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(54) SLIDING CLASP FASTENERS HAVING MOLDED OR DIE-CAST COUPLING ELEMENTS

(71) We, YOSHIDA KOGYO KABUSHIKI KAISHA, of No. 1, Kanda Izumi-cho, Chiyoda-ku, Tokyo, Japan; a corporation duly organized 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 having opposed stringer tapes of the type wherein the fastener elements are attached by injection or die casting to one surface of the respective stringer tapes.

There were known many fasteners carrying molded or die cast fastener elements of a discrete formation which are fixed in position with their leg portions mounted astride of the upper and lower surfaces of the stringer tapes along a longitudinal edge thereof. On account of the fastener elements being exposed on both surfaces of the stringer tapes, the conventional fasteners of this type were open to objection when used on garments such as shirts, ladies one-piece wears and the like where the fastener elements are disposed in contact with the skin of the wearer.

More recent improvements have been introduced wherein the fastener elements are mounted and fixed on only one surface of the stringer tapes so as to leave the other surface, facing toward the garment, free of fastener elements. However, such one-sided fasteners have suffered from the disadvantages that the protrusion of fastener elements above the one surface of the stringer tapes is literally so much greater, which in turn reduces the strength of adhesion of the fastener elements relative to the stringer tapes and which further creates the tendency of such protruding elements to catch the garment or other objects thereby damaging the latter or the fastener itself. A simple solution to this problem would be to reduce the thickness of the fastener

elements as measured in a plane perpendicular to the plane of the fastener. However, too thin fastener elements would result in reduced strength of coupling between the elements and would be liable to disengagement from one another.

It is therefore an object of the present invention to provide improved sliding clasp fasteners carrying on one surface a series of molded or die cast coupling elements, which elements incorporate structural features to render the same relatively thin yet without sacrifice in their coupling strength.

Another object of the invention is to provide improved sliding clasp fasteners of the type described whose elements are secured firmly into position on one surface of the fastener.

These and other objects and features of the invention will appear clear from the following detailed description thereof taken together with the accompanying drawings wherein like reference numerals denote like or corresponding parts throughout the several views and wherein:

FIG. 1 is a plan view of a sliding clasp fastener embodying the invention;

FIG. 2 is a sectional view taken along the line II—II of FIG. 1;

FIG. 3 is a perspective view of the reverse side of the fastener shown in FIG. 1;

FIG. 4 is a perspective view of a modification according to the invention; and

FIG. 5 is a sectional view of a half portion of another modified fastener according to the invention.

According to the invention, there is provided a sliding clasp fastener comprising a pair of oppositely disposed stringer tapes each carrying along their respective longitudinal edges on one surface a series of discrete molded or die cast elements, each of said elements consisting of an upper coupling member, a lower coupling

[Price 33p]

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member and a leg portion, said leg portion having formed in one side an indent having a depth approximating the thickness of the stringer tape, said indent providing a first surface for adhesive contact with the upper surface of the stringer tape and a second surface for adhesive contact with the end face of the longitudinal edge of the tape.

Referring now to the drawings and FIGS. 1 to 3 in particular, there is shown a sliding clasp fastener 10 which comprises a pair of oppositely disposed stringer tapes 11,11 each carrying along their respective longitudinal edges 12,12 on one surface a series of molded or die cast discrete coupling elements 13. Each element 13 consists of an upper coupling member 14 including at opposite sides protuberances 15,15 and reduced neck portions or sockets 16,16 engageable with the protuberances 15,15 of the upper coupling member 14 on the companion stringer tape to establish a coupling engagement of the elements 13 in a horizontal direction and a lower coupling member 17 substantially rectangular in shape with its outer end terminating short of the outer end of the upper coupling member 14 and engageable with the lower face of the upper coupling member 14 on the companion tape to establish a coupling engagement in a vertical direction, as seen in a conventional structure. The coupling elements 13 further consists of a leg portion 18 extending opposite to the coupling members 14,17 and disposed for attachment to the longitudinal edge 12 of the tape 11.

According to the invention, there is provided a cut-away recess or indent 19 in the lower surface of the leg portion 18, which recess is defined by a vertical wall 20 adjacent the lower coupling member 17 and a bottom wall 21 of the leg portion 18. The indent 19 has a depth approximating the thickness of the stringer tape 11 such that the end face 22 of the longitudinal edge 12 of the tape 11 is held in abutting relation to the vertical wall 20 and the upper surface 11' of the tape 11 is superposed on and affixed to the bottom wall 21 of the leg portion 18, thus securing the elements 13 firmly through two contact surfaces into position on the fastener 10. If necessary and when providing increased adhering strength between the tape 11 and the element 13, there may be provided a beard-like ridge 23 projecting longitudinally of the tape 11 for engagement in a groove 24 formed in the bottom wall 21 of the leg portion 18. To assure affixation of the elements 13 with greater stability to the respective tapes 11,11, the elements 13 may be stitched as at 25 along the longitudinal edges 12,12, for which purpose there is provided a stitch-receiving recess formed in the upper surface of each element 13 as shown, whereby

the stitchings 25 run substantially parallel with the longitudinal ridge 23.

Referring to FIG. 4, there is shown a modified form of element 13 wherein the lower coupling member 17 is triangular in shape with its apex 26 registering with the outer end of the upper coupling member 14. Another feature of this embodiment is found in the provision of a large bead-like ridge 23 and a correspondingly large groove 24 for embracing the same, whereby sufficient adhesion is obtained between the element and the tape without the necessity of providing stitches 25.

FIG. 5 shows another modification wherein the lower coupling member 17 has a height H greater than the thickness T of the tape 11.

It should be noted that in spite of the leg portion 18 of the element 13 being reduced in thickness to render the fastener relatively thin for the purposes hereinbefore stated, the strength of coupling engagement between the opposed elements 13 is not affected because sufficient dimensions of the coupling members 12,17 are sustained, and that the elements 13 are firmly secured into position on the tape 11 by virtue of the dual surface contact provided by the indent 19 as aforesaid.

WHAT WE CLAIM IS:—

1. A sliding clasp fastener comprising a pair of oppositely disposed stringer tapes each carrying along their respective longitudinal edges on one surface a series of discrete molded or die cast elements, each of said elements consisting of an upper coupling member, a lower coupling member and a leg portion, said leg portion having formed in one side an indent having a depth approximating the thickness of the stringer tape, said indent providing a first surface for adhesive contact with the upper surface of the stringer tape and a second surface for adhesive contact with the end face of the longitudinal edge of the tape.

2. A sliding clasp fastener as defined in claim 1 wherein said leg portion has formed in the other side a recess for accommodating stitches that secure the elements to the tapes.

3. A sliding clasp fastener as defined in claim 1 wherein there is provided a groove in the bottom wall of said indent for engagement with a correspondingly shaped bead-like ridge projecting from the upper surface of the tape.

4. A sliding clasp fastener as defined in claim 1 wherein said lower coupling member is rectangular in shape and has its outer end terminating short of the outer end of said upper coupling member.

5. A sliding clasp fastener as defined in claim 1 wherein said lower coupling



member and a leg portion, said leg portion having formed in one side an indent having a depth approximating the thickness of the stringer tape, said indent providing a first surface for adhesive contact with the upper surface of the stringer tape and a second surface for adhesive contact with the end face of the longitudinal edge of the tape.

Referring now to the drawings and FIGS. 1 to 3 in particular, there is shown a sliding clasp fastener 10 which comprises a pair of oppositely disposed stringer tapes 11, 11 each carrying along their respective longitudinal edges 12, 12 on one surface a series of molded or die cast discrete coupling elements 13. Each element 13 consists of an upper coupling member 14 including at opposite sides protuberances 15, 15 and reduced neck portions or sockets 16, 16 engageable with the protuberances 15, 15 of the upper coupling member 14 on the companion stringer tape to establish a coupling engagement of the elements 13 in a horizontal direction and a lower coupling member 17 substantially rectangular in shape with its outer end terminating short of the outer end of the upper coupling member 14 and engageable with the lower face of the upper coupling member 14 on the companion tape to establish a coupling engagement in a vertical direction, as seen in a conventional structure. The coupling elements 13 further consists of a leg portion 18 extending opposite to the coupling members 14, 17 and disposed for attachment to the longitudinal edge 12 of the tape 11.

According to the invention, there is provided a cut-away recess or indent 19 in the lower surface of the leg portion 18, which recess is defined by a vertical wall 20 adjacent the lower coupling member 17 and a bottom wall 21 of the leg portion 18. The indent 19 has a depth approximating the thickness of the stringer tape 11 such that the end face 22 of the longitudinal edge 12 of the tape 11 is held in abutting relation to the vertical wall 20 and the upper surface 11' of the tape 11 is superposed on and affixed to the bottom wall 21 of the leg portion 18, thus securing the elements 13 firmly through two contact surfaces into position on the fastener 10. If necessary and when providing increased adhering strength between the tape 11 and the element 13, there may be provided a bead-like ridge 23 projecting longitudinally of the tape 11 for engagement in a groove 24 formed in the bottom wall 21 of the leg portion 18. To assure affixation of the elements 13 with greater stability to the respective tapes 11, 11, the elements 13 may be stitched as at 25 along the longitudinal edges 12, 12, for which purpose there is provided a stitch-receiving recess formed in the upper surface of each element 13 as shown, whereby

the stitchings 25 run substantially parallel with the longitudinal ridge 23.

Referring to FIG. 4, there is shown a modified form of element 13 wherein the lower coupling member 17 is triangular in shape with its apex 26 registering with the outer end of the upper coupling member 14. Another feature of this embodiment is found in the provision of a large bead-like ridge 23 and a correspondingly large groove 24 for embracing the same, whereby sufficient adhesion is obtained between the element and the tape without the necessity of providing stitches 25.

FIG. 5 shows another modification wherein the lower coupling member 17 has a height H greater than the thickness T of the tape 11.

It should be noted that in spite of the leg portion 18 of the element 13 being reduced in thickness to render the fastener relatively thin for the purposes hereinbefore stated, the strength of coupling engagement between the opposed elements 13 is not affected because sufficient dimensions of the coupling members 12, 17 are sustained, and that the elements 13 are firmly secured into position on the tape 11 by virtue of the dual surface contact provided by the indent 19 as aforesaid.

WHAT WE CLAIM IS:—

1. A sliding clasp fastener comprising a pair of oppositely disposed stringer tapes each carrying along their respective longitudinal edges on one surface a series of discrete molded or die cast elements, each of said elements consisting of an upper coupling member, a lower coupling member and a leg portion, said leg portion having formed in one side an indent having a depth approximating the thickness of the stringer tape, said indent providing a first surface for adhesive contact with the upper surface of the stringer tape and a second surface for adhesive contact with the end face of the longitudinal edge of the tape.

2. A sliding clasp fastener as defined in claim 1 wherein said leg portion has formed in the other side a recess for accommodating stitches that secure the elements to the tapes.

3. A sliding clasp fastener as defined in claim 1 wherein there is provided a groove in the bottom wall of said indent for engagement with a correspondingly shaped bead-like ridge projecting from the upper surface of the tape.

4. A sliding clasp fastener as defined in claim 1 wherein said lower coupling member is rectangular in shape and has its outer end terminating short of the outer end of said upper coupling member.

5. A sliding clasp fastener as defined in claim 1 wherein said lower coupling

member is triangular in shape and has its apex registering with the outer end of said upper coupling member.

5 6. A sliding clasp fastener as defined in claim 1 wherein the height of said lower coupling member is greater than the thickness of the stringer tape.

7. A sliding clasp fastener substantially as

herein described with reference to and as illustrated in the accompanying drawing.

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