

Description

The present invention relates to a method of and apparatus for manufacturing a woven slide fastener stringer having a row of continuous filamentary coupling elements woven integrally into a stringer tape, and an article procured by such method and apparatus. More particularly, the invention is directed to the provision of a woven slide fastener stringer having such a row of coupling elements which are disposed so as to be concealed or masked from external view when the slide fastener is closed.

EP-A-0 124 129, which forms the basis of the preamble of claims 1 and 2, discloses a method of manufacturing a woven slide fastener stringer in which a single weft thread is introduced into the fell of the tape from one longitudinal thereof and an element-forming filamentary material is introduced into the fell from the opposite longitudinal edge of the tape. However, such prior art method and apparatus are not suitable for forming a woven slide fastener stringer of a concealed type with a row of coupling elements arranged to be concealed from view in a manner contemplated by the invention.

A concealed type of woven slide fastener is known from US-A-3 961 652. This document discloses a woven slide fastener stringer in which a row of continuous filamentary coupling elements is woven in such a way that the head portion of each of the elements is directed toward the web portion of the stringer tape and the heel portion of the element is oriented to project transversely beyond the longitudinal edge of the tape. However, US patent 3 961 652 fails to teach how to introduce the single weft thread and the element-forming filamentary material into the fell of the stringer tape.

The present invention seeks to provide a method of manufacturing a woven slide fastener stringer having a row of continuous filamentary coupling elements woven into a stringer tape along one longitudinal edge thereof in such a manner that the row of coupling elements when interengaged with a corresponding row of coupling elements on an opposite mating stringer is completely concealed from view and firmly secured in place against the influence of lateral pull or vertical thrust exerted to the stringer.

The present invention further seeks to provide an apparatus for reducing such method to practice, which is simple in construction and easy in maintenance.

According to a first aspect of the invention, there is provided a method of manufacturing a woven slide fastener stringer, comprising

(a) weaving a stringer tape with a group of foundation warp threads, a group of fixing warp threads and a single weft thread progressively at

a fell, said foundation warp threads and said weft thread jointly constituting a web portion of said tape and said fixing warp threads extending along one longitudinal edge of said tape;

(b) forming upper and lower sheds between said groups of warp threads;

(c) inserting said weft thread in said upper shed and introducing an element-forming filamentary material in said lower shed along a path extending substantially parallel to said warp threads; and

(d) coiling said element-forming filamentary material into a row of coupling elements each having a coupling head portion, substantially superimposed upper and lower leg portions and a heel portion as said filamentary material is woven into said stringer tape along said one longitudinal edge thereof in synchronism with the weaving of said stringer tape, whereby said coupling steps include hooking said element forming filamentary material, characterized in that said weft thread and said element forming filamentary material are both inserted in said upper and lower shed, respectively, from said one longitudinal edge of said tape; and that said hooking of said element forming filamentary material is carried out between said foundation warp threads and said fixing warp threads, said heel portion being oriented to project transversely beyond said one longitudinal edge of said stringer tape and said head portion being directed toward said web portion of said stringer tape.

According to a second aspect of the invention, there is provided an apparatus for manufacturing a woven slide fastener stringer, comprising

(a) a loom for weaving a stringer tape of foundation warp threads, fixing warp threads and a single weft thread progressively at a fell, said foundation warp threads and said weft thread jointly constituting a web portion of said tape, and said fixing warp threads extending along one longitudinal edge of said tape, said loom including

(1) a reed having guide slots for the passage therethrough of said foundation warp threads and adapted to beat said foundation weft threads against said fell,

(2) an element-shaping plate secured to and movable with said reed toward and away from said fell, said element-shaping plate extending in parallel alignment with said guide slots and in between said fixing warp threads, (3) means forming upper and lower sheds for selectively moving said warp threads up and down,

(4) a first filling carrier disposed at said one longitudinal edge of said stringer tape and reciprocable for instructing said weft thread in

said upper shed into engagement with said warp threads,

(5) a second filling carrier disposed in parallel spaced relation to said first filling carrier and reciprocable for introducing an element-forming filamentary material in said lower shed,

(b) a coiling means operable in synchronism with said loom for coiling said element-forming filamentary material into a row of coupling elements each having a coupling head portion, upper and lower leg portions and a heel portion, whereby the row of coupling elements are woven into said stringer tape as the latter is woven, said coiling means including a hook disposed at said one longitudinal edge of said stringer tape and movable in a plane perpendicular to the general plane of said stringer tape between a first position located in alignment with said fell and a second position remote from said fell, characterized in that said second filling carrier is also disposed at the said one longitudinal edge of said stringer tape, and that said hook is disposed between said foundation warp threads and said fixing warp threads, said hook during movement between said first and second positions causing each of said coupling elements to lie with said heel portion oriented to project transversely beyond said one longitudinal edge of said stringer tape and with said coupling head portion directed toward said web portion of said stringer tape.

The invention is as claimed in Claims 1-6, and will be explained herein below in more detail having regard to the accompanying drawings, wherein:

Figures 1 and 2 are schematic perspective views of an apparatus according to the present invention, the views showing parts in different positions while the apparatus is in operation to produce a woven slide fastener stringer;

Figure 3 is an enlarged perspective view of a portion of the apparatus shown in Figure 2;

Figure 4 is an enlarged perspective view of a portion of an exemplary slide fastener stringer produced by the apparatus of Figure 1;

Figure 5 is a diagrammatic transverse cross-sectional view of the stringer of Figure 4.

Figures 1 and 2 illustrate an apparatus for manufacturing a woven slide fastener stringer in accordance with the present invention. The apparatus comprises a loom 10 for progressively weaving a stringer tape 11 of warp threads 12, 13, 14, 15 at a fell 16, the loom 10 including conventional heddles or a shedding means not shown for forming a pair of upper and lower warp sheds 17, 18 between the warp threads 12, 13, 14, 15 and for selectively moving the warp threads 12 - 15 up and down, a first filling carrier or weft inserter 19 disposed at one longitudinal edge of the warp threads 12 - 15

and reciprocally movable across the upper shed 17 for inserting a weft thread 20 in double picks in the upper warp shed 17 between the warp threads 12 - 15 and a second filling carrier 21 disposed in parallel spaced relation to the first carrier 19 and reciprocally movable for inserting an element-forming filamentary material of synthetic resin 22 in the lower shed 18 between the warp threads 14, 15 woven along one longitudinal edge 11a of the stringer tape 11. The apparatus includes a reed 23 movable back and forth for beating the weft thread 20 inserted in the shed 17 against the fell 16, and a knitting needle 24 reciprocally disposed at the opposite edge of the warp threads 12 - 15 for successively knitting loops of the weft thread 20 projecting out the warp shed 17 to form a tape selvage. The reed 23 has a plurality of longitudinal guide slots 23a through which the warp threads 12, 13 extend to the fell 16.

The element-forming filamentary material of synthetic resin 22, which has a plurality of prospective coupling head portions 25a (Figures 1 and 2) formed in advance thereon at equal intervals, is introduced in the lower warp shed 18 to the fell 16 through a feed tube 54 extending substantially parallel to the warp threads 12 - 15.

The apparatus also includes a coiling means operable in synchronism with the loom 10 for coiling the element-forming filamentary material 22 into a row of coupling elements 25 whereby the row of coupling elements 25 is woven integrally into the stringer tape 11 as the latter is woven. The coiling means comprises a rocker arm 26 disposed at the one edge of the warp threads 12 - 15 and rockingly movable about one of its ends. As better shown in Figure 3, the rocker arm 26 has at the opposite or distal end a hook 27 including a head portion 27a and a nose portion 27b extending therefrom in a direction parallel to the warp threads 12 - 15. The nose portion 27b has a transverse cross section which defines a space between a pair of upper and lower legs 28, 29 of each coupling element 25. The rocker arm 26 has a slanted surface 30 contiguous to the head portion 27a to enable the filamentary material 22 to slide smoothly thereon and over the nose portion 27b when the filamentary material 22 is brought by the second carrier 21 into hooked engagement with the hook 27 in a manner hereafter to be described. Upon rocking movement of the rocker arm 26, the hook 27 moves, in a plane substantially perpendicular to the general plane of the stringer tape 11, between a first position shown in Figures 2 and 3 in which it is located in alignment with the fell 16 and a second position shown in Figure 1 in which it is located remotely from the fell 16.

The coiling means also includes an element-shaping plate 31 removably secured to and mov-

able with the reed 23 toward and away from the fell 16. The element-shaping plate 31 has a straight longitudinal punch edge 31a extending in parallel alignment with the slots 23a of the reed 23 and in between the group of warp threads 14 and 15 and adapted to beat the filamentary material 22 against the fell 16, as shown in Figures 2 and 3 and recessed as at 31b to preclude the danger of interference with the rocker arm 26. The element-shaping plate 31 may be adjusted, by suitable means such as bolts and nuts, in position relative to the reed 23, or may be replaced as and when it becomes worn on repeated frictional contact with the resinous filamentary material 22.

The second carrier 21 has a bifurcated end portion 21a for receiving therein the element-forming filamentary material 22 having the equidistantly spaced prospective coupling head portions 25a (better shown in Figures 4 and 5). The second carrier 21 is actuated in timed relation to the rocker arm 26 so that while the hook 27 is at its second position shown in Figure 1, the bifurcated end portion 21a of the carrier 21 engages the element-forming filamentary material 22 and carries the same over the slanted surface 30 and the hook's head portion 27a into engagement with the nose portion 27b.

The apparatus thus constructed operates with a cycle of operation which for purpose of illustration begins under the conditions shown in Figure 1 in which the element-forming filamentary material 22 is displaced by the second carrier 21 beyond the warp threads 14, 15 into hooked engagement with the hook 27; the weft thread 20 inserted or laid in by the first carrier 19 through the upper warp shed 17 is ready for hooked engagement with the knitting needle 24; and the reed 23 is retracted in a position away from the fell 16 of the stringer tape 11 being woven. Then, the rocker arm 26 is actuated to move angularly toward the fell 16 whereupon the hook 27 moves from the second position of Figure 1 to the first position of Figures 2 and 3. At the same time, the reed 23 is actuated to move forward to beat the weft thread 20 just inserted against the fell 16 and the element-shaping plate 31 likewise moves forward in between the warp threads 14, 15 to beat the filamentary material 22 against the fell 16 along the longitudinal edge 11a of the tape 11. During that time, the element-forming filamentary material 22 is coiled around the hook's nose portion 27b substantially in parallel relation to the fell 16 to thereby form a coupling element 25.

Thereafter, while the rocker arm 26 and hence the hook 27 is at rest at the first position shown in Figures 2 and 3, the reed 23 is retracted together with the element-shaping plate 31 away from the fell 16, then the heddle not shown is actuated to

move the warp threads 12 - 15 up and down across the warp sheds 17, 18, and the first carrier 19 is again actuated to insert the weft thread 20 in the upper warp shed 17. After the reed 23 has beaten the weft thread 20 just inserted against the fell 16, the rocker arm 26 moves angularly away from the fell 16 to bring the hook 27 into the second position shown in Figure 1. Simultaneously therewith, the reed 23 and the plate 31 are moved back again to their retracted position. Finally, the heddle is actuated to change the respective positions of the warp threads 12 - 15 into those shown in Figure 1, to thereby complete a cycle of operation of the apparatus.

Figures 4 - 7 show an example of woven slide fastener stringer 33 produced by the apparatus of the present invention. The slide fastener stringer 33 comprises a row of coiled coupling elements 34 formed of synthetic resin fixed to a slide fastener stringer tape 35 woven of foundation warp threads 36 and a single foundation weft thread 37, the row of coupling elements 34 extending along a longitudinal edge portion 38 of the stringer tape 35. The foundation warp threads 36 and the foundation weft thread 37 jointly constitute a web portion 39 of the stringer tape 35. The row of coupling elements 34 is secured to one longitudinal edge portion 38 of the stringer tape 35 by means of a fixing warp thread system including a plurality of clamping warp threads 40a, 41a, 42a, 40b, 41b, 42b and a plurality of upper and lower binding warp threads 43a, 44a, 45a, 43b, 44b, 45b.

Each of the coupling elements 34 comprises a coupling head 47 and a pair of upper and lower legs 48, 49 extending from the coupling head 47 in a common direction and spaced from each other vertically in a direction substantially perpendicular to the general plane of the stringer tape 35. The upper and lower legs 48, 49 are merged into and interconnected by a heel portion 50 located remotely from the coupling head 47.

According to an important aspect of the invention, the heel portion 50 is oriented to project transversely beyond the longitudinal edge portion 38 of the tape 35, while the coupling head 47 is directed toward the web portion 39 of the tape 35.

The upper and lower binding warp threads 43a - 45a and 43b - 45b extend substantially in a straight run over the upper and lower legs 48 and 49, respectively of the coupling elements 34 so as to provide enhanced positional stability of the elements 34 in the longitudinal direction of the stringer 33. The binding warp threads 43a - 45a and 43b - 45b intersect the weft thread 37 in between adjacent coupling elements 34 as shown in Figure 4. The clamping warp threads 40a - 41a, 42a, 40b, 41b, 42b are adapted to bring both legs 48, 49 of the elements 34 closely together.

The foundation weft thread 37 passes around the last upper warp binding thread 45a up toward and around the last lower warp binding thread 45b to form a straight run or span 51 therebetween adjacent the coupling head 47 of the element 34 which extends substantially perpendicularly with respect to the general plane of the stringer tape 35. The straight span 51 of the weft thread 37 defines an axis about which the stringer tape 35 is folded back so that the coupling head portion 47 of each coupling element 34 now projects transversely beyond the longitudinal edge portion 38 of the tape 35, while the heel portion 50 of the element 34 is concealed from view by the web portion 39 of the tape 35 which has been turned over to overlie the heel portion 50 as shown in Figures 6 and 7. A portion of the weft thread 37 inserted in double picks, which is interlaced with the foundation warp threads 36 in the region of the straight span 51, forms an abutment 52 transversely projecting toward the coupling head 47 of the element 34. The abutment 52 on one of a pair of stringers 33 is brought into abutting engagement with that on the other of the paired stringers 33 when the two stringers 33 are coupled together in a well known manner by a slider not shown. The abutments 52 thus effectively conceal the row of coupling elements 34 from view and can remain joined together against lateral pull or vertical thrust by the fixing warp thread system described herein which holds the coupling elements 34 firmly in place with the upper and lower legs 48, 49 of the respective elements 34 substantially superimposed one upon another to lie substantially perpendicular to the general plane of the stringer 33 and flattened to assume a relatively low profile as shown in Figures 5 - 7.

Claims

1. A method of manufacturing a woven slide fastener stringer, comprising the steps of:

- (a) weaving a stringer tape (11) with a group of foundation warp threads (12, 13), a group of fixing warp threads (14, 15) and a single weft thread (20) progressively at a fell (16), said foundation warp threads (12, 13) and said weft thread (20) jointly constituting a web portion (39) of said tape (11) and said fixing warp threads (14, 15) extending along one longitudinal edge (11a) of said tape;
- (b) forming upper and lower sheds (17, 18) between said groups of warp threads;
- (c) inserting said weft thread (20) in said upper shed (17) and introducing an element-forming filamentary material (22) in said lower shed (18) along a path extending substantially parallel to said warp threads

(12 - 15); and

(d) coiling said element-forming filamentary material (22) into a row of coupling elements (25) each having a coupling head portion (25a), substantially superimposed upper and lower leg portions (28, 29) and a heel portion (50) as said filamentary material (22) is woven into said stringer tape (11) along said one longitudinal edge (11a) thereof in synchronism with the weaving of said stringer tape (11), whereby said coiling steps includes hooking said element-forming filamentary material (22); characterized in that said weft thread (20) and said element-forming filamentary material (22) are both inserted in said upper and lower shed (17; 18), respectively, from the said one longitudinal edge (11a) of said tape; and that said hooking of said element-forming filamentary material (22) is carried out between said foundation warp threads (12, 13) and said fixing warp threads (14, 15), said heel portion (50) being oriented to project transversely beyond said one longitudinal edge (11a) of said stringer tape (11) and said head portion (25a) being directed toward said web portion (39) of said stringer tape (11).

2. An apparatus for manufacturing a woven slide fastener stringer, comprising:

- (a) a loom (10) for weaving a stringer tape (11) of foundation warp threads (12, 13), fixing warp threads (14, 15) and a single weft thread (20) progressively at a fell (16), said foundation warp threads (12, 13) and said weft thread (20) jointly constituting a web portion (39) of said tape (11), and said fixing warp threads (14, 15) extending along one longitudinal edge (11a) of said tape (11), said loom (10) including

- (1) a reed (23) having guide slots (23a) for the passage therethrough of said foundation warp threads (12, 13) and adapted to beat said foundation weft threads (20) against said fell (16),

- (2) an element-shaping plate (31) secured to and movable with said reed (23) toward and away from said fell (16), said element-shaping plate (31) extending in parallel alignment with said guide slots (23a) and in between said fixing warp threads (14, 15),

- (3) means forming upper and lower sheds (17, 18) for selectively moving said warp threads (12 - 15) up and down,
- (4) a first filling carrier (19) disposed at said one longitudinal edge (11a) of said



The foundation weft thread 37 passes around the last upper warp binding thread 45a up toward and around the last lower warp binding thread 45b to form a straight run or span 51 therebetween adjacent the coupling head 47 of the element 34 which extends substantially perpendicularly with respect to the general plane of the stringer tape 35. The straight span 51 of the weft thread 37 defines an axis about which the stringer tape 35 is folded back so that the coupling head portion 47 of each coupling element 34 now projects transversely beyond the longitudinal edge portion 38 of the tape 35, while the heel portion 50 of the element 34 is concealed from view by the web portion 39 of the tape 35 which has been turned over to overlie the heel portion 50 as shown in Figures 6 and 7. A portion of the weft thread 37 inserted in double picks, which is interlaced with the foundation warp threads 36 in the region of the straight span 51, forms an abutment 52 transversely projecting toward the coupling head 47 of the element 34. The abutment 52 on one of a pair of stringers 33 is brought into abutting engagement with that on the other of the paired stringers 33 when the two stringers 33 are coupled together in a well known manner by a slider not shown. The abutments 52 thus effectively conceal the row of coupling elements 34 from view and can remain joined together against lateral pull or vertical thrust by the fixing warp thread system described herein which holds the coupling elements 34 firmly in place with the upper and lower legs 48, 49 of the respective elements 34 substantially superimposed one upon another to lie substantially perpendicular to the general plane of the stringer 33 and flattened to assume a relatively low profile as shown in Figures 5 - 7.

Claims

1. A method of manufacturing a woven slide fastener stringer, comprising the steps of:

- (a) weaving a stringer tape (11) with a group of foundation warp threads (12, 13), a group of fixing warp threads (14, 15) and a single weft thread (20) progressively at a fell (16), said foundation warp threads (12, 13) and said weft thread (20) jointly constituting a web portion (39) of said tape (11) and said fixing warp threads (14, 15) extending along one longitudinal edge (11a) of said tape;
- (b) forming upper and lower sheds (17, 18) between said groups of warp threads;
- (c) inserting said weft thread (20) in said upper shed (17) and introducing an element-forming filamentary material (22) in said lower shed (18) along a path extending substantially parallel to said warp threads

(12 - 15); and

(d) coiling said element-forming filamentary material (22) into a row of coupling elements (25) each having a coupling head portion (25a), substantially superimposed upper and lower leg portions (28, 29) and a heel portion (50) as said filamentary material (22) is woven into said stringer tape (11) along said one longitudinal edge (11a) thereof in synchronism with the weaving of said stringer tape (11), whereby said coiling steps includes hooking said element-forming filamentary material (22); **characterized in that** said weft thread (20) and said element-forming filamentary material (22) are both inserted in said upper and lower shed (17; 18), respectively, from the said one longitudinal edge (11a) of said tape; and that said hooking of said element-forming filamentary material (22) is carried out between said foundation warp threads (12, 13) and said fixing warp threads (14, 15), said heel portion (50) being oriented to project transversely beyond said one longitudinal edge (11a) of said stringer tape (11) and said head portion (25a) being directed toward said web portion (39) of said stringer tape (11).

2. An apparatus for manufacturing a woven slide fastener stringer, comprising:

- (a) a loom (10) for weaving a stringer tape (11) of foundation warp threads (12, 13), fixing warp threads (14, 15) and a single weft thread (20) progressively at a fell (16), said foundation warp threads (12, 13) and said weft thread (20) jointly constituting a web portion (39) of said tape (11), and said fixing warp threads (14, 15) extending along one longitudinal edge (11a) of said tape (11), said loom (10) including

- (1) a reed (23) having guide slots (23a) for the passage therethrough of said foundation warp threads (12, 13) and adapted to beat said foundation weft threads (20) against said fell (16),

- (2) an element-shaping plate (31) secured to and movable with said reed (23) toward and away from said fell (16), said element-shaping plate (31) extending in parallel alignment with said guide slots (23a) and in between said fixing warp threads (14, 15),

- (3) means forming upper and lower sheds (17, 18) for selectively moving said warp threads (12 - 15) up and down,

- (4) a first filling carrier (19) disposed at said one longitudinal edge (11a) of said

stringer tape (11) and reciprocable for introducing said weft thread (20) in said upper shed (17) into engagement with said warp threads (12 - 15),

(5) a second filling carrier (21) disposed in parallel spaced relation to said first filling carrier (19) and reciprocable for introducing an element-forming filamentary material (22) in said lower shed (18),

(b) a coiling means operable in synchronism with said loom (10) for coiling said element-forming filamentary material (22) into a row of coupling elements (25) each having a coupling head portion (25a), upper and lower leg portions (28, 29) and a heel portion (50), whereby the row of coupling elements (25) are woven into said stringer tape (11) as the latter is woven, said coiling means including a hook (27) disposed at said one longitudinal edge (11a) of said stringer tape (11) and movable in a plane perpendicular to the general plane of said stringer tape (11) between a first position located in alignment with said fell (16) and a second position remote from said fell (16), characterized in that said second filling carrier (21) is also disposed at the said one longitudinal edge (11a) of said stringer tape (11), and that said hook (27) is disposed between said foundation warp threads (12, 13) and said fixing warp threads (14, 15), said hook (27) during movement between said first and second positions causing each of said coupling elements to lie with said heel portion (50) oriented to project transversely beyond said one longitudinal edge (11a) of said stringer tape (11) and with said coupling head portion (25a) directed toward said web portion (39) of said stringer tape (11).

3. An apparatus according to claim 2 characterized in that said element-shaping plate (31) is removably secured to said reed (23).

4. An apparatus according to claim 2 characterized in that said second filling carrier (21) has a bifurcated distal end (21a) for receiving therein said element-forming filamentary material (22).

5. An apparatus according to claim 2 characterized in that said second filling carrier (21) has an aperture in its distal end (21a) for receiving therethrough said element-forming filamentary material (22).

6. An apparatus according to claim 2 characterized in that said element-shaping plate (31) has a straight punch edge (31a) extending in parallel alignment with said guide slots (23a) of said reed (23) and adapted to beat said element-forming filamentary material (22) against said fell (16).

Patentansprüche

1. Verfahren zum Herstellen eines gewebten Reißverschlußbandes, umfassend die Schritte:

(a) Weben eines Tragbandes (11) mit einer Gruppe von Grundkettfäden (12, 13), einer Gruppe von Befestigungskettfäden (14, 15) und einen einzelnen Schußfaden (20) zunehmend an einem Warenschluß (16), wobei die Grundkettfäden (12, 13) und der Schußfaden (20) gemeinsam einen Bahnbereich (39) des Tragbandes (11) bilden und wobei die Befestigungskettfäden (14, 15) entlang einem Längsrand (11a) des Tragbandes verlaufen;

(b) Ausbilden eines oberen und eines unteren Webfaches (17, 18) zwischen den Gruppen von Kettfäden;

(c) Eintragen des Schußfadens (20) in das obere Webfach (17) und Eintragen eines Kuppelglieder bildenden Drahtmaterials (22) in das untere Webfach (18) entlang einer Bahn, die zu den Kettfäden (12 - 15) im wesentlichen parallel verläuft; und

(d) Wickeln des Kuppelglieder bildenden Drahtmaterials (22) in eine Reihe von Kuppelgliedern (25), die jeweils einen Kuppelungskopf (25a), im wesentlichen übereinanderliegende obere und untere Schenkel (28, 29) und einen Fersenbereich (50) aufweisen, während das Drahtmaterial (22) synchron mit dem Weben des Tragbandes (11) in das Tragband (11) entlang den besagten einen Längsrand (11a) desselben eingewebt wird, wobei die Wickelschritte das Anhängen des Kuppelglieder bildenden Drahtmaterials (22) umfassen; dadurch gekennzeichnet, daß sowohl der Schußfaden (20) als auch das Kuppelglieder bildende Drahtmaterial (22) von dem besagten einen Längsrand (11a) des Tragbandes her in das obere bzw. in das untere Webfach (17; 18) eingetragen werden; und daß das Anhängen des Kuppelglieder bildenden Drahtmaterials (22) zwischen den Grundkettfäden (12, 13) und den Befestigungskettfäden (14, 15) durchgeführt wird, wobei der Fersenbereich (50) so orientiert ist, daß er in Querrichtung über den besagten einen Längsrand (11a) des Tragbandes (11) vorsteht und wobei der Kupp-



lungskopf (25a) dem Bahnbereich (39) des Tragbandes (11) zugekehrt ist.

2. Vorrichtung zum Herstellen eines gewebten Reißverschlußbandes, umfassend:

(a) eine Webmaschine (10) zum Weben eines Tragbandes (11) aus Grundkettfäden (12, 13), Befestigungskettfäden (14, 15) und einem einzelnen Schußfaden (20) zunehmend an einem Warenschluß (16), wobei die Grundkettfäden (12, 13) und der Schußfaden (20) gemeinsam einen Bahnbereich (39) des Tragbandes (11) bilden und wobei die Befestigungskettfäden (14, 15) entlang einem Längsrand (11a) des Tragbandes (11) verlaufen, wobei die Webmaschine (10) aufweist

(1) ein Webblatt (23) mit Führungsschlitzen (23a) für den Durchgang der Grundkettfäden (12, 13), das den Schußfaden (20) an den Warenschluß (16) anschlagen kann,

(2) eine Kuppelglieder-Formplatte (31) die an dem Webblatt (23) befestigt und mit diesem zu dem Warenschluß (16) hin und von diesem weg bewegbar ist, wobei sich die Kuppelglieder-Formplatte (31) parallel zu den Führungsschlitzen (23a) und zwischen den Befestigungskettfäden (14, 15) erstreckt,

(3) Mittel zum wahlweisen Auf- und Abbewegen der Kettfäden (12 - 15), die das obere und das untere Webfach (17, 18) bilden,

(4) eine erste Eintragnadel (19), die an dem besagten einen Längsrand (11a) des Tragbandes (11) angeordnet und hin- und herbewegbar ist, um den Schußfaden (20) zum Eingriff mit den Kettfäden (12 - 15) in das obere Webfach (17) einzutragen,

(5) eine zweite Eintragnadel (21), die im Abstand parallel zu der ersten Eintragnadel (19) angeordnet und hin- und herbewegbar ist, um ein Kuppelglieder bildendes Drahtmaterial (22) in das untere Webfach (18) einzutragen,

(b) eine synchron mit der Webmaschine (10) betätigbare Wickeleinrichtung zum Wickeln des Kuppelglieder bildenden Drahtmaterials (22) in eine Reihe von Kuppelgliedern (25), die jeweils einen Kupplungskopf (25a), obere und untere Schenkel (28, 29) und einen Fersenbereich (50) haben, wodurch die Reihe von Kuppelgliedern (25) in das Tragband (11) eingewebt wird, während dieses gewebt wird, wobei die Wickeleinrichtung einen Haken (27) aufweist, der an

dem besagten einen Längsrand (11a) des Tragbandes (11) angeordnet und in einer zur Hauptebene des Tragbandes (11) rechtwinkligen Ebene zwischen einer mit dem Warenschluß (16) fluchtenden ersten Stellung und einer von dem Warenschluß (16) entfernten zweiten Stellung bewegbar ist, dadurch gekennzeichnet, daß die zweite Eintragnadel (21) ebenfalls an dem besagten einen Längsrand (11a) des Tragbandes (11) angeordnet ist und daß der Haken (27) zwischen den Grundkettfäden (12, 13) und den Befestigungskettfäden (14, 15) angeordnet ist, wobei der Haken (27) während der Bewegung zwischen der besagten ersten und zweiten Stellung bewirkt, daß jedes Kuppelglied so angeordnet ist, daß sein Fersenbereich (50) in Querrichtung über den besagten einen Längsrand (11a) des Tragbandes (11) vorspringt und daß der Kupplungskopf (25a) dem Bahnbereich (39) des Tragbandes (11) zugekehrt ist.

3. Vorrichtung nach Anspruch 2, dadurch gekennzeichnet, daß die Kuppelglieder-Formplatte (31) an dem Webblatt (23) lösbar befestigt ist.

4. Vorrichtung nach Anspruch 2, dadurch gekennzeichnet, daß die zweite Eintragnadel (21) ein gegabeltes Vorderende (21a) hat, um darin das Kuppelglieder bildende Drahtmaterial (22) aufzunehmen.

5. Vorrichtung nach Anspruch 2, dadurch gekennzeichnet, daß die zweite Eintragnadel (21) eine Öffnung in ihrem Vorderende (21a) aufweist, durch die sich das Kuppelglieder bildende Drahtmaterial (22) erstreckt.

6. Vorrichtung nach Anspruch 2, dadurch gekennzeichnet, daß die Kuppelglieder-Formplatte (31) eine gerade Anschlagkante (31a) hat, die parallel zu den Führungsschlitzen (23a) des Webblattes (23) verläuft und das Kuppelglieder bildende Drahtmaterial (22) an den Warenschluß (16) anschlagen kann.

Revendications

1. Procédé de fabrication d'une bande d'accrochage tissée pour fermeture à glissière, comprenant les étapes consistant à :

(a) tisser de manière progressive au niveau d'une façure (16) un ruban (11) de bande d'accrochage avec un groupe de fils de chaîne de base (12, 13), un groupe de fils de chaîne de fixation (14, 15) et un seul fil





de trame (20), lesdits fils de chaîne de base (12, 13) et ledit fil de trame (20) constituant conjointement une partie tissu (39) dudit ruban (11) et lesdits fils de chaîne de fixation (14, 15) s'étendant le long d'un bord longitudinal (11a) dudit ruban,

(b) former des foules supérieure et inférieure (17, 18) entre lesdits groupes de fils de chaîne,

(c) insérer ledit fil de trame (20) dans ladite foule supérieure (17) et introduire un matériau filamentaire (22) de formation d'éléments d'accouplement dans ladite foule inférieure (18) suivant un chemin qui s'étend sensiblement parallèlement auxdits fils de chaîne (12-15), et

(d) enrouler ledit matériau filamentaire (22) de formation d'éléments d'accouplement en une rangée d'éléments d'accouplement (25), comprenant chacun une partie (25a) formant tête d'accouplement sensiblement superposée à des parties (28, 29) formant branches supérieure et inférieure et une partie (50) formant base, à mesure que ledit matériau filamentaire (22) est tissé dans ledit ruban (11) de bande d'accrochage le long dudit premier bord longitudinal (11a) en synchronisme avec le tissage dudit ruban (11) de bande d'accrochage, ce qui fait que ladite étape d'enroulement comprend un crochetage dudit matériau filamentaire (22) de formation d'éléments d'accouplement, caractérisé en ce que ledit fil de trame (20) et ledit matériau filamentaire (22) de formation d'éléments d'accouplement sont tous deux insérés respectivement dans lesdites foules supérieure et inférieure (17, 18) depuis ledit premier bord longitudinal (11a) dudit ruban, en ce que ledit crochetage dudit matériau filamentaire (22) de formation d'éléments d'accouplement s'effectue entre lesdits fils de chaîne de base (12, 13) et lesdits fils de chaîne de fixation (14, 15), ladite partie (50) formant base étant orientée pour dépasser transversalement au-delà dudit premier bord longitudinal (11a) dudit ruban (11) de bande d'accrochage et ladite dite partie (25a) formant tête étant orientée vers ladite partie tissu (39) dudit ruban (11) de bande d'accrochage.

2. Appareil de fabrication d'une bande d'accrochage tissée pour fermeture à glissière, comprenant :

(a) un métier à tisser (10) pour tisser progressivement au niveau d'une façure (16) un ruban (11) de bande d'accrochage fait de fils de chaîne de base (12, 13), de fils de

chaîne de fixation (14, 15) et d'un seul fil de trame (20), lesdits fils de chaîne de base (12, 13) et ledit fil de trame (20) constituant conjointement une partie tissu (39) dudit ruban (11) et lesdits fils de chaîne de fixation (14, 15) s'étendant le long d'un bord longitudinal (11a) dudit ruban, ledit métier à tisser (10) comprenant :

(1) un peigne (23) qui comporte des fentes de guidage (23a) pour le passage desdits fils de chaîne de base (12, 13) et qui est capable de battre ledit fil de trame (20) contre ladite façure (16),

(2) une plaque (31) de façonnage d'éléments, fixée audit peigne (23) et déplaçable avec lui pour s'éloigner et se rapprocher de ladite façure (16), ladite plaque (31) de façonnage d'éléments s'étendant parallèlement auxdites fentes de guidage (23a) et entre lesdits fils de chaîne de fixation (14, 15),

(3) des moyens de formation de foules supérieure et inférieure (17, 18) pour faire sélectivement monter et descendre lesdits fils de chaîne (12-15),

(4) un premier chariot de remplissage (19) placé sur ledit premier bord longitudinal (11a) dudit ruban (11) de bande d'accrochage et pouvant aller et venir pour introduire ledit fil de trame (20) dans ladite foule supérieure (17), en entrelacement avec lesdits fils de chaîne (12-15),

(5) un second chariot de remplissage (21) placé de manière parallèle et espacée par rapport audit premier chariot de remplissage (19) et pouvant aller et venir pour introduire un matériau filamentaire (22) de formation d'éléments d'accouplement dans ladite foule inférieure (18),

(b) un moyen d'enroulement fonctionnant en synchronisme avec ledit métier à tisser (10) pour enrouler ledit matériau filamentaire (22) de formation d'éléments d'accouplement en une rangée d'éléments d'accouplement (25), comprenant chacun une partie (25a) formant tête d'accouplement, des parties (28, 29) formant branches supérieure et inférieure et une partie (50) formant base, grâce à quoi la rangée d'éléments d'accouplement (25) est tissée dans ledit ruban (11) de bande d'accrochage pendant le tissage de celui-ci, ledit moyen d'enroulement comprenant un crochet (27) placé sur ledit premier bord longitudinal (11a) dudit ruban (11) de bande d'accrochage et pouvant se déplacer dans un plan perpendiculaire au plan général dudit ruban (11) de bande d'accro-

chage entre une première position dans l'alignement de ladite façade (16) et une seconde position éloignée de ladite façade (16),

caractérisé en ce que ledit second chariot de remplissage (21) est également placé sur ledit premier bord longitudinal (11a) dudit ruban (11) de bande d'accrochage, et en ce que ledit crochet (27) est placé entre lesdits fils de chaîne de base (12, 13) et lesdits fils de chaîne de fixation (14, 15), ledit crochet (27), pendant le déplacement entre lesdites première et seconde positions, amenant chacun desdits éléments d'accouplement à se placer avec ladite partie (50) formant base orientée pour dépasser transversalement au-delà dudit premier bord longitudinal (11a) dudit ruban (11) de bande d'accrochage et avec ladite partie (25a) formant tête d'accouplement orientée vers ladite partie tissu (39) dudit ruban (11) de bande d'accrochage.

3. Appareil selon la revendication 2, caractérisé en ce que ladite plaque (31) de façonnage d'éléments est fixée de manière amovible audit peigne (23). 25
4. Appareil selon la revendication 2, caractérisé en ce que ledit second chariot de remplissage (21) a une extrémité distale fourchue (21a) destinée à recevoir ledit matériau filamenteux (22) de formation d'éléments d'accouplement. 30
5. Appareil selon la revendication 2, caractérisé en ce que ledit second chariot de remplissage (21) comporte une ouverture dans son extrémité distale (21a) pour faire passer ledit matériau filamenteux (22) de formation d'éléments d'accouplement. 35 40
6. Appareil selon la revendication 2, caractérisé en ce que ladite plaque (31) de façonnage d'éléments a un bord de frappe rectiligne (31a) qui s'étend parallèlement auxdites fentes de guidage (23a) dudit peigne (23) et est capable de battre ledit matériau filamenteux (22) de formation d'éléments d'accouplement contre ladite façade (16). 45 50

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