

PATENT SPECIFICATION (11)

1 495 712

1 495 712

- (21) Application No. 51552/74 (22) Filed 28 Nov. 1974 (19)
 (31) Convention Application No. 48/138 596 (32) Filed 30 Nov. 1973 in
 (33) Japan (JA)
 (44) Complete Specification published 21 Dec. 1977
 (51) INT. CL.² D04B 21/20
 (52) Index at acceptance
 D1K 24A10 24A11 24A6 24B2



(54) A WARP-KNITTED TAPE FOR SLIDING CLASP FASTENER

(71) We, YOSHIDA KOGYO K.K., a corporation duly organized under the laws of Japan and existing at No. 1, Kanda Izumicho, 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:—

This invention relates to a carrier tape for sliding clasp fastener and has particular reference to a warp-knitted tape for mounting thereon a row of interlocking fastener elements.

Attempts have heretofore been made to provide warp-knitted fastener tapes capable of mounting rows of fastener elements securely in position against displacement, for which purpose the marginal edge portion of the tape has been strengthened with rather complicated knit patterns. This has led to the drawback that when sewing the fastener elements to the tape, the sewing needle tends to slip out of the correct line on account of resistance of too densely knitted threads, resulting in misaligned rows of fastener elements on the tape. Furthermore, the knit structure of the borderline between the web and the edge portion has been rendered somewhat irregular and frail so that the tape was liable to wear at the region which is disposed in frictional contact with a slider.

According to the invention, there is provided a warp-knitted tape for a sliding clasp fastener comprising a web portion and a marginal edge portion extending longitudinally of the tape, said web portion including chain stitches that form wales, tricot stitches interknitted therewith and extending across two or more adjacent wales, and inlaid lapping threads each laid over and across a plurality of wales and each arranged to wrap around a location where a said chain stitch and a said tricot stitch are interknitted in each course, and said marginal edge portion including chain stitches that form a first wale and a second wale and an inlaid lapping thread laid over and across said first and second wales and some adjacent wales, said first and second wales not being con-

nected by tricot stitches to provide an interwale groove greater in width than each of the grooves in the web portion, said second wale and a plurality of adjacent wales in the web portion being held together to provide therebetween interwale grooves narrower than the remaining interwale grooves in the web portion, the inlaid lapping thread laid over and across said first and second wales and some adjacent wales being either a plurality of threads bundled together or thicker than the other inlaid lapping threads.

The invention will be described by way of example with reference to the accompanying drawings illustrating by way of example a preferred embodiment which the invention may assume in practice.

Figure 1 diagrammatically illustrates the construction of a preferred warp-knitted carrier tape according to the invention; and

Figure 2 is a transverse cross-sectional view of the same with a row of fastener elements mounted thereon together with a slider.

Referring now to Figure 1, there is shown a carrier tape of a warp-knit structure for sliding clasp fasteners, which tape generally designated by the reference numeral 10 comprises a web portion 11 and a marginal edge portion 12 extending longitudinally thereof. The web portion 11 is constructed with chain stitches 13, which form longitudinally extending wales W, and tricot stitches 14 that run across two adjacent wales. Laid in this foundation structure are lapping threads 17 each laid over and across a predetermined number of wales W, e.g. every four wales as in the illustrated embodiment and each arranged to wrap around a location where a chain stitch 13 and a tricot stitch 14 are interknitted in each course. There are also provided warp threads 18 which are arranged to extend meanderingly along the wales W so as to close the open laps of the respective wales W.

The marginal edge portion 12 of the tape 10 to which the fastener elements E (Figure 2) are to be attached is comprised of chain stitches 19 and 20 forming a first wale W₁ and a second wale W₂, respectively.

The first wale W_1 located at an innermost edge of the tape and the second wale W_2 lying adjacent thereto are spaced apart to provide therebetween an interwale groove G_1 greater in width than the grooves G_n in the web portion 11. By reason of the provision of this wider interwale groove G_1 , a sewing machine needle (not shown) can run straight along a correct line of path, without slippage, to produce stitching 21 that secures the fastener elements E into properly aligned position on the tape 10. The chain stitches 19 and 20 of wales W_1 and W_2 in the marginal edge portion 12 are preferably formed of thicker yarns than the chain stitches of the other wales in the web portion 11.

It will be seen that the first wale W_1 , second wale W_2 , third wale W_3 and fourth wale W_4 are interconnected by an inlaid lapping thread 17¹ which is either (as shown) two threads bundled together or is thicker than the other inlaid lapping threads.

Under the influence of the lapping action of the inlaid lapping thread 17¹ and the tension of the tricot stitches 14, the wales W_2 , W_3 and W_4 are held closely together so that the interwale grooves G_2 and G_3 therebetween are narrower than the remaining grooves G in the web portion 11. This process is facilitated by the absence of tricot stitches between the wales W_1 and W_2 . This can provide a relatively rigid tape portion 22 which is defined by the three wales W_2 , W_3 and W_4 pulled together and which therefore exhibits high resistance to wear when subjected to frictional contact with a reciprocating slider.

Along the wales W_1 and W_2 of the marginal edge portion 12 are also arranged warp threads 18a and 18b similar to those interknitted in the web portion 11 of the tape.

Designated at 23 is a connection thread adapted to connect adjacent unit tapes widthwise that are produced in parallel, which connection thread may be removed to separate the tapes to individual product lengths in a manner well known in the art. The connecting thread 23 urges the first wale W_1 towards the left-hand side as viewed in the drawings and at the same time, the wale W_1 is pulled towards the right by the lapping threads 17¹, the two tensions in opposite directions cancelling each other out to retain the wale W_1 in position away from the adjacent wale W_2 . It will be noted that the wale W_4 in the web portion 11 of the tape 10 is also retained in position against displacement by the tensions of both inlaid lapping threads 17 and 17¹ that work in opposite directions to cancel each other out.

The second wale W_2 , due to the absence of tricot or other stitches spanning between this wale and the first wale W_1 , is pulled towards the right-hand side of the drawings by the tensions of the inlaid lapping threads

17 and tricot stitches 14 and so biased together with the adjoining third wale W_3 towards the fourth wale W_4 , whereby the interwale groove G_1 between the first and second wales W_1 , W_2 is rendered wider than the remaining grooves G_n in the web portion 11.

Referring now to Figure 2, there is shown an example of the manner in which a row of fastener elements E is attached to the tape 10 provided in accordance with the invention. The fastener elements E with a core member 24 inserted therethrough are mounted on the marginal edge portion 12 of the tape 10 and secured in position by stitching 21 that runs through the legs Ea, Eb, of the fastener elements E. The sewing stitches 21 are securely anchored in the wide groove G_1 against lateral displacement, thereby ensuring high positional stability of the fastener elements E.

Having thus described the invention, it will be understood that various changes and modifications may be made in the specific form and construction herein advanced, without departing from the scope of the appended claims.

WHAT WE CLAIM IS:—

1. A warp-knitted tape for a sliding clasp fastener comprising a web portion and a marginal edge portion extending longitudinally of the tape, said web portion including chain stitches that form wales, tricot stitches interknitted therewith and extending across two or more adjacent wales, and inlaid lapping threads each laid over and across a plurality of wales and each arranged to wrap around a location where a said chain stitch and a said tricot stitch are interknitted in each course, and said marginal edge portion including chain stitches that form a first wale and a second wale and an inlaid lapping thread laid over and across said first and second wales and some adjacent wales, said first and second wales not being connected by tricot stitches to provide an interwale groove greater in width than each of the grooves in the web portion, said second wale and a plurality of adjacent wales in the web portion being held together to provide therebetween interwale grooves narrower than the remaining interwale grooves in the web portion, the inlaid lapping thread laid over and across said first and second wales and some adjacent wales being either a plurality of threads bundled together or thicker than the other inlaid lapping threads.

2. A warp-knitted tape as claimed in Claim 1 wherein said web portion and said marginal edge portion include warp threads extending along the wales in a direction to close open laps of the wales.

3. A warp-knitted tape as claimed in claim 1 or 2 wherein said chain stitches are



1,495,712

2
9

The first wale W_1 located at an innermost edge of the tape and the second wale W_2 lying adjacent thereto are spaced apart to provide therebetween an interwale groove G_1 greater in width than the grooves G_a in the web portion 11. By reason of the provision of this wider interwale groove G_1 , a sewing machine needle (not shown) can run straight along a correct line of path, without slippage, to produce stitching 21 that secures the fastener elements E into properly aligned position on the tape 10. The chain stitches 19 and 20 of wales W_1 and W_2 in the marginal edge portion 12 are preferably formed of thicker yarns than the chain stitches of the other wales in the web portion 11.

It will be seen that the first wale W_1 , second wale W_2 , third wale W_3 and fourth wale W_4 are interconnected by an inlaid lapping thread 17¹ which is either (as shown) two threads bundled together or is thicker than the other inlaid lapping threads.

Under the influence of the lapping action of the inlaid lapping thread 17¹ and the tension of the tricot stitches 14, the wales W_2 , W_3 and W_4 are held closely together so that the interwale grooves G_2 and G_3 therebetween are narrower than the remaining grooves G in the web portion 11. This process is facilitated by the absence of tricot stitches between the wales W_1 and W_2 . This can provide a relatively rigid tape portion 22 which is defined by the three wales W_2 , W_3 and W_4 pulled together and which therefore exhibits high resistance to wear when subjected to frictional contact with a reciprocating slider.

Along the wales W_1 and W_2 of the marginal edge portion 12 are also arranged warp threads 18a and 18b similar to those interknitted in the web portion 11 of the tape.

Designated at 23 is a connection thread adapted to connect adjacent unit tapes widthwise that are produced in parallel, which connection thread may be removed to separate the tapes to individual product lengths in a manner well known in the art. The connecting thread 23 urges the first wale W_1 towards the left-hand side as viewed in the drawings and at the same time, the wale W_1 is pulled towards the right by the lapping threads 17¹, the two tensions in opposite directions cancelling each other out to retain the wale W_1 in position away from the adjacent wale W_2 . It will be noted that the wale W_4 in the web portion 11 of the tape 10 is also retained in position against displacement by the tensions of both inlaid lapping threads 17 and 17¹ that work in opposite directions to cancel each other out.

The second wale W_2 , due to the absence of tricot or other stitches spanning between this wale and the first wale W_1 , is pulled towards the right-hand side of the drawings by the tensions of the inlaid lapping threads

17 and tricot stitches 14 and so biased together with the adjoining third wale W_3 towards the fourth wale W_4 , whereby the interwale groove G_1 between the first and second wales W_1 , W_2 is rendered wider than the remaining grooves G_a in the web portion 11.

Referring now to Figure 2, there is shown an example of the manner in which a row of fastener elements E is attached to the tape 10 provided in accordance with the invention. The fastener elements E with a core member 24 inserted therethrough are mounted on the marginal edge portion 12 of the tape 10 and secured in position by stitching 21 that runs through the legs Ea, Eb, of the fastener elements E. The sewing stitches 21 are securely anchored in the wide groove G_1 against lateral displacement, thereby ensuring high positional stability of the fastener elements E.

Having thus described the invention, it will be understood that various changes and modifications may be made in the specific form and construction herein advanced, without departing from the scope of the appended claims.

WHAT WE CLAIM IS:—

1. A warp-knitted tape for a sliding clasp fastener comprising a web portion and a marginal edge portion extending longitudinally of the tape, said web portion including chain stitches that form wales, tricot stitches interknitted therewith and extending across two or more adjacent wales, and inlaid lapping threads each laid over and across a plurality of wales and each arranged to wrap around a location where a said chain stitch and a said tricot stitch are interknitted in each course, and said marginal edge portion including chain stitches that form a first wale and a second wale and an inlaid lapping thread laid over and across said first and second wales and some adjacent wales, said first and second wales not being connected by tricot stitches to provide an interwale groove greater in width than each of the grooves in the web portion, said second wale and a plurality of adjacent wales in the web portion being held together to provide therebetween interwale grooves narrower than the remaining interwale grooves in the web portion, the inlaid lapping thread laid over and across said first and second wales and some adjacent wales being either a plurality of threads bundled together or thicker than the other inlaid lapping threads.

2. A warp-knitted tape as claimed in Claim 1 wherein said web portion and said marginal edge portion include warp threads extending along the wales in a direction to close open laps of the wales.

3. A warp-knitted tape as claimed in claim 1 or 2 wherein said chain stitches are

thicker in the marginal edge portion than in the web portion.

4. A warp-knitted tape as claimed in claim 1, 2 or 3 wherein one of said inlaid lapping threads interconnects said first and second wales of the marginal edge portion and at least one adjacent wale of the web portion and is thicker than the other inlaid lapping threads.
5. A warp-knitted tape as claimed in claim 1, 2 or 3 wherein one of said inlaid lapping threads interconnects said first and

second wales of the marginal edge portion and at least one adjacent wale of the web portion and is a plurality of threads bundled together.

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

MARKS & CLERK,
Chartered Patent Agents,
57—60 Lincolns Inn Fields,
London, WC2A 3LS.
Agents for the Applicants.

Printed for Her Majesty's Stationery Office by Burgess & Son (Abingdon), Ltd.—1977.
Published at The Patent Office, 25 Southampton Buildings, London, WC2A 1AY,
from which copies may be obtained.



* C L N S *