

PATENT SPECIFICATION

(11) 1 478 256

1 478 256

- (21) Application No. 28464/75 (22) Filed 7 July 1975
 (31) Convention Application No. 49/084 261
 (32) Filed 16 July 1974 in
 (33) Japan (JA)
 (44) Complete Specification published 29 June 1977
 (51) INT CL⁷ A44B 19/06//19/04
 (52) Index at acceptance E2S 1A2A 1A2C



(54) 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 generally to sliding clasp fasteners and in particular to a sliding clasp fastener of the type having a pair of series of discrete fastener elements attached astride respective longitudinal beaded edges of a pair of carrier tapes.

In the production of sliding clasp fasteners of the type described, it is now the common practice to provide discrete fastener elements made of a metal, each of which elements comprises a coupling head and a pair of legs extending therefrom and flared outwardly to assume a substantially, cross-sectionally V-shaped contour. In order to attach the fastener elements to the carrier tape, the legs are arranged astride a longitudinal beaded edge of the tape and then pressed toward each other into gripping engagement with the beaded edge. However, the prior art legs were provided with a smooth peripheral inner wall having oppositely disposed portions in each pair that are adapted to grip the beaded edge of the carrier tape. This has led to the drawback that the fastener elements are liable to tilt relative to and disengage from the beaded edge when repeatedly subjected to severe external stresses tending to loosen the legs gradually out of firm gripping engagement with the beaded tape edge. Furthermore, under these conditions, the fastener elements are prone to be displaced along the longitudinal beaded edge of the tape with the results that the pitch of adjacent fastener elements is disturbed, failing to interlock the opposed stringers in an orderly manner. Various attempts have heretofore been made to explore more effective and secure attachment of the fastener elements to the beaded edge of the carrier tape.

One such attempt was to form alternate

elongated ridges on and grooves in the peripheral inner wall of the legs, which ridges and grooves extend pitchwise over the whole width of the element. However, this effort suffered the difficulty that the fastener elements are not fully prevented from being displaced along the longitudinal beaded edge of the tape. Another attempt involved the provision of a groove or recess extending in the peripheral inner wall of the legs and longitudinally of the element. This arrangement, however, cannot eliminate the tendency of the fastener elements to become displaced tiltingly relative to and finally disengaged from the beaded tape edge, and is further disadvantageous in that because the beaded tape edge when gripped by the element legs is bulged into the groove, it is necessary to use extra beading material of high bulk and resiliency to compensate for the room of such groove.

According to the invention, there is provided a sliding clasp fastener including a pair of oppositely disposed carrier tapes each carrying on and along one longitudinal beaded edge a series of discrete fastener elements, said fastener elements each comprising a coupling head, a pair of legs extending from the coupling head and having oppositely disposed inner wall portions, and a plurality of teeth formed integral with said legs and projecting from said oppositely disposed inner wall portions, said teeth being generally triangular in shape and smaller in width than said legs as measured along the longitudinal direction of said beaded edge, each of said teeth being at a predetermined pitch spacing with respect to a corresponding tooth on the other leg as measured along said longitudinal direction, said teeth being disposed in gripping engagement with said beaded edge to secure the fastener elements thereto.

The invention will be described by way of examples with reference to the accompanying drawings in which like reference numerals denote like parts throughout the several views, and wherein;

Figure 1 is a perspective view of an individual fastener element of a preferred

55

60

65

70

75

80

85

90

95

100

sliding clasp fastener according to the present invention;

Figure 2 is a top plan view of the fastener element shown in Figure 1;

5 Figure 3 is a cross-sectional view taken along the line III—III of Figure 2;

10 Figure 4 is a fragmentary plan view of a pair of fastener stringers shown in coupled condition, and having mounted thereon fastener elements each of which is as shown in Figures 1 to 3;

Figure 5 is a cross-sectional view taken along the line V—V of Figure 4;

15 Figure 6 is a view similar to Figure 3, but illustrating another embodiment of the invention; and

20 Figure 7 is a view similar to Figure 2, but showing a modified form of fastener element of a sliding clasp fastener according to the invention.

25 Referring now to the drawings and particularly to Figures 1 to 3, there is shown a fastener element or scoop generally designated at 10 which is formed by, for example, cutting a cross-sectionally Y-shaped bar made of a metal. The element 10 has a coupling head 11, and a pair of legs 12 and 13 extending from the coupling head 11 and flared outwardly in its initial form; i.e., prior to attachment to the tape, to assume a substantially, cross-sectionally V-shaped configuration. The legs 12 and 13 are provided with oppositely disposed inner wall portions 14 and 15, respectively, that are adapted to grip or clamp around a beaded edge 16 (Figure 4) when the legs 12 and 13 are pressed toward each other until they assume the position as indicated by the imaginary lines of Figure 2.

40 A tooth 17 of a cross-sectionally triangular shape is formed integral with the leg 12 and projects from the wall portion 14 toward the opposed leg 13.

45 A pair of similar teeth 18 and 19 of a cross-sectionally triangular shape are formed integral with the leg 13 and project from the wall portion 15 toward the opposed leg 12. Figure 3 shows that the width (I) of each of these teeth 17, 18 and 19 is smaller than the width of the respective one of the legs 12 and 13 of the element 10. As seen from Figures 1 and 3, the first tooth 17 is situated centrally of the width of the leg 12, whereas the twin teeth 18 and 19 are spaced apart from each other in the longitudinal direction of the carrier tape and located at the lateral marginal edges of the wall portion 15. It will be seen that the tooth 17 is placed, pitchwise of the element out of registry with the teeth 18 and 19 by a given distance P₁, so that the tooth 17 is opposed to an intermediate point between the teeth 18 and 19. It will be noted that when the legs 12 and 13 assume the position of imaginary lines of Figure 2, that is, the element 10 is

mounted astride the beaded tape edge 16, the tooth 17 is disposed in diametrically opposed relation to the opposed teeth 18, 19 as seen particularly in Figure 2.

70 Referring now to Figures 4 and 5, when the fastener elements 10 thus constructed are attached to the carrier tapes 20, the opposed wall portions 14 and 15 of the legs 12 and 13 are pressed against and around the beaded edges 16 extending longitudinally of the tapes 20 until the teeth 17, 18 and 19 are brought into engagement with and bite into the beaded edges 16. Since the tooth 17 and the opposed teeth 18, 19 are displaced pitchwise of the element from each other and engage with the beaded edge 16 at the diametrically opposed points, these teeth 17, 18 and 19 are held in firm biting engagement with the sandwiched beaded edge 16 as viewed in Figure 5. Accordingly, the fastener elements 10 are held stably in position on and around the beaded tape edge 16 against displacement which would otherwise occur pitchwise of the element or along the longitudinal beaded edge 16 under the influence of external stresses. It will also be noted that since the teeth 17, 18 and 19 are kept in firm, gripping engagement with the beaded edge 16, the fastener elements 10 are prevented from tilting relative to and disengaging from the beaded edge 16 even when repeatedly subjected to severe external stresses.

100 A close inspection of Figure 5 indicates that the beaded edge 16 engages firmly with only one tooth at any optional, cross-sectional plane of the beaded edge where the element is supported, thereby preventing the beaded edge 16 from being pressed excessively. With this structure, the beaded tape edges 16 can be fabricated of a less bulky and resilient textile material than those used in the prior art sliding clasp fasteners in which the beaded tape edge is clamped by two or more ridge and respectively one or more grooves of the elements at any one cross-sectional plane of the element-carrying beaded edge, or the beaded edge is bulged into a groove formed in and along the peripheral inner wall of the element legs.

110 Figure 6 shows another preferred embodiment of the invention wherein the wall portion 14 of the leg 12 is provided with three spaced teeth 21, 22 and 23, whereas the wall portion 15 of the leg 13 is provided with two spaced teeth 24 and 25. It will be appreciated that the teeth 21, 22 and 23 and the opposed teeth 24, 25 are displaced pitchwise of the element from each other so as to ensure more firm clamping engagement with the beaded tape edge 16.

125 According to the modification illustrated in Figure 7, the tooth 17 and the opposed teeth 18, 19 are further displaced from each

70

75

80

85

90

95

100

105

110

115

120

125

130

other in the longitudinal direction of the fastener element 10 by a given distance P_2 , so that when clamped around the beaded edge 16, the tooth 17 and the opposed teeth 5 18, 19 will be orientated out of registry with each other.

WHAT WE CLAIM IS:—

- 10 1. A sliding clasp fastener including a pair of oppositely disposed carrier tapes each carrying on and along one longitudinal beaded edge a series of discrete fastener elements, said fastener elements each comprising a coupling head, a pair of legs extending from the coupling head and 15 having oppositely disposed inner wall portions, and a plurality of teeth formed integral with said legs and projecting from said oppositely disposed inner wall portions, said teeth being generally triangular in 20 shape and smaller in width than said legs as measured along the longitudinal direction of

said beaded edge, each of said teeth being at a predetermined pitch spacing with respect to a corresponding tooth on the other leg as measured along said longitudinal direction, 25 said teeth being disposed in gripping engagement with said beaded edge to secure the fastener elements thereto.

2. A sliding clasp fastener substantially as herein described with reference to and as 30 illustrated in Figures 1 to 5 of the accompanying drawings.

3. A sliding clasp fastener substantially as herein described with reference to and as 35 illustrated in Figure 6 of the accompanying drawings.

4. A sliding clasp fastener substantially as herein described with reference to and as 40 illustrated in Figure 7 of the accompanying drawings.

MARKS & CLERK,
Chartered Patent Agents,
Agents for the Applicants.

other in the longitudinal direction of the fastener element 10 by a given distance P_2 , so that when clamped around the beaded edge 16, the tooth 17 and the opposed teeth 18, 19 will be orientated out of registry with each other.

WHAT WE CLAIM IS:—

1. A sliding clasp fastener including a pair of oppositely disposed carrier tapes each carrying on and along one longitudinal beaded edge a series of discrete fastener elements, said fastener elements each comprising a coupling head, a pair of legs extending from the coupling head and having oppositely disposed inner wall portions, and a plurality of teeth formed integral with said legs and projecting from said oppositely disposed inner wall portions, said teeth being generally triangular in shape and smaller in width than said legs as measured along the longitudinal direction of

said beaded edge, each of said teeth being at a predetermined pitch spacing with respect to a corresponding tooth on the other leg as measured along said longitudinal direction, said teeth being disposed in gripping engagement with said beaded edge to secure the fastener elements thereto.

2. A sliding clasp fastener substantially as herein described with reference to and as illustrated in Figures 1 to 5 of the accompanying drawings.

3. A sliding clasp fastener substantially as herein described with reference to and as illustrated in Figure 6 of the accompanying drawings.

4. A sliding clasp fastener substantially as herein described with reference to and as illustrated in Figure 7 of the accompanying drawings.

MARKS & CLERK,
Chartered Patent Agents,
Agents for the Applicants.

Printed for Her Majesty's Stationery Office by the Courier Press, Leamington Spa, 1977.
Published by the Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.



* C L M S *