

SLIDE FASTENER WITH A SEPARATOR

The present invention relates to slide fasteners with a separator and more particularly to a mounting construction of a pair of male and female members in the form of rod constituting the separator with
5 a pair of fastener stringers.

A conventional method for manufacturing a slide fastener with a separator is as follows :

- (1) an elongate slide fastener chain of a pair fastener stringers is prepared, each of said
10 fastener stringers having a fastener element in the form of coil secured along the one edge of a fastener tape by sewing threads. The coil element includes a core cord extending therewithin and the sewing thread pierces
15 the core cord so that the coil element is fixedly secured to the fastener tape;
- (2) a part of the length of the engaged coil elements is cut off by a predetermined length at a predetermined interval and is removed from
20 the fastener stringers whereby an area where no element is secured to the fastener stringers is formed; at this stage, the core cord remains in the area of the fastener stringer;
- (3) both the front and rear surfaces of said area are

lined with a reinforcement film by thermal fusion respectively and then this area is cut to a predetermined configuration; it should be noted that a core portion is formed at the said area by using the remaining core cord;

(4) the longitudinally extending fastener chain is cut to a predetermined length at the aforesaid area. Next, the pair of fasteners stringers are separated away from one another and a slider is fitted onto one of the fastener stringers;

(5) the core portion of the one fastener stringer is fitted with a male member and the core portion of the other one is fitted with a box having a female member formed integrally therewith. The box having the female member and male member are then fixed to the fastener stringers by caulking in a vertical direction.

Since with the conventional method as described above, the male and female members or the bar members are fitted to the core portion formed at the lower part of each of the fastener stringers without any aid of locating reference or guide, it has been often found that the bar members are fitted excessively far onto the core portion or by an excessively short distance. The side wall of the bar members should be located at a

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right angle relative to the reinforcement film but it is sometimes found that the bar members are turned or twisted about the axis extending in the longitudinal direction of the fastener stringers.

5 Any incorrect locating of the bar members causes the slider to be inhibited from smooth movement after male member is inserted into the box to which the female member is fixed, resulting in the production of failure.

10 The present invention has been made with the foregoing drawbacks inherent to the conventional mounting construction of the bar member in mind and it is believed possible by means of the invention to provide a mounting construction of the bar member with a
15 slide fastener having a separator attached thereto in which bar members can be fixedly secured to a pair of fastener stringers precisely at a high speed.

According to the present invention there is provided a slide fastener with a separator, comprising a pair of fastener stringers each of which has a fastener element in the form of coil fixedly sewn to the one side edge thereof with a core cord threaded therewithin; reinforcement films fused with the lower end portion each of the fastener stringers; a core portion of larger thickness than that of fastener tape on the extension of the core cord defining the outer side edge of the lower portion of the fastener stringers; and a female member, a male member and a box fixedly secured to the core portion of the fastener stringers, characterised in that a stepped portion is provided between the lowermost end of the fastener element and the core portion, said stepped portion extending outwardly beyond the core portion and in that each of the male member and female member formed with a slit-like engagement groove at its upper portion of the side wall open to the fastener stringer so that the stepped portion is adapted to come into contact with the engagement groove.

In a preferred embodiment of the invention, when the bar members are fitted onto each of the fastener stringers, they are displaced upward by causing the inner wall surface of each of the bar members to

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slide along the outer surface of the fastener stringers until each of the stepped portion on the fastener stringers comes in abutment against the deepest portion of the engagement groove on the bar members.

- 5 Further, since the position where the upward displacement of the bar member is stopped due to abutment of the stepped portion against the deepest point of the engagement groove is predetermined at a certain position, it is assured tht the bar member is
- 10 fitted onto each of the fastener stringers reliably and quickly. The arrangement made in that way makes it possible not only to correctly locate the bar member in the longitudinal direction relative to the fastener stringer but also to inhibit an
- 15 occurrence of turning movement of the bar member about the axis extending in the longitudinal direction of the fastener stringer.

The bar member in the preferred embodiment is firmly secured to each of the fastener stringers by

20 caulking in a vertical direction.

The invention will be described by way of example with reference to the accompanying drawings, wherein:

Fig. 1 is a fragmental plan view of one fastener stringer showing a male member separate therefrom;

- 25 Fig. 2 is a side view of the fastener stringer in Fig. 1;

Fig. 3 is a fragmental plan view of the fastener stringer in Fig. 1, fitted with the male member;

Fig. 4 is a side view of an assembly of the fastener stringer and the male member in Fig. 3;

5 Fig. 5 is a fragmental plan view of a separable slide fastener embodying the invention, with the fastener stringers engaged to one another in the closed state; and

Fig. 6 is a perspective view of a male member
10 to be fixed to the fastener stringer.

It should be noted that since the male and female members constituting the bar members have substantially the same configuration and have substantially the same essential parts, at least
15 so far as regards this invention, description will be made only with respect to the male member.

In the drawings reference numeral 1 designates a lefthand fastener stringer with a male member 7, to be described later, attached or to be attached
20 thereto. As is apparent from the drawings, a fastener element 2 in the form of a coil is fixedly secured to the righthand edge of the fastener stringer 1 by a sewing thread 4 as seen in Fig. 1. A core cord 3 extends within the coil element 2 in a
25 longitudinal direction and the sewing thread 4 pierces the core so that the fastener element 2 is fixedly secured to the fastener stringer 1.

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The cut reversed connecting portion 2_a of the lowermost end of the coil element 2 is fused with the fastener stringer.

Further, both the upper and lower surfaces of the fastener stringer 1 are lined with a reinforcement film 5 at its lower end part by thermal fusion respectively and thereafter it is cut to a predetermined configuration. In the preferred form shown in the drawings, the lower end part of the fastener stringer 1 is cut to substantially an L-configuration. Since the fastener element 2 under the reversed connecting portion 2_a is removed from the fastener stringer 1 and the core cord 3 remains on the stringer 1, a core portion 6 of larger thickness than that of the fastener tape projecting from the surface of the reinforcement film 5 is formed by using the remaining core cord 3 when the reinforcement film 5 is fused with the lower end of the stringer 1 and the stringer 1 is cut in a predetermined configuration. The core portion 6 also defines the side edge of the lower end part of the fastener stringer 1. The core portion 6 is formed on the extension of the core cord 3 extending continually with the fastener element 2 and acts as a mounting means for the male 7 hereunder described. A stepped portion 1_a of the stringer 1 is formed between the lowermost end portion of the fastener element 2 and the upper end of the core portion 6 and extends outwardly beyond the outer core of

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the core portion 6.

Reference numeral 7 designates a male member having a substantially U-shaped cross sectional configuration. The male member is made of upper wall 7_b , lower wall 7_c , and side wall 7_d as shown in Fig. 6. The upper portion of the side wall 7_d is formed with a slit-like engagement groove 7_a open to the fastener element 2. The engagement groove 7_a is adapted to come into engagement with the stepped portion 1_a of the fastener stringer 1. In the preferred form of the present invention as shown, the engagement groove 7_a is formed to U-shape. The length L_1 of the male member 7 in a longitudinal direction is substantially equal to the length L_2 between the lowermost portion of the fastener element 2 and the lower end of the core cord 6. And the length ℓ_1 between the upper end of the male member 7 and the deepest point of the engagement groove 7_a is substantially equal to the length ℓ_2 between the lowermost portion of the fastener element 2 and the shoulder formed at the lower end of the stepped portion 1_a . Therefore, the male member 7 is correctly attached to the fastener stringer 1, when the shoulder of the stepped portion 1_a is engaged with the deepest point of the engagement groove 7_a . At this time, the upper end surface of the male member 7 abuts against the lowermost portion of the fastener element 2. When the male

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member 7 is fitted to the lower end portion of the fastener stringer 1, the male member 7 is inserted over the core portion 6 in the direction as identified with an arrow shown in Fig. 1, while the inner surface of the male member 7 is guided by the core portion 6. In the last step of insertion, the engagement groove 7_a formed in the side wall 7_b of the male member 7 is guided by the stepped portion 1_a of the fastener stringer 1, and insertion of the male member 7 is finally caused to stop when the shoulder formed at the lower end of the stepped portion 1_a abuts against the deepest point of the engagement groove 7_a. After that the male member 7 is fixedly secured to the fastener stringer 1 by caulking the upper wall 7_b and lower wall 7_c or by notch-like finger formed on the upper wall and lower wall. Incidentally, Fig. 3 is a fragmental plan view which illustrates how the male member 7 is fixedly secured to the fastener stringer 1 and Fig. 4 is a side view of the fastener stringer 1 with the male 7 firmly secured thereto.

As will be readily understood from the above description, the mounting construction of male member with the slide fastener with a separator attached thereto ensures the correct positioning of the male member with respect to the fastener stringer by providing the slot-like engagement groove with the upper portion of the side wall of the male member constituting a part



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of the bar member and by providing the stepped portion
1_a with the fastener stringer thereby contacting the former
with the latter. Further, since the male member 7 is
inhibited from turning movement about the axis extending
5 in the longitudinal direction of the fastener stringer,
there is no fear of causing an occurrence of incorrect
locating, twisting or the like of the male member 7
relative to the female member 9 after it is inserted
into the box 8 so as to close a fastener chain as
10 illustrated in Fig. 5.

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Claims:

1. A slide fastener with a separator, comprising a pair of fastener stringers each of which has a fastener element in the form of coil fixedly sewn to the one side edge thereof with a core cord threaded therewithin; reinforcement films fused with the lower end portion each of the fastener stringers; a core portion of larger thickness than that of fastener tape on the extension of the core cord defining the outer side edge of the lower portion of the fastener stringers; and a female member, a male member and a box fixedly secured to the core portion of the fastener stringers, characterised in that a stepped portion is provided between the lowermost end of the fastener element and the core portion, said stepped portion extending outwardly beyond the core portion and in that each of the male member and female member is formed with a slit-like engagement groove at its upper portion of the side wall open to the fastener stringer so that the stepped portion is adapted to come into contact with the engagement groove.

2. A slide fastener according to Claim 1 wherein the engagement groove is formed to substantially a U-shape.

3. A slide fastener according to Claim 1 or 2 wherein the length of the bar member is substantially equal to the length between the lowermost end of the fastener element and the lower end of the core portion,



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and the length between the upper end of the bar member and the deepest point of the engagement groove is substantially equal to the longitudinal length of the stepped portion between the lowermost end of the fastener element and a shoulder formed at the lower end thereof.

4. A slide fastener according to Claim 1, 2 or 3 wherein the male member, the female member and the box are fixedly secured to the lower part of the fastener stringers by caulking operation.

5. A slide fastener according to claim 1, 2 or 3 wherein the male member, the female member and the box are fixedly secured to the lower part of the fastener stringers by notch-like fingers.
