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(54) Shrinkproof elastic tape and a method of making same

(57) An elastic tape is disclosed as including a warp yarn and a weft yarn, in which the warp yarn includes an elastomeric core yarn wound around by a thermo-fusible yarn which is adapted to melt in heat and bonded with the adjacent yarn(s). There is also disclosed a method of forming an elastic tape, including the steps of (a) winding a thermo-fusible yarn around an elastomeric core yarn to form a first yarn; (b) weaving or knitting the first yarn and at least a weft yarn integrally with one another, with the first yarn as a warp yarn; and (c) heat treating the yarns to melt the thermo-fusible yarn to integrally bond with the adjacent yarn(s).

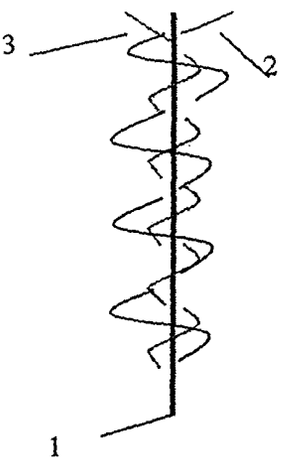

Fig. 1

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Description

[0001] This invention involves an elastic tape, which may be woven or knitted, and in particular such a tape having shrinkproof characteristics with no runback, fraying or raveling, and a method of making such a tape.

Background of the Invention

[0002] Elastic are extensively used in the textile industry and other aspects of daily life, and in particular in the garment industry. Elastic tape is an indispensable accessory for the underwear industry. Existing elastic tapes are generally composed of weft and warp yarns, in which part of the yarns are the core yarns. Elastomeric yarns are used for the core, whereas the sheath may consist of other textile fibres, such as nylon, polyester or cotton yarns. When such an elastic tape is repeatedly stretched during use, the elastic core yarns are prone to runback, and the elastomeric yarn ends in the tape are prone to protrude from the tape edge or from a broken point. For example, in the case of an elastic tape used at the top of briefs, it often occurs that the core yarns are broken by the needle in sewing, usually in the joint position. The elastomeric yarns will protrude from the cut or broken end, or the core yarns will runback after the briefs are used for a number of times. Along with the continuous enrichment and enhancement of the physical life of people, underwear has become more and more elegant and gorgeous. However, the protrusion of the core yarns or the elastomeric yarns will spoil the quality and image of underwear. Therefore, if the problem is not solved, not only will the appearance of the underwear be affected, but its durability will also be affected, which in turn will harm the reputation of the brand and directly reduce its economic benefits.

Summary of the Invention

[0003] It is thus an object of the present invention to provide an elastic tape with minimum shrinkage, fraying or raveling, and a method of making same, in which the aforesaid shortcomings are mitigated or at least to provide a useful alternative to the public and trade.

[0004] According to a first aspect of the present invention, there is provided an elastic tape including at least a warp yarn and at least a weft yarn, characterized in that said warp yarn includes at least one elastomeric core yarn wound around by at least one thermo-fusible yarn which is adapted to melt in heat and bonded with the adjacent yarn(s).

[0005] According to a second aspect of the present invention, there is provided a method of forming an elastic tape, including the steps of (a) winding at least a thermo-fusible yarn around at least an elastomeric core yarn to form a first yarn; (b) weaving or knitting said first yarn and at least a weft yarn integrally with one another, with said first yarn as a warp yarn; and (c) heat treating said yarns to melt at least part of said thermo-fusible yarn to integrally bond with the adjacent yarn(s).

[0006] Elastic tapes according to the present invention are more advantageous than existing elastic tapes in that with the use of thermo-fusible yarns as the covering material, under heat treatment, the thermo-fusible yarns will melt and stick on other weft and warp yarns, thus producing a bonding effect. When returning to normal room temperature, the thermo-fusible yarn has been integrated with the surrounding yarns through fusing and bonding. Despite numerous stretches, no runback will happen. This invention has solved such problems as the runback or protrusion of the core yarns, meanwhile reinforcing the other materials in the tape. As a result, the elastic tape is not prone to deformation and shrinkage is reduced. The intact appearance of the apparel including the tape is assured and the service life of the clothing is extended. Such a difficult problem which perplexes the garment industry, especially the underwear industry, for a long time has thus at last been solved.

Brief Description of the Drawings

[0007]

Fig. 1 is a schematic representation of the yarn structure of a doubly covered yarn according to a first preferred embodiment of the present invention;
Fig. 2 is a schematic representation of the yarn structure of a singly covered yarn according to a second preferred embodiment of the present invention;
Fig. 3 shows the process of mechanically doubly covering the yarn as shown in Fig. 1; and
Fig. 4 shows the process of mechanically singly covering the yarn as shown in Fig. 2.

Detailed Description of the Preferred Embodiments

[0008] Shown in Fig. 1 are core yarns used for weaving an elastic tape according to a first preferred embodiment of the present invention. The core part of such a tape is an elastomeric yarn 1. The elastomeric core yarn 1 is wound by a non-thermo-fusible yarn 2 and a thermo-fusible yarn 3. The elastomeric yarn 1 may be polyurethane yarn or rubber yarn. The thermo-fusible yarn 3 may be made from polymers with a low melting point. During dyeing and finishing, when the temperature exceeds the low melting point, the thermo-fusible yarn 3 will melt and become adhesive, thus bonding the surrounding yarns together.

[0009] The covering process of the core yarns 1 is shown in Fig. 3, in which the elastomeric yarn 1 is driven on one or two rolls 4 and guided through the middle of a hollow spindle 5. The hollow spindle 5 carries the yarn 3 which covers the elastomeric yarn 1. The elastomeric yarn 1 is first wound or covered by a non-thermo-fusible

yarn 2 and then by a thermo-fusible yarn 3, and then collected in a reel 6 for use.

[0010] Such core yarns 1 covered with thermo-fusible yarns 3 are used as the warp yarn during weaving or knitting. During the dyeing and finishing process, when the temperature exceeds the melting point of the thermo-fusible yarns 3, such thermo-fusible yarns 3 will melt and fuse together with the adjacent yarns. After returning to room temperature, the thermo-fusible yarn 3 and the adjacent yarns are bonded together. Elastic tapes formed of such yarns will therefore not have the problem of elastomeric yarn runback, fraying or raveling.

[0011] In addition to using non-thermo-fusible yarn as the yarn 2, the yarn 2 may also be made of other materials such as nylon or polyester, which have the same characteristic as low melting point as the thermo-fusible yarn.

[0012] Shown in Fig. 2 is another kind of core yarns which can be used in a woven or knitted elastic woven tape according to a second preferred embodiment of the present invention. The core part is an elastic core yarn 11. The elastomeric core yarn 11 is wound by one thermo-fusible yarn 13 only. The elastomeric core yarn 11 may be a polyurethane yarn or rubber yarn. The thermo-fusible yarn 13 is made from polymers with a low melting point. During dyeing and finishing, when the temperature exceeds the melting point, the thermo-fusible yarn 13 will melt and become adhesive, and thereby to bond with the surrounding yarns. As shown in Fig. 4, the elastomeric yarn 11 is wound or covered by a thermo-fusible yarn 13 and then collected in a reel 16 for use.

[0013] It should be understood that the above only illustrates examples whereby the present invention may be carried out, and that various modifications and/or alterations may be made thereto without departing from the spirit of the invention.

[0014] It should also be understood that certain features of the invention, which are, for clarity, described in the context of separate embodiments, may be provided in combination in a single embodiment. Conversely, various features of the invention which are, for brevity, described in the context of a single embodiment, may also be provided separately or in any appropriate sub-combinations.

Claims

1. An elastic tape including at least a warp yarn and at least a weft yarn, **characterized in that** said warp yarn includes at least one elastomeric core yarn wound around by at least one thermo-fusible yarn which is adapted to melt in heat and bonded with the adjacent yarn(s).

2. A tape according to Claim 1 further **characterized in that** said elastomeric core yarn is further wound around by a non-thermo-fusible yarn.

3. A tape according to Claim 1 further **characterized in that** said elastomeric core yarn is wound around by two threads of thermo-fusible yarn.

4. A tape according to Claim 1 wherein said elastomeric core yarn is a polyurethane yarn or rubber yarn.

5. A tape according to Claim 1 wherein said thermo-fusible yarn melts in heat and becomes adhesive in the heat treatment process.

6. A method of forming an elastic tape, including the steps of:

   (a) winding at least a thermo-fusible yarn around at least an elastomeric core yarn to form a first yarn;
   (b) weaving or knitting said first yarn and at least a weft yarn integrally with one another, with said first yarn as a warp yarn; and
   (c) heat treating said yarns to melt at least part of said thermo-fusible yarn to integrally bond with the adjacent yarn(s).

7. A method according to Claim 6 further **characterized in** including a step (d) of winding a non-thermo-fusible yarn around said elastomeric core yarn.

8. A method according to Claim 6 further **characterized in** including a step (e) of winding two threads of thermo-fusible yarn around said elastomeric core yarn.

9. A method according to Claim 6 wherein said elastomeric core yarn is a polyurethane yarn or rubber yarn.

10. A method according to Claim 6 wherein said thermo-fusible yarn melts in heat and becomes adhesive in the heat treatment process.

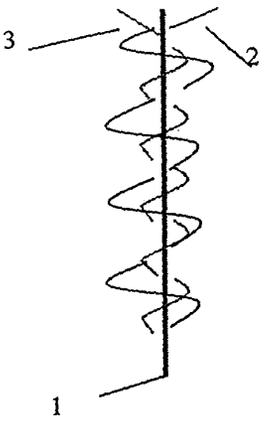

Fig. 1

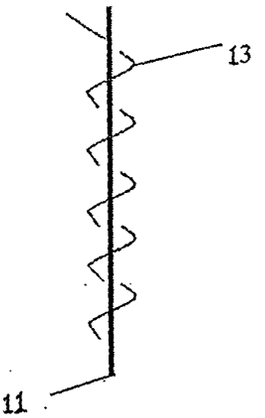

Fig. 2

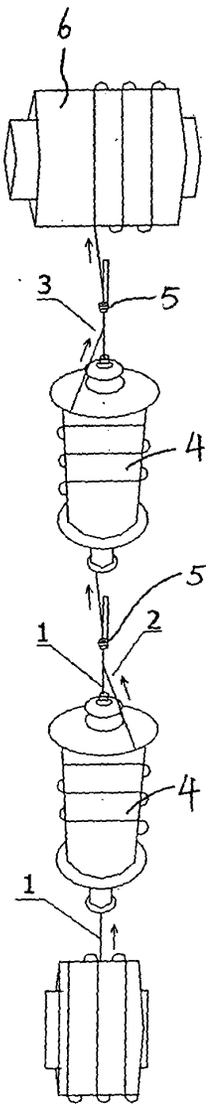

Fig. 3

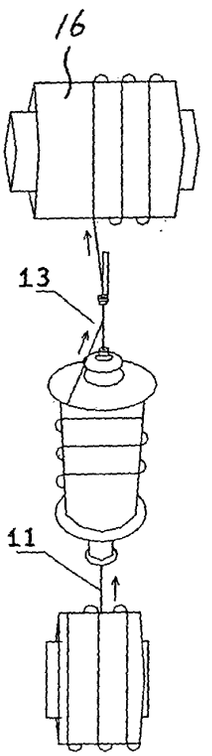

Fig. 4