

PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Improvements in and relating to Sliding Clasp Fasteners

We, YOSHIDA KOGYO KABUSHIKI KAISHA, of No. 1 Kanda Izumi-cho, Chiyoda-ku, Tokyo, Japan, a Corporation organised and existing under the Laws of 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 sliding clasp fasteners.

Positional stability and proper alignment of the first meshing elements immediately above a separable end fitting of a sliding clasp fastener are essential to orderly, smooth meshing of the rest of the row of elements arranged along the edges of the stringers.

It is an object of this invention to provide a sliding clasp fastener in which this difficulty is reduced. It is desirable to reduce the shifting of the first meshing terminal one of each row of interlocking elements away from the stitching of the tape under repeated coupling and uncoupling of the stringers by a slider.

The invention includes a sliding clasp fastener having a pair of stringer tapes each having a bottom portion and carrying a row of interlocking elements made from a single filament terminating in a linear part, the rows being adapted to be interlocked by a slider, thread means for stitching said rows of elements to said tapes, and an end fitting comprising a box member and a pin member secured to the bottom portions of the two stringer tapes respectively, the linear part of each of the two rows extending on contact with one side of the bottom portion of the corresponding stringer tape.

Preferably the thread means on each tape forms a bead of stitching extending along each of the bottom portions of said tapes and arranged to engage the corresponding end fitting to retain it in position.

There now follows a description referring to the accompanying drawings in which:—

Figure 1 is a diagrammatic front view of the bottom portion of a sliding fastener with a pin part of a separate end fitting inserted halfway into a box part of the fitting;

Figure 2 is a view from the reverse side of the fastener of Figure 1;

Figure 3 is a sectional view taken on the line I—I of Figure 1 on an enlarged scale;

Figure 4 is a sectional view taken on the line II—II of Figure 1 on an enlarged scale;

Figure 5 is a view, similar to Figure 1, but the rows of elements are of different shape;

Figure 6 is a sectional view taken on the line III—III of Figure 5 on an enlarged scale;

Figure 7 is a sectional view taken on the line IV—IV of Figure 5 on an enlarged scale;

Figure 8 is a view, similar to Figure 1, showing the pin and box parts of the end fitting fully coupled;

Figure 9 is a diagrammatic reverse view of the bottom portion of the fastener corresponding to Figure 2;

Figure 10 is a view, similar to Figure 9;

Figure 11 is a view, similar to Figure 1, showing another embodiment of the invention;

Figure 12 is a sectional view taken on the line V—V of Figure 11 on an enlarged scale;

Figure 13 is a sectional view taken on the line VI—VI of Figure 11 on an enlarged scale; and

Figure 14 shows a fastener element chain.

Each sliding clasp fastener shown has a pair of flat fabric stringer tapes T, each having an inner marginal edge 10 along which is arranged a row of closely spaced and aligned interlocking elements E, each row being made from a single plastics filament. The rows of elements E are attached to the

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respective stringer tapes by two-thread chain stitching S which extends to the lower end of a bottom portion T' of each stringer tape which is devoid of elements.

5 In the embodiment shown in Figures 1 to 4, each row of elements is of the meander form and the terminal element E' of each row of elements has a linear extension 11 spaced from the longitudinal edges of each stringer tape on the opposite side of the tape to the bead produced by the stitching and extending to the bottom end of the tape and in contact with it. This will be better understood from Figure 9. Each fastener has a separable end fitting which includes a pin member 16 and a box member 17.

10 Each stringer tape portion T' is reinforced in the first embodiment of Figures 1-4 by portions 12 integral with the corresponding members of the end fitting and attached to the tape with the end fitting member by injection moulding. Alternatively, as in the case of the second embodiment shown in Figures 5 to 7 and later described, the bottom portion T' of each stringer tape is reinforced with suitable material such as a plastics film 18 which is folded around the portion T' to form a coating enclosing the terminal element extension 11 and the stitching S, and adhesively secured to the tape with heat and pressure or with use of an adhesive.

15 In the first embodiment, each terminal element extension 11 forms a ridge 13 along the back of the inner edge portion of the portion T' of its tape, while the bead produced by the stitching S forms a second ridge 14 along the inner edge portion of the portion T' on the opposite side to first ridge 13. The extensions 11 prevent the terminal elements E' from shifting away from the stitching S since the end fitting anchors the extensions 11 to the tapes.

20 The side of the reinforced tape portion T' to which the extension 11 of the element E' is attached depends upon the form of interlocking elements E used.

25 With each row of elements made by coiling a single plastics filament as shown in Figures 5-7, each row is on the same side of its tape as the bead formed by the stitching S. In the second embodiment, therefore, a linear extension 11 of each coil terminal element E' is arranged spaced from the longitudinal edges thereof alongside the bead formed by the stitching S as seen at Figure 10. This extension 11 extends to the bottom end of its tape and is secured with a plastics film 18 to the bottom portion T' of the stringer tape to make contact therewith and a ridge 15 is formed along the marginal edge.

30 The end fitting portions are arranged to engage the ridges 13 and 14 of the first embodiment or the ridge 15 of the second embodiment to prevent movement of the ex-

tensions 11 and thus the terminal elements E'.

35 In the third embodiment shown in Figures 11-13, each row of elements is of meander form for purposes of illustration, and each terminal element has a linear extension 11 extending partly in a lateral direction i.e. obliquely across and in contact with the bottom portion T' of its tape spaced from the longitudinal edges and adhesively secured in place with a plastics film 18.

40 This example provides for positional stability of the terminal element E' of each row of elements, which is normally subjected to severer local strain under repeated opening and closure of the stringers than the rest of elements in the row, and further provides that the linear extension 11 extending partly laterally of the reinforced tape portion T' imparts to this portion of the tape a suitable resiliency inherent in the plastics material of the extension which facilitates easy coupling and uncoupling of the end fitting while preventing severe flexing of the reinforced tape portion T' between the terminal element E' and the end fitting even when it is subjected to local strain under repeated coupling and uncoupling of the pin and box members of the fitting. The pin member of the separable end fitting has a ridge portion 20 and the box member 17 has a groove 21 for slidable engagement with the ridge portion 20. The pin member 16 is further provided with a lug 22 at one end of the ridge portion 20 for abutting engagement with the terminal element E' on the box side of the stringer. End fittings of this kind are well known and hence, will require no further description. It is to be noted, however, that end fittings of plastics or metallic material are suitable. Each fastener, of course, is opened and closed by a slider 30.

45 It is preferred to make the fasteners from a fastener element chain of the form shown in Figure 14 which has linear, portions 31 interposed at suitable intervals between series of interlocking elements either of the meander form as shown or of the coil form. These portions 31 are readily utilized as anchoring extensions 11 of the terminal element E' in the manner described. It is however possible to elongate a certain number of individual elements of any existing configuration and form a linear portion corresponding to the extension 11 of the terminal element E'.

WHAT WE CLAIM IS:—

1. A sliding clasp fastener having a pair of stringer tapes each having a bottom portion and carrying a row of interlocking elements made from a single filament terminating in a linear part, the rows being adapted to be interlocked by a slider, thread means for stitching said rows of elements to said tapes, and an end fitting comprising a box member



respective stringer tapes by two-thread chain stitching S which extends to the lower end of a bottom portion T' of each stringer tape which is devoid of elements.

5 In the embodiment shown in Figures 1 to 4, each row of elements is of the meander form and the terminal element E' of each row of elements has a linear extension 11 spaced from the longitudinal edges of each stringer tape on the opposite side of the tape to the bead produced by the stitching and extending to the bottom end of the tape and in contact with it. This will be better understood from Figure 9. Each fastener has a separable end fitting which includes a pin member 16 and a box member 17.

10 Each stringer tape portion T' is reinforced in the first embodiment of Figures 1-4 by portions 12 integral with the corresponding members of the end fitting and attached to the tape with the end fitting member by injection moulding. Alternatively, as in the case of the second embodiment shown in Figures 5 to 7 and later described, the bottom portion T' of each stringer tape is reinforced with suitable material such as a plastics film 18 which is folded around the portion T' to form a coating enclosing the terminal element extension 11 and the stitching S, and adhesively secured to the tape with heat and pressure or with use of an adhesive.

20 In the first embodiment, each terminal element extension 11 forms a ridge 13 along the back of the inner edge portion of the portion T' of its tape, while the bead produced by the stitching S forms a second ridge 14 along the inner edge portion of the portion T' on the opposite side to first ridge 13. The extensions 11 prevent the terminal elements E' from shifting away from the stitching S since the end fitting anchors the extensions 11 to the tapes.

30 The side of the reinforced tape portion T' to which the extension 11 of the element E' is attached depends upon the form of interlocking elements E used.

35 With each row of elements made by coiling a single plastics filament as shown in Figures 5-7, each row is on the same side of its tape as the bead formed by the stitching S. In the second embodiment, therefore, a linear extension 11 of each coil terminal element E' is arranged spaced from the longitudinal edges thereof alongside the bead formed by the stitching S as seen at Figure 10. This extension 11 extends to the bottom end of its tape and is secured with a plastics film 18 to the bottom portion T' of the stringer tape to make contact therewith and a ridge 15 is formed along the marginal edge.

40 The end fitting portions are arranged to engage the ridges 13 and 14 of the first embodiment or the ridge 15 of the second embodiment to prevent movement of the ex-

tensions 11 and thus the terminal elements E'.

In the third embodiment shown in Figures 11-13, each row of elements is of meander form for purposes of illustration, and each terminal element has a linear extension 11 extending partly in a lateral direction i.e. obliquely across and in contact with the bottom portion T' of its tape spaced from the longitudinal edges and adhesively secured in place with a plastics film 18.

This example provides for positional stability of the terminal element E' of each row of elements, which is normally subjected to severer local strain under repeated opening and closure of the stringers than the rest of elements in the row, and further provides that the linear extension 11 extending partly laterally of the reinforced tape portion T' imparts to this portion of the tape a suitable resiliency inherent in the plastics material of the extension which facilitates easy coupling and uncoupling of the end fitting while preventing severe flexing of the reinforced tape portion T' between the terminal element E' and the end fitting even when it is subjected to local strain under repeated coupling and uncoupling of the pin and box members of the fitting. The pin member of the separable end fitting has a ridge portion 20 and the box member 17 has a groove 21 for slidable engagement with the ridge portion 20. The pin member 16 is further provided with a lug 22 at one end of the ridge portion 20 for abutting engagement with the terminal element E' on the box side of the stringer. End fittings of this kind are well known and hence, will require no further description. It is to be noted, however, that end fittings of plastics or metallic material are suitable. Each fastener, of course, is opened and closed by a slider 30.

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WHAT WE CLAIM IS:—

1. A sliding clasp fastener having a pair of stringer tapes each having a bottom portion and carrying a row of interlocking elements made from a single filament terminating in a linear part, the rows being adapted to be interlocked by a slider, thread means for stitching said rows of elements to said tapes, and an end fitting comprising a box member



- and a pin member secured to the bottom portions of the two stringer tapes respectively, the linear part of each of the two rows extending on contact with one side of the bottom portion of the corresponding stringer tape. 5
2. A sliding clasp fastener as claimed in claim 1, wherein the thread means on each tape forms a bead of stitching extending along each of the bottom portions of said tapes and arranged to engage the corresponding end fitting to retain it in position. 10
3. A sliding clasp fastener as claimed in claim 2, wherein the bead of stitching and the said linear part of each stringer are located on opposite sides of an edge of the bottom portion of the tape. 15
4. A sliding clasp fastener as claimed in claim 2 wherein for each tape, said bead of stitching and said linear part are located on the same side of the bottom part of the tape in side by side relationship to form a ridge. 20
5. A sliding clasp fastener as claimed in claim 4 wherein the said ridge extends along an edge of the bottom portion of the tape. 25
6. A sliding clasp fastener as claimed in any of the preceding claims comprising reinforcing means arranged on the bottom portion of each of said tapes and covering the linear part of the interlocking element associated with that tape. 30
7. A sliding clasp fastener according to claim 6 wherein the reinforcing means comprises a material fitted onto the bottom portion of each tape and integral with the end-fitting. 35
8. A sliding clasp fastener as claimed in claim 6, wherein the reinforcing means comprises a plastic film forming a coating on said bottom portion of the tape and enclosing the linear part. 40
9. A sliding clasp fastener as claimed in any of the preceding claims wherein the linear parts of the two filaments extend into the box member and the pin member respectively. 45
10. A sliding clasp fastener substantially as described referring to Figures 1 to 4, 5 to 10 or 11 to 14.

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