

A SLIDING CLASP FASTENER HAVING WOVEN STRINGER TAPES AND
WOVEN-IN PREFABRICATED ROWS OF INTERLOCKING MEMBERS

This invention relates to a sliding clasp fastener having woven stringer tapes and woven-in prefabricated rows of interlocking members each formed helically from a plastics monofilament, in which the interlocking members, seen in a projection on the plane of the sliding clasp fastener, have limbs overlying each other at least on the interlocking side of the fastener, interlocking heads protruding beyond the edges of the stringer tapes, an inserted core and attachment sections, each row of interlocking members being attached to the top face of its stringer tape by binding warp threads engaging the limbs of each interlocking member and at least one wrapping thread engaging the limbs and the core, and attaching them to the stringer tape, the binding warp threads being crossed over between successive interlocking members, and the wrapping threads passing round the binding warp threads in a loop between successive interlocking members. Unlike the so-called woven type of sliding clasp fastener, the rows of interlocking members in the present type of sliding clasp fastener are not produced by a weaving process when weaving the supporting tapes, but are, in contrast, prefabricated and incorporated as completed chains of interlocking members when the stringer tapes are woven. The wrapping threads can be weft threads with a special cross-weave (for example a twill weave).

In the known (and practically used) sliding clasp fasteners of the generic type, the limbs of each interlocking member act as part of the connection between adjacent

interlocking members in the row; and when seen in the plane of the rows of interlocking members they overlies each other over part at least of their length. Consequently, the wrapping threads pass round the limbs towards the opposite side of the fastener to the rows of interlocking heads, and the binding warp threads lie away from the interlocking heads, in front of the rearward connecting sections of the helical rows. This arrangement is not without its disadvantages. Where the wrapping threads pass round the connecting sections, they come into contact with the flanks of the operating slider when the sliding clasp fastener is stretched transversely. Thus when the slider is moved the wrapping threads are abraded and undergo premature wear which damages the binding. Transverse stresses can also displace the array of binding warp threads and wrapping threads which binds the interlocking members, which further aggravates the wear effects on the wrapping threads, caused as described by the slider.

In a different sliding clasp fastener having woven-in prefabricated rows of interlocking members and a core, but having no binding warp threads, wrapping threads encircle the core and the limbs of the interlocking members, which similarly form parts of the rearward connecting sections. The same disadvantages arise in this case, even though an additional inlay thread is provided, which lies beneath the row of interlocking members, is laid in grooves in the limbs of the interlocking members, and is bound in together with the interlocking members for the purpose of preventing displacements under transverse stretching. Finally, the same disadvantages arise in another embodiment, in which the rows

of interlocking members are not attached to the top faces of the stringer tapes, but as it were bound in concentrically, and provided with a core. Transverse stretching once again displaces the interlocking members in their binding, with the result that the wrapping threads come into contact with the slider flanks in spite of the inlaid core.

The object of the invention is to modify and improve a sliding clasp fastener of the generic type, so that damaging contact can no longer occur between the wrapping threads and the flanks of the operating slider, even under substantial transverse stresses.

According to the present invention, a sliding clasp fastener comprises woven stringer tapes and woven-in prefabricated rows of interlocking members each formed helically from a plastics monofilament, in which the interlocking members, seen in a projection on the plane of the sliding clasp fastener, have limbs overlying each other at least on the interlocking side of the fastener, interlocking heads protruding beyond the edges of the stringer tapes, an inserted core and attachment sections, each row of interlocking members being attached to the top face of its stringer tape by binding warp threads engaging the limbs of each interlocking member and at least one wrapping thread engaging the limbs of each interlocking member and the core, and attaching them to the stringer tape, the binding warp threads being crossed over between successive interlocking members, and the wrapping threads passing round the binding warp threads in a loop between successive interlocking members, the attachment sections of the interlocking members,

seen in a projection on the plane of the sliding clasp fastener, being disposed generally centrally of the interlocking members in the transverse direction, spaced from the interlocking heads and from rearward return loops of the interlocking members, the binding warp threads being disposed in the stringer tapes beneath the transverse centre of the interlocking members and drawn on to the attachment sections by the loops of the wrapping threads which pass partly round the attachment sections. Thus, the wrapping threads are as it were countersunk between the limbs of adjacent interlocking members. This precludes damaging contact with the flanks of the sliding clasp fastener slider. Furthermore, since the binding warp threads in the supporting tapes lie below the centre of the interlocking members and are drawn by the wrapping threads on to the attachment sections disposed in the central area, the interlocking members and hence the rows thereof are laid so tightly on the stringer tapes that no damaging displacements can occur, even under transverse stretching, whereby the wrapping threads could be brought into contact with the flanks of the operating slider. The effects are further enhanced by the cores, which are also preferably disposed centrally of the interlocking members. Thus, simple means are used to prevent the aforementioned abrasive wearing action on the wrapping threads when the slider is operated, which causes the binding to fail prematurely.

The invention can be effected in a variety of detailed embodiments. Thus, one embodiment is characterised in that the rearward return loops of the helical rows are adapted as connecting sections to unite individual interlocking members

into continuous rows thereof, while the attachment sections are formed as upper and lower convergent attachment sections in the direction of the interlocking heads between successive connecting sections. Another embodiment is characterised in that the attachment sections also form part of the connecting sections between the interlocking members in the rows thereof, and are encircled by the wrapping threads. It is within the scope of the invention to dispose an additional warp thread below the central areas of the rows of interlocking members and to bind it into the stringer tape between the rows of interlocking members.

It is within the scope of the invention to work with a single wrapping thread for each row of interlocking members. Depending on the size of the sliding clasp fastener, the thickness of the textile threads used for the stringer tapes and the diameter of the plastics monofilament from which the rows of interlocking members are formed, it can be advantageous to provide two wrapping threads for each row of interlocking members, binding together the binding warp threads, the attachment sections and the core, and to weave the wrapping threads singly and alternately in successive lines of the stringer tape structure. The effect of this is to weave each stringer tape with a pair of wrapping threads and bind both wrapping threads round the attachment sections, the core and the binding warp threads. Furthermore, the textile structure of the stringer tapes is kept in register with the structure of the rows of interlocking members.

The invention will now be described by way of example, in more detail, with reference to the following schematic

drawings, in which:-

Figure 1 is a greatly enlarged schematic plan view of part of one half of a sliding clasp fastener of the invention, the binding warp threads and wrapping threads having been removed from the upper half;

Figure 2 is a section taken on the line A-A of Figure 1;

Figure 3 is a section taken on the line B-B of Figure 1;

Figure 4 is a corresponding view to Figure 1 of another embodiment of a sliding clasp fastener of the invention; and

Figure 5 is a section taken on the line C-C of Figure 4.

The sliding clasp fasteners shown in the Figures consist basically of woven stringer tapes 1 and woven-in prefabricated rows 2 of interlocking members each formed helically from a plastics monofilament.

It will be seen from Figures 1 and 5 that the interlocking members 3, seen in a projection on the plane of the sliding clasp fastener, have limbs 4 overlying each other on the side towards interlocking heads 6 that protrude beyond the edges 5 of the stringer tapes 1, an inserted core 7 and attachment sections 8. It will also be seen, more particularly by comparing Figures 1 and 2 and/or Figures 4 and 5, that each row 2 of interlocking members 3 is attached to the top face of its stringer tape 1 by binding warp threads 9 engaging the limbs at the interlocking side of each interlocking member 3 with at least one wrapping thread 10

engaging the attachment sections 8 and the core 7 and attaching them to the stringer tape 1. The binding chain threads 9 are crossed over between successive interlocking members 3. The wrapping threads 10 pass round the binding warp threads 9 in a loop 11 between successive interlocking members 3.

The arrangement is such that the attachment sections 8, seen in a projection on the plane of the sliding clasp fastener, are disposed in the central area B of the interlocking members 3, some distance from the interlocking heads 6 but also some distance from the rearward return loops 12, while the binding warp threads 9 are disposed in the stringer tapes 1 beneath the central area B of the interlocking members 3 and drawn on to the attachment sections 8 by the loops 11 of the wrapping threads 10 which pass partly round the attachment sections 8.

In the embodiment shown in Figures 1 and 2, the rearward return loops 12 are adapted as connecting sections, while the attachment sections 8 are formed as upper and lower convergent sections between successive connecting sections. In the embodiment shown in Figures 4 and 5, the attachment sections 8 also act as connecting sections between the interlocking members 3 in the rows 2 thereof, and are encircled by the wrapping threads 10. Figure 2 shows that an additional warp thread 13 is disposed under the central area B and bound into the associated supporting tape 1 between the interlocking members 3 to provide additional strength below the position of the attachment sections 8. Moreover, the cores 7 in the preferred embodiments shown are disposed along

the longitudinal axis of the interlocking members 3. Though it is not shown, two wrapping threads 10 can be provided for each row 2 of interlocking members, binding together the binding warp threads 9, the attachment sections 8 and the
5 core 7, while the wrapping threads 10 are woven singly and alternately in successive lines of the structure of the supporting tape 1.

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CLAIMS

1. A sliding clasp fastener comprising woven stringer tapes and woven-in prefabricated rows of interlocking members each formed helically from a plastics monofilament, in which the interlocking members, seen in a projection on the plane of the sliding clasp fastener, have limbs overlying each other at least on the interlocking side of the fastener, interlocking heads protruding beyond the edges of the stringer tapes, an inserted core and attachment sections, each row of interlocking members being attached to the top face of its stringer tape by binding warp threads engaging the limbs of each interlocking member and at least one wrapping thread engaging the core and extending around the lowermost limbs of the interlocking members and attaching them to the stringer tape, the binding warp threads being crossed over between successive interlocking members, and the wrapping threads passing round the binding warp threads in a loop between successive interlocking members, the attachment sections of the interlocking members, seen in a projection on the plane of the sliding clasp fastener, being disposed generally centrally of the interlocking members in the transverse direction, spaced from the interlocking heads and from rearward return loops of the interlocking members, the binding warp threads being disposed in the stringer tapes beneath the transverse centre of the interlocking members and drawn on to the attachment sections by the loops of the wrapping threads which pass partly round the attachment sections.

2. A sliding clasp fastener as in Claim 1, wherein the rearward return loops of the helical row of interlocking



members connect the adjacent individual interlocking members into continuous rows, to provide upper and lower convergent attachment sections between successive return loops in the direction towards the interlocking heads.

3. A sliding clasp fastener as in Claim 1, wherein the attachment sections form part of the connection between adjacent interlocking members in the rows thereof, and are encircled by the wrapping threads.

4. A sliding clasp fastener as in any of Claims 1 to 3, wherein an additional warp thread is disposed below the transverse centre of the rows of interlocking members and bound into the stringer tape between successive interlocking members.

5. A sliding clasp fastener as in any of Claims 1 to 4, wherein the core is disposed along the longitudinal axis of the rows of interlocking members.

6. A sliding clasp fastener as in any of Claims 1 to 5, wherein two wrapping threads are provided for each row of interlocking members, binding together the binding warp threads, the attachment sections, and the core, and the wrapping threads are woven singly and alternately in successive lines of the structure of the stringer tape.

7. A sliding clasp fastener, substantially as hereinbefore described with reference to Figures 1 to 3 of the accompanying drawings.

8. A sliding clasp fastener substantially as hereinbefore described with reference to Figures 4 and 5 of the accompanying drawings.
