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(54) Title: STRUCTURAL ARRANGEMENT FOR A TEXTILE STRAP WITH FLUORESCENT COATING

(57) Abstract: The utility model relates to a structural arrangement for a textile strap with fluorescent coating, wherein the textile strap is made of synthetic fibres and natural fibres, it is preferably belt-shaped, and has a plastic coating covering 100% of its surface.

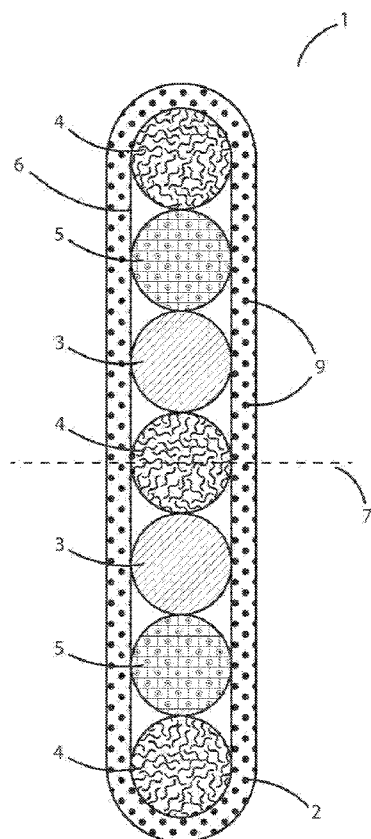


Figure 1



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Structural arrangement for a textile strap with fluorescent coating

[0001] The utility model relates to a structural arrangement for a textile strap with fluorescent coating, wherein the textile strap is made of synthetic fibres and natural fibres, it is preferably belt-shaped, and has a plastic coating covering 100% of its surface.

[0002] Both in everyday and industrial use there is a great need for plates produced by dipping, lamination or extrusion technology, belt-shaped conveyor elements, machine parts, where the tensile strength of the product is ensured by a textile strap, and the other preferred physical properties, such as a non-slip, water-repellent, abrasion-resistant or flexible surface, by a plastic or rubber coating.

[0003] The materials, that is the textile strap and the coating, melted mostly from granules, powder or block rubber and additives, are combined in order to combine the preferred properties of the different components in the final product, bearing in mind the special requirements of use. The adhesion between the fabric and the coating covering it is of primary importance in most cases. Imperfect adhesion excludes the product from many of the fields of application, as even the smallest damage to the coating can cause it to separate from the textile strap.

[0004] In the prior art utility model No. US 5,063,615 discloses a coextruded plastic belt strap, wherein a thin plastic layer equal to $1/5^{\text{th}}$ and a thick plastic layer equal to $4/5^{\text{th}}$ of the total thickness are extruded together. An adhesion promoting film layer is placed between them.

[0005] Another solution is presented in utility model No. WO 2010122978 A1 disclosing a rubber composition for a conveyor belt. According to the utility model a galvanized steel cord covered with an adhesive rubber layer is interposed between cover rubber layers. The top layer of the conveyor belt is a rubber composition which excels in durability and productivity, furthermore the rubber used for the conveyor belt can be easily shaped and formed.

[0006] Utility model No. DE 10 2006 025 562 A1 discloses a transmission belt made of an elastic material with an embedded tension-bearing layer, wherein the tension-bearing layer consists of at least one layer of plastic film made of a material with high tensile strength and low elongation. Preferably, the outer plastic layer has a non-slip and textured surface. The utility model discloses many possible compositions for the plastic film. Among other things, it mentions the embedding of a fabric layer made of polyester or polyamide fibres, or a combination thereof.

[0007] However, a shortcoming of the prior art is that an advantageous property of polypropylene based fabrics (films) is not sufficiently kept in mind, namely that during processing PP fibres melt together perfectly with most other plastics, providing adhesion between the fabric layer and the coating, furthermore a wide-ranging number of plastics adhere well to polypropylene. According to the prior art the number of plastic variants adhering well to polyester is low, furthermore the price of the base material is higher. A disadvantage of polypropylene fibres from the point of view of load-bearing is the melting point, which is often below the processing temperature of plastic base materials. Although the PP fabric and the granules melt together during the known joining processes, the PP fibres lose most of their load-bearing ability and flexibility.

[0008] In the prior art there are numerous known plastic and/or rubber products containing fluorescent pigment. Their task is, in addition to aesthetic benefits, to ensure high visibility.

[0009] With this utility model the task is to develop a structural arrangement for a textile strap with fluorescent coating, preferably a belt, the outer plastic coating of which adheres perfectly to the embedded textile strap. At least two kinds of base materials should be selected as synthetic fibres for the textile strap. Thus a part of the synthetic fibres melts together with the coating during the joining process of the coating and the textile strap, while the other part retains most of its flexibility. In order to prevent excessive elongation during the joining of the coating and the textile strap, natural-based fibres with low elongation properties are mixed to the synthetic fibres. Furthermore the task is to develop a textile strap, for which the base material

of the coating can be selected from the widest possible range, ensuring that the coating and the textile strap adhere together as strongly as possible during a known joining process. This allows the use of heavy-duty fabrics with a protective coating for the most specific applications. Furthermore the task is to combine the coating with a fluorescent dye, allowing the finished products to be used for a high visibility and a load-bearing function simultaneously, in particular as dog collars, leashes.

[0010] The utility model is based on the recognition that in strap-shaped belts covered with plastic an unbreakable adhesion between the coating and the fabric embedded into it by melting them together is preferable. For example, the number of plastics adhering well to polyester fibres is low, however, the high melting point of polyester is perfectly suitable for joining with the coating at high temperatures.

[0011] Furthermore it is also recognized that by mixing at least two kinds of synthetic fibres and cotton fibres in the textile strap adhesion can be produced between the textile strap and the coating without any need for an adhesive or other additives. With the appropriate selection of the base materials, a part of the synthetic fibres in the fabric portion melts together with the material of the coating during a known extrusion or dipping process, ensuring good adhesion to the coating, while the other part of the synthetic fibres in the fabric portion, with a higher melting point, is not damaged at the high temperature and ensures the load-bearing ability of the belt. However, these synthetic fibres get elongated due to the heat, which is undesirable from the point of view of load-bearing. In order to avoid deterioration by elongation, natural-based fibres with lower elongation due to heat can be incorporated into the fabric structure. The fluorescent dye/pigment does not reduce the desirable physical properties of the finished product, it is mixed into the material of the coating on the basis of an already known technology, and the equipment thus made preferably has a high visibility function as well.

[0012] Thus the utility model relates to a structural arrangement for a textile strap with fluorescent coating, wherein the textile strap comprising warp and weft yarns is made of at least one layer of synthetic-based fibres, it is

preferably belt-shaped, and has a plastic-containing coating covering 100% of its surface.

[0013] The essence of the development is that synthetic-based fibres with a melting point equal to or lower than that of the coating, melting together with the coating, and load-bearing synthetic fibres with a melting point higher than that of the coating are incorporated into the textile strap, furthermore a fluorescent dye/pigment is mixed into the material of the coating.

[0014] Preferably, natural-based fibres with low elongation are incorporated into the textile strap.

The load-bearing synthetic fibres, the synthetic fibres melting together with the coating and the natural-based fibres are incorporated into the textile strap at least as warp yarns, kept together by the weft yarns. In the textile strap the load-bearing synthetic fibres, the synthetic fibres melting together with the coating and the natural-based fibres are arranged symmetrically on both sides of the axis line.

The material of the coating is most preferably (Thermoplastic) elastomer-based.

The material of the load-bearing synthetic fibres is most preferably polyester.

The material of the synthetic fibres melting together with the coating is most preferably polypropylene.

The material of the natural-based fibres incorporated into the textile strap is most preferably cotton- and/or linen-based.

The material of the weft yarns in the textile strap, up to at least 50% of the total weight of the weft yarns, is polyester. The surface of the coating is preferably sandblasted and/or textured.

The proportion by weight of the load-bearing synthetic fibres in the warp yarns of the textile strap is minimum 50%.

[0015] The utility model is illustrated in the following figures:

Figure 1 shows a cross-sectional view of the structural arrangement of the synthetic fibres melting together with the coating containing fluorescent pigment, the load-bearing synthetic fibres and the

natural-based fibres, covered by the coating, in a symmetrical arrangement.

Figure 2 shows a cross-sectional view of the arrangement of the natural-based fibres in the fabric structure, and a preferred method of surface finishing.

[0016] Figures 1 and 2 show a cross-sectional view of the structural arrangement for a textile strap with fluorescent coating **1** according to the utility model. The synthetic fibres melting together with the coating **3**, the load-bearing synthetic fibres **4** and the natural-based fibres **5** are shown in a symmetrical arrangement as warp yarns along the axis line **7**, kept together by the weft yarns **6**. The coating **2** is preferably a skin-friendly plastic, covering 100% of the fabric, it is most preferably made by extrusion with a minimum thickness of 0.8 mm. Figures 1 and 2 show the most preferred, even distribution of the fluorescent pigment **9**.

[0017] Figure 2 shows that the textile strap **1a** is most preferably bounded by the weft yarns **6**, and is preferably belt-shaped. The strap has preferably a grooved or sandblasted surface finish **8**, and displays a brand name protruding from the surface.

[0018] The structural arrangement for a textile strap with fluorescent coating allows the wide use of polypropylene base materials in various known manufacturing processes, in which the plastic-containing coating melts together with these polypropylene fibres, while the load-bearing function is ensured by natural-based fibres and load-bearing synthetic fibres with a melting point higher than that of polypropylene. Thus the load-bearing ability of the coating is also increased, as it works together with the textile strap. The use of fluorescent pigment mixed into the coating allows the structural arrangement for a textile strap with fluorescent coating to be used as fashion items and as high visibility equipment simultaneously.

List of reference numbers

1) Structural arrangement for a textile strap with fluorescent coating

1a) Textile strap

2) Coating

3) Synthetic fibres melting together with the coating

4) Load-bearing synthetic fibres

5) Natural-based fibres

6) Weft yarn

7) Axis line

8) Surface finish

9) Fluorescent pigment

Claims

- 1) A structural arrangement for a textile strap with fluorescent coating, wherein the textile strap is made of at least one layer of synthetic-based fibres, it is preferably belt-shaped, and has a plastic-containing coating covering 100% of its surface, characterized in that at least one synthetic-based fibre **(3)** with a melting point equal to or lower than that of the coating **(2)**, melting together with the coating, and load-bearing synthetic fibres **(4)** with a melting point higher than that of the coating **(2)** are incorporated into the textile strap **(1a)**, furthermore a fluorescent dye/pigment **(9)** is mixed into the material of the coating **(2)**.
- 2) The structural arrangement for a textile strap with fluorescent coating **(1)** according to claim 1, characterized in that natural-based fibres **(5)** with low elongation are incorporated into the textile strap **(1a)**.
- 3) The structural arrangement for a textile strap with fluorescent coating **(1)** according to claims 1-2, characterized in that the load-bearing synthetic fibres **(4)** the synthetic fibres melting together with the coating **(3)** and the natural-based fibres **(5)** are incorporated into the textile strap **(1a)** most preferably as warp yarns, kept together by the weft yarns **(6)**.
- 4) The structural arrangement for a textile strap with fluorescent coating **(1)** according to claims 1-3, characterized in that in the textile strap **(1a)** the load-bearing synthetic fibres **(4)**, the synthetic fibres melting together with the coating **(3)** and the natural-based fibres **(5)** are arranged symmetrically on both sides of the axis line **(7)**.
- 5) The structural arrangement for a textile strap with fluorescent coating **(1)** according to claims 1-4, characterized in that the material of the coating **(2)** is most preferably (Thermoplastic) elastomer-based, the material of the load-bearing synthetic fibres **(4)** is polyester, while

the material of the synthetic fibres melting together with the cover **(3)** is most preferably polypropylene.

- 6) The structural arrangement for a textile strap with fluorescent coating **(1)** according to claims 1-5, characterized in that the material of the natural-based fibres **(5)** incorporated into the textile strap **(1a)** is most preferably cotton- and/or linen-based.
- 7) The structural arrangement for a textile strap with fluorescent coating **(1)** according to claims 1-6, characterized in that the material of the weft yarns **(6)** in the textile strap **(1a)**, up to at least 50% of the total weight of the weft yarns **(6)**, is polyester.
- 8) The structural arrangement for a textile strap with fluorescent coating **(1)** according to claims 1-7, characterized in that the surface of the coating **(2)** is preferably sandblasted and/or textured.
- 9) The structural arrangement for a textile strap with fluorescent coating **(1)** according to claims 1-8, characterized in that the proportion by weight of the load-bearing synthetic fibres **(4)** in the warp yarns of the textile strap **(1a)** is minimum 50%.

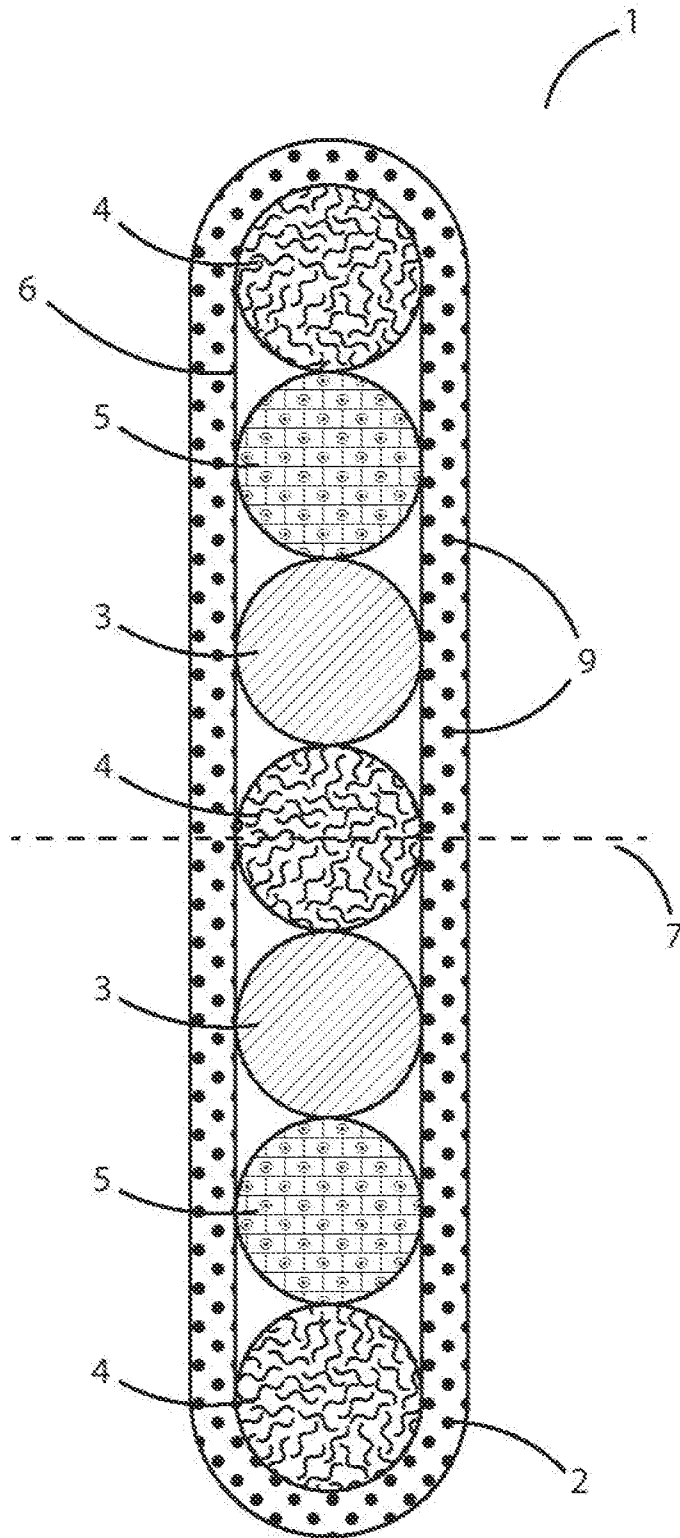


Figure 1

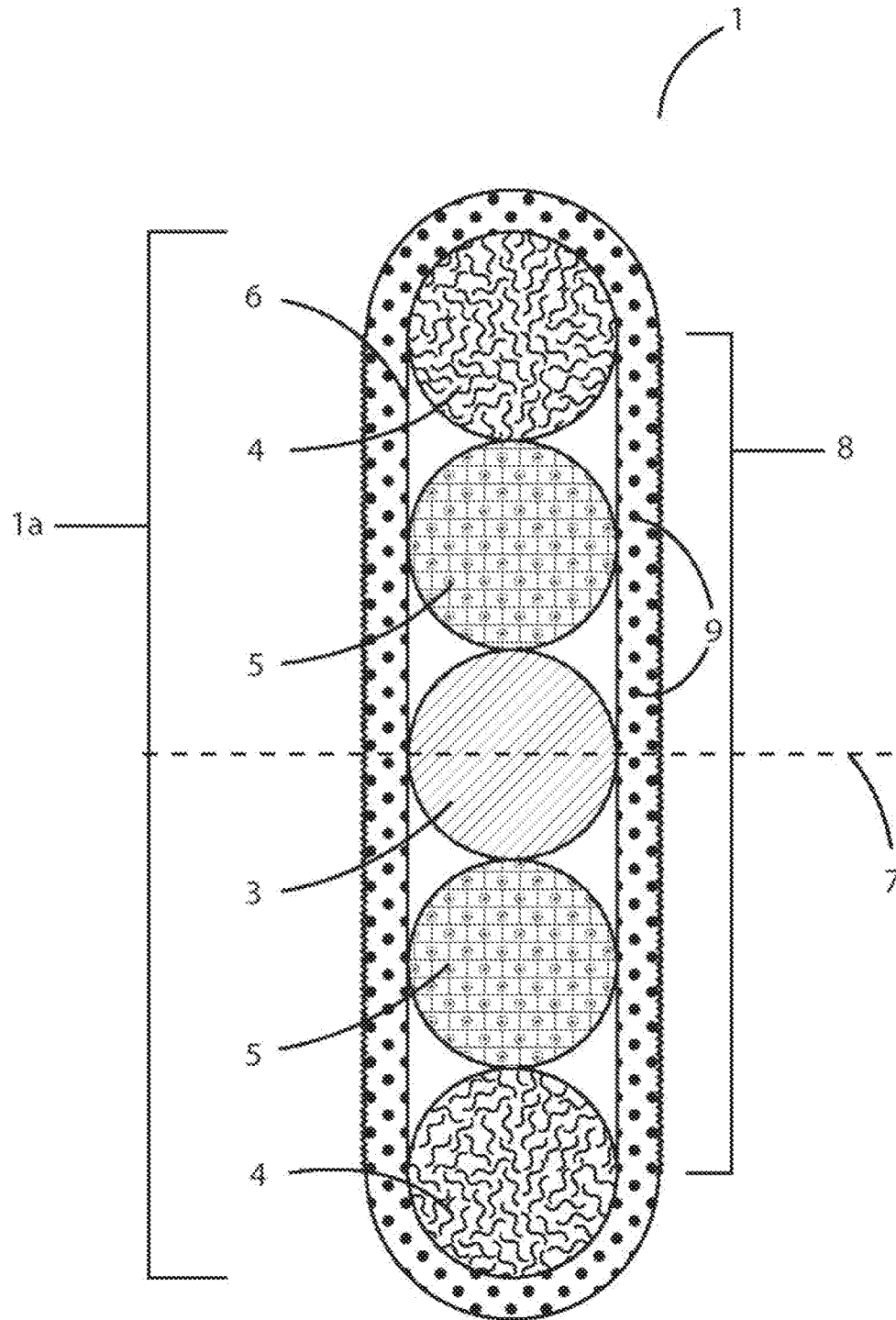


Figure 2