

PATENT SPECIFICATION

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(54) STRINGER TAPES FOR SLIDE FASTENERS

(71) We, YOSHIDA KOGYO KABUSHIKI KAISHA, a corporation duly organized under the laws of Japan of No. 1, Kanda Izumi-cho, Chiyoda-ku, Tokyo, Japan, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

5 This invention relates to slide fasteners, more particularly to stringer tapes therefor. More specifically, the invention is directed to the provision of stringer tapes for slide fasteners suitable for use with sporting goods, bags, athletic wears and the like which require the fastener to be flexible and stretchable particularly laterally thereof.

10 Generally, there may be considered fabric tapes woven or knitted for the above purpose. Knitted tapes are susceptible to longitudinal and transverse stretch and are not suitable as they are for supporting fastener elements stably thereon. It is the usual practice therefore to reinforce such knitted tapes in a manner to suppress their tendency to stretch. Prior to this invention, there have not been proposed any knitted fabric tapes which incorporate elastic yarns in the system with a view to retaining the characteristics of lateral stretch as desired where they are applied to articles requiring flexible movement of the fastener.

15 There are known woven tapes which have elastic weft yarns laid in necessarily throughout the entire width of the tape including a marginal edge portion utilized for securing the fastener elements therealong, but such woven tapes are not adequate for the purpose of supporting the fastener elements securely in position. To overcome this difficulty, it has been proposed to apply non-elastic warp yarns at the longitudinal edge portion of a woven tape and elastic weft yarns at the remaining web portion by laying them in opposite directions. However, such woven tape has the disadvantage that it presents locally

densified and swollen areas where the two oppositely laid-in weft yarns meet together, so that the tape becomes less attractive and liable to wear in frictional contact with a slider or other objects.

The present invention aims to provide stringer tapes of a knitted structure which can be used for slide fasteners required to be flexible and stretchable when applied to the above category of articles.

According to the invention, there is provided a warp knitted stringer tape for slide fasteners which comprises pillars of stitches, a first group of elastic weft yarns laid in to connect a plurality of said pillars in the web portion of the tape, and a second group of non-elastic weft yarns laid in to connect a plurality of said pillars in a longitudinal edge portion of the tape, said first and second groups of weft yarns meeting together alternately warpwise at a borderline formed by one or more of said pillars.

The invention will now be further described by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a magnified plan view of a stringer tape embodying the invention;

Figure 2 is a similar view of a modification of Figure 1;

Figure 3 is a schematic pattern of another modification, and

Figure 4 is a plan view of the tape of Figure 1 shown as having mounted thereon interengaged rows of fastener elements.

Referring to the drawings and FIG. 1 in particular, there is shown a stringer tape 10 of a warp-knitted structure which comprises wales 11 formed by warp stitches such as open-pillar stitches, a first group of laid-in weft yarns 13 and a second group of laid-in weft yarns 14. The weft yarns in the first group 13 are core yarns made of polyurethane and other synthetic rubber filaments having an elastic property. Each of these elastic weft yarns 13 runs course-wise and connects between two adjacent wales

11 in the web portion W of the tape 10. The wales 11' in the longitudinal edge portion 15 of the tape 10 are similarly connected coursewise by the second group of weft yarns 14 which are non-elastic and non-stretchable. The second group of these non-elastic weft yarns 14 meets alternately warpwise with the first group of elastic weft yarns 13 at a borderline B defined by a predetermined wale 11a separating between the web portion W and the longitudinal edge portion W' of the tape 10. The non-elastic weft yarns 14 should be substantially equal in denier to the elastic weft yarns 13 so that the tape 10 is knitted to uniform thickness throughout. The weft yarns 14 being non-stretchable provide a rigid edge W for securing fastener elements E firmly therealong. The tape 10 is further reinforced warpwise with warp threads 12 inserted between wales 11, 11' to retain a dimensional stability in the longitudinal direction of the tape 10.

The warp-knitted tape 10 according to the invention is thus characterized by the provision of two distinct regions consisting of an elastic, stretchable web W and a non-elastic, rigid edge portion W' separated therefrom by a predetermined wale 11a defining a borderline B.

This inventive concept is embodied also in the tape structure shown in FIG. 2 which is substantially similar to the warp-knitted tape 10 described above and shown in FIG. 1 with the exception that both groups of elastic and non-elastic weft yarns 13, 14 are laid in to pass through and connect three adjacent wales 11, 11' so as to provide a wider borderline B' consisting of two wales 11b at which the two different groups of weft yarns 13, 14 meet together alternately warpwise.

The embodiment shown in FIG. 3 is substantially similar to the tape structure of FIG. 2 except in that tricot stitches 16 are utilized to substitute for reinforcing warp threads 12.

FIG. 4 illustrates a pair of tapes 10 of FIG. 1 as having mounted thereon rows of

fastener elements E which are secured by sewing threads S to their respective inner longitudinal edge portions W'. Since these edge portions W' are rigidly constructed with non-elastic yarns 14, the fastener elements E when secured thereon can retain adequate positional stability against lateral stresses which may be exerted by a slider (not shown) or by other external forces tending to pull the two tapes apart. In contrast, the remaining web portion W of the tape 10 incorporating elastic weft yarns such as of synthetic rubber filaments is allowed to flex or stretch yieldingly with the article to which it is applied as a closure.

WHAT WE CLAIM IS:—

1. a warp-knitted stringer tape for slide fasteners which comprises pillars of stitches, a first group of elastic weft yarns laid in to connect a plurality of said pillars in the web portion of the tape, and a second group of non-elastic weft yarns laid in to connect a plurality of said pillars in a longitudinal edge portion of the tape, said first and second groups of weft yarns meeting together alternately warpwise at a borderline formed by one or more of said pillars.

2. A warp-knitted stringer tape according to Claim 1, wherein said borderline is formed by a plurality of pillars.

3. A warp-knitted stringer tape according to Claim 1 or Claim 2 wherein said elastic weft yarns are substantially equal in denier to said non-elastic weft yarns.

4. A warp-knitted stringer tape according to any preceding Claim wherein reinforcing warp threads are provided between said pillars.

5. A warp-knitted stringer tape according to any one of Claims 1 to 3, wherein said wales are also linked by tricot stitches.

6. A warp-knitted stringer tape substantially as herein described with reference to the accompanying drawings.

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