

Description

This invention relates generally to hook and loop fasteners and has particular reference to a stretchable warp-knit loop-carrying support tape engageable with a mating hook-carrying support tape.

Certain prior art tapes for hook and loop fasteners have been proposed that are stretchable in the longitudinal direction. To the knowledge of the present inventor, however, there is no satisfactory prior art which teaches producing economically and efficiently a warp-knit tape which is stretchable longitudinally as desired for application to hook and loop fasteners.

Japanese Patent Publication JP-B1-55-38121 discloses a woven tape for hook and loop fastener which incorporates an elastic yarn to render the tape stretchable as shown in Figure 6 of the accompanying drawings. Such prior art stretchable tapes are in the form of a relatively narrow strip, and attempts to make stretchable hook and loop fastener tapes of sufficient width from woven material have involved considerable manufacturing problems.

The present invention seeks to provide a stretchable support tape for hook and loop fasteners which can be produced highly economically and efficiently.

The present invention further seeks to provide a stretchable support tape which plays the loop part of a hook and loop fastener and which is formed by warp-knitting to increased width.

These and other objects and features of the invention will be better understood from the following detailed description taken in conjunction with the accompanying drawings in which like reference numerals refer to like parts throughout the several views.

According to the present invention, there is provided a stretchable warp-knit support tape for hook and loop fasteners which comprises a pile portion constructed with tricot stitches and single cord stitches, both stitches being formed of crimped yarns and chain stitches formed into pile-loops, and warp members of an elastic material laid in warpwise by idle swing.

Figure 1 is a schematic diagram illustrating the construction of a warp-knit support tape embodying the invention;

Figures 2a-2d inclusive are diagrammatic representations of the various stitches incorporated in the support tape of Figure 1;

Figure 3 is a cross-sectional view of the support tape of Figure 1;

Figure 4 is a view similar to Figure 3 but showing the tape after being treated;

Figure 5 is a view similar to Figure 4 but showing the tape in confronting relation to its mating hook part of a hook and loop fastener; and

Figure 6 is a schematic representation on enlarged scale of a prior art woven support tape for hook and loop fasteners.

Referring now to the drawings and Figure 1 in particular, there is shown a preferred form of a warp-

knit support tape 10 to be used as a loop or female part of a hook and loop fastener. The support tape 10 consists of a pile portion 11 and selvage portions 12 and 13 extending warpwise on opposite sides of the pile portion 11.

The pile portion 11 of the tape 10 is constructed with tricot stitches 14, single cord stitches 15, both stitches being interlaced to make up a foundation of the tape 10, and chain stitches 16 which form a multiplicity of pile-loops 17. For the tape 10 to be stretchable, the tricot stitches 14 and the single cord stitches 15 are crimped by suitable treatment.

The tricot stitches 14 are of Link No. 1-2/1-0/1-2/1-0 or 2-3/1-0/2-3/1-0, and the single cord stitches 15 are of Link No. 0-1/4-3/0-1/4-3, as shown in Figures 2b and 2c, respectively.

The chain stitch 16 is of an open lap and represented by Link No. 1-0/0-0/0-1/1-1 or 1-0/0-0/0-0/0-1/1-1, as shown in Figure 2a, and threads therefor are positively overfed beyond the normal rate of feed of threads for the remaining stitches and formed by sinker looping into pile-loops 17 extending over every other course. The pile-loops 17 are arranged to extend longitudinally of the tape 10 alternately along the right and left sides of wales 18 as shown in Figure 3, whereby increased opportunity is provided for the loops 17 to engage the hooks 19 on the mating tape as shown in Figure 5.

The chain stitches 16 forming the pile-loops 17 are made of multifilamentary threads which may be also crimped.

Designated at 20 is a warp member made of a covered yarn such as synthetic rubber yarn, Spandex yarn or other elastic yarn which is laid in by idle swing and has Link No. 0-0/1-1/0-0/1-1 or 0-0/2-2/0-0/2-2 as shown in Figure 2d. The warp member 20 is knitted in place while being stretched and is allowed to shrink when removed from the knitting machine, and it may be laid in over each wale or over every other or more wales depending upon the construction and extent of stretch of the tape 10 desired.

The selvages 12 and 13 extended over three wales 18 on opposite sides of the tape 10 as shown in Figure 1 and are constructed with the same knit threads as the pile portion 11 except for the absence of pile-loops 17. The inclusion of warp members 20 enhances stretchability of the tape 10 particularly in the longitudinal direction which is preferably from 1.5 to 2 times.

Figure 4 shows the loop-carrying or female support tape 10 after being finished. This finishing treatment includes heat-setting, dying, brushing and coating. Brushing is done to comb up and separate the pile-loop 17 into filamentary condition so as to facilitate their engagement with the hooks 19 on the male support tape 10' as shown in Figure 5.

The tape 10 is coated underside with a suitable elastic material 21 to anchor the pile-loops 17 in place against dislocation from the web of the tape 10, the elastic material 21 being silicone rubber, polyurethane foam, other elastic rubber or resin materials.

As will appear apparent to one skilled in the art, the tape 10 is sewn or otherwise attached along the selvages 12 and 13 onto a garment article.



Claims

1. Stretchable warp-knit support tape (10) for hook and loop fasteners which comprises a pile portion (11) constructed with tricot stitches (14) and single cord stitches (15), both stitches being formed of crimped yarns and chain stitches (16) formed into pile-loops (17), and warp members (20) of an elastic material laid in warpwise by idle swing. 5
2. Stretchable warp-knit support tape according to claim 1, wherein said tape (10) is coated underside with an elastic coating (21). 10
3. Stretchable warp-knit support tape according to claim 1, wherein said chain stitches (16) are formed of multifilamentary yarns. 15
4. Stretchable warp-knit support tape according to claim 1, said tape (10) being finished by brushing to comb up and separate said pile-loops (17) into filamentary condition. 20

Patentansprüche

1. Dehnbares kettengewirktes Tragband (10) für Flächenreißverschlüsse, umfassend einen Polbereich (11), der aus Trikotmaschen (14) und offenen Satinmaschen (15), wobei beide Maschen aus Kräuselgarn gebildet sind, und aus offenen Fransenmaschen (16), die Polschlaufen (17) bilden, und aus Schußfäden (20) aus einem elastischen Material, die in Schußrichtung 25
2. Dehnbares kettengewirktes Tragband nach Anspruch 1, wobei das Tragband (10) auf der Unterseite mit einer elastischen Beschichtung (21) beschichtet ist. 30
3. Dehnbares kettengewirktes Tragband nach Anspruch 1, wobei die offenen Fransen (16) aus Multifilamentgarnen gebildet sind. 35
4. Dehnbares kettengewirktes Tragband nach Anspruch 1, wobei das Tragband (10) durch Bürsten endbearbeitet ist, um die Polschlaufen (17) in einen filamentartigen Zustand zu kämmen und zu trennen. 40

Revendications

1. Ruban support tricoté-chaîne étirable (10) pour fermetures à crochets et boucles, comprenant: une partie poils (11) réalisée avec des mailles (14) de tricot demi-simple fermé, des mailles (15) de satin ouvert, ces deux sortes de mailles étant constituées de fils crêpés, des mailles (16) de chaînette ouverte formant des boucles (17) de poils, et une trame partielle (20) en matière élastique, insérée dans le sens de la chaîne par un mouvement oscillant libre. 45
2. Ruban support tricoté-chaîne étirable selon la revendication 1, dans lequel le ruban (10) est recouvert d'un revêtement élastique (21) sur son envers. 50
3. Ruban support tricoté-chaîne étirable selon la revendication 1, dans lequel les mailles de chaînette (16) sont formées par des fils multifilaments. 55
4. Ruban support tricoté-chaîne étirable selon la revendication 1, le ruban (10) étant soumis à une finition par brossage pour houpper et séparer les boucles (17) de poils afin de leur donner un état filamenteux. 60