base are applied in the warp of the casing and subsequently a dispersion of a mixture of polyurethane and a catalyst with a base solution of aliphatic polyisocyanate is applied.

[0008] In this documentation is understood as Textile round sling, the one that has a cross section of circular outline, significantly circular or elliptical.

[0009] The aim of these yarns with silicone material along the warp is protecting the textile round sling of cuts and/or damage due to possible contact with edges, corners or other surfaces susceptible to tear or damage the sling.

[0010] According to another aspect of the invention, the dispersion of the polyurethane mixture and a catalyst with an aliphatic polyisocyanate base solution is conducted through an impregnation bath of the outer casing.

[0011] Advantageously, after the dispersion of the polyurethane mixture a further step of padding is applied. This allows that the impregnation of the tubular outer casing is for the outside part as well as the inside part, ensuring anti-abrasive protection. Subsequently to the further step of padding is performed a drying step, that allows to fix the three-dimensional network shaped previously in the pre-drying to provide greater stability and therefore greater anti-abrasive efficiency.

[0012] It is also another object of the invention to provide a textile round sling for lifting and handling loads That comprises an inner core that have a plurality of endless yarns which run longitudinally and parallel to each other and a textile tubular outer casing characterized by the fact that includes a plurality of high strength yarns with a silicon base and run parallel to the warp yarns which form part of the textile tubular outer casing.

[0013] Other features and advantages of the procedure for manufacturing a sling, object of the present invention, will become evident starting from the description of a preferred embodiment, but not exclusive, illustrated as a non-limitative example in the attached figures, in which:

BRIEF DESCRIPTION OF THE FIGURES

[0014]

Figure 1: it is a block diagram of one embodiment of process for making a textile sling according to the present invention

Figure 2: it is a perspective view of a sling obtained with the invention process

Figure 3: it is a schematic cross-sectional view along the A-A line present in the sling, shown in Figure 1 with an enlarged detail.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0015] In view of the mentioned figures and in accordance with the numbering, can be seen in them a preferred embodiment of the invention, which covers parts and elements illustrated and described in detail below.

[0016] With particular reference to Figures 1 and 2, a method for manufacturing a textile sling (1) for example, constituted by an elongate section (11) provided at both

ends with end loops (12) which would serve as attachment areas is detailed as follows. As shown in Figure 3, textile sling (1) is constituted by a inner core(2) provided with a plurality of endless yarns which run longitudinally and parallel to each other and a outer casing (3), enveloping the inner core (2).

[0017] To manufacture, and with particular reference to the outer casing (3) in a first step (10) is applied in its warp (formed by a plurality of high strength yarns (4)) yarns of high strength silicone (5) and subsequently, a dispersion step is applied (20) of a mixture of polyurethane and a catalyst with a base solution of aliphatic polyisocyanate

[0018] The dispersing step (20) of the polyurethane mixture, and a catalyst with a solution base of aliphatic polyisocyanate is conducted through an immersion bath of the ENVOLTURA EXTERIOR.

[0019] Then, after the dispersing step (20) of the polyurethane mixture a further step of padding (30) is applied where the sling is passed through a series of pressure cylinders to reduce the liquid volume present in the sling from the bath. Subsequently, is performed a pre-drying step (40) and a drying step (50) that allow a good crosslinking of the polyurethane dispersion to achieve optimum properties for offering the maximum protection. In the pre-drying step (40) the three-dimensional network of the polymeric chains is formed, so it is important to maintain a proper temperature range, for example between 110 °C and 130 °C for a period of 30 to 45 seconds approximately, as well as a speed tape path for achieving a suitable three-dimensional network.

[0020] In the drying step, which takes place in a temperature range of about 160-180 approximately, is set the three-dimensional network in a molecular level for remaining stable and because of that, obtaining greater efficiency anti-abrasive

[0021] The details, shapes, dimensions and other accessory elements, as well as the materials used in manufacturing of the sling obtained by the process of the invention may be conveniently replaced by others that are technically equivalent and do not diverge from the essentiality of the invention or the scope defined by the claims that are included as follows:

Claims

1. Process for manufacturing a Textile round sling (1), being this one provided for lifting and handling loads that comprises an inner core that have a plurality of endless yarns which run longitudinally and parallel to each other and an outer casing (3) made of a textile material which covers the inner core (2) characterized for the fact that during a step (10) of manufacturing of the outer casing, are applied in the wrap of this outer casing some yarns of silicone with/or a silicone base, and then are applied a mixture of polyurethane and a catalyst with a base solution aliphatic polyisocyanate.

2. Process according to claim 1, **characterized by** the fact that the dispersion of the mixture of polyurethane and a catalyst with a solution base of aliphatic polyisocyanate is carried out using an impregnation bath of the outer casing (3).

3. Process according to claim 1, **characterized by** the fact that after dispersing the polyurethane mixture a further step of padding (30) is applied

4. Process according to claims 1 and 3, **characterized by** the fact that subsequent to the further step of padding (30) is performed at a drying step (50)

5. Process according to claim 4, **characterized by** the fact that prior to the drying step (50) is performed a pre-drying step (40).

6. A Textile round sling (1), being this one provided for lifting and handling loads That comprises an inner core (2) that have a plurality of endless yarns which run longitudinally and parallel to each other and an outer casing (3) made of a textile material which covers the inner core (2 **characterized by** the fact that the textile tubular outer casing includes a plurality of high strength yarns with a silicon base and run parallel to the warp yarns which form part of the textile tubular outer casing (3).

FIG.1

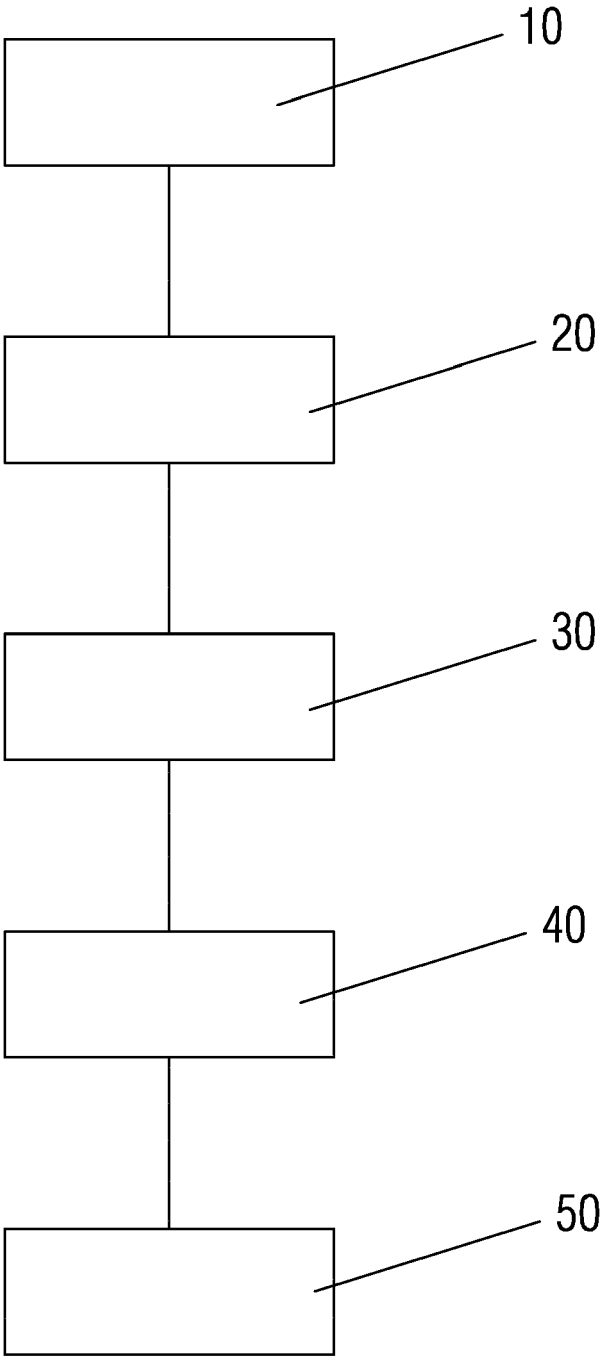


FIG.2

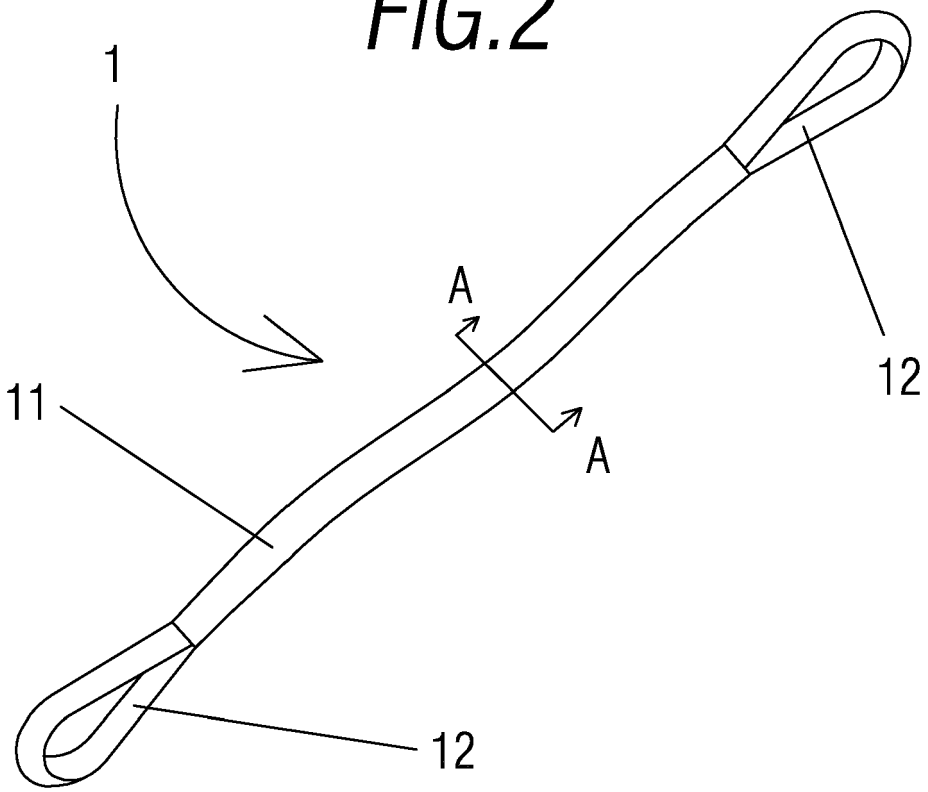
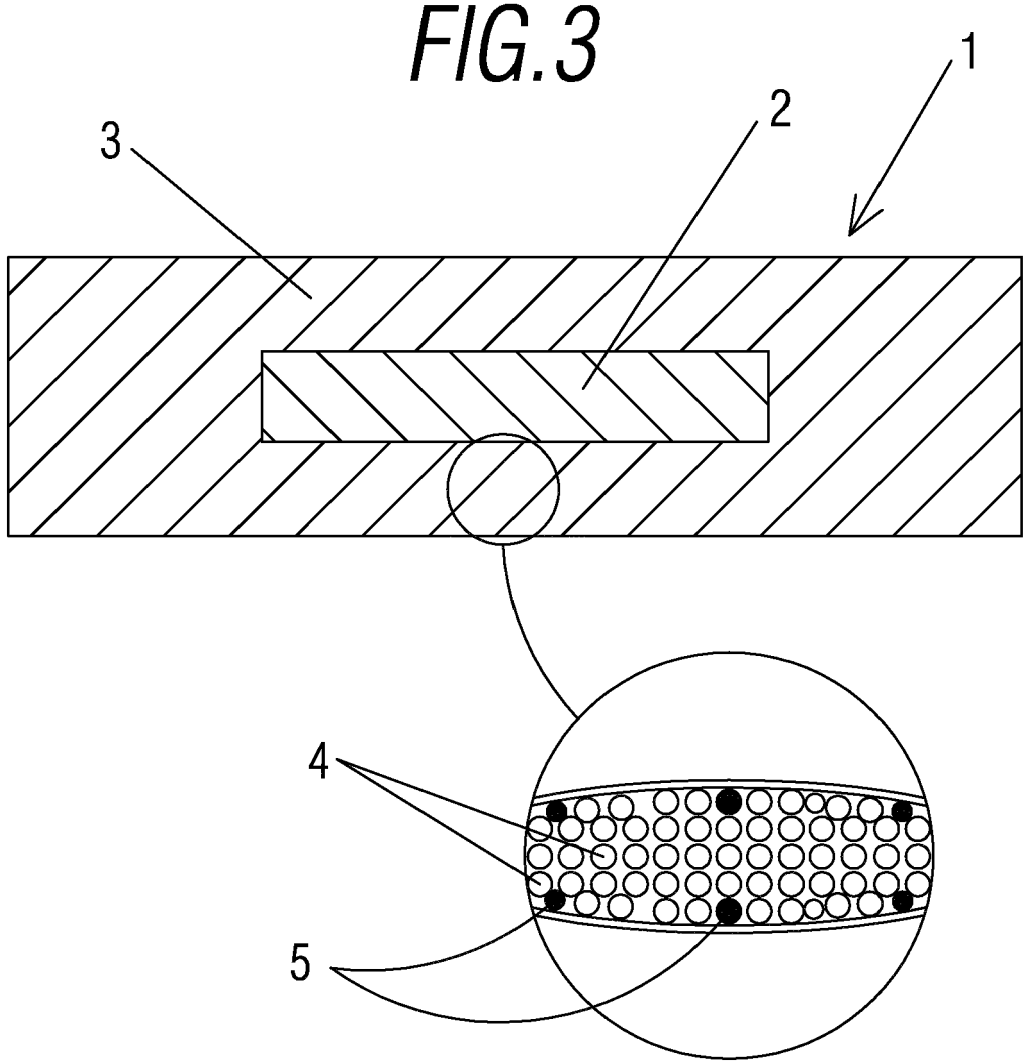


FIG.3



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EUROPEAN SEARCH REPORT

Application Number
EP 14 17 4069

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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TECHNICAL FIELDS SEARCHED (IPC)
B66C D07B D03D D01F D02G

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	14 October 2014	Guthmuller, Jacques

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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E : earlier patent document, but published on, or after the filing date
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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 14 17 4069

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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14-10-2014

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