

PATENT SPECIFICATION

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(54) TOP STOPS FOR SLIDING CLASP FASTENERS

(71) We, YOSHIDA KOGYO K.K., a corporation duly organised under the laws of Japan and existing at No. 1, Kanda Izumi-cho, 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:—

10 This invention relates generally to sliding clasp fasteners and more specifically to a pair of top stops for limiting the movement of a slider in the fastener closing direction on a pair of fastener stringers. Still more specifically, the invention deals with top stops for use in a sliding clasp fastener of the type having continuous coupling elements arranged along the opposed longitudinal edges of respective stringer tapes.

20 The top stops as heretofore constructed and arranged are usually affixed directly to the upper extremities of the respective coupling elements or to the stringer tapes just above the upper extremities of the coupling elements. Mostly, these prior art top stops are not sufficiently stably supported to resist the thrust of the slider that acts repeatedly thereon in the use of the sliding clasp fastener. Such top stops are therefore relatively easy to be displaced, deformed, or detached from the fastener stringers, thereby failing to stop the slider exactly at the end of its fastener closing movement.

35 The present invention seeks to provide an improved construction and arrangement of top stops, such that the top stops can be securely supported in prescribed positions on respective fastener stringers in spite of the thrust of the slider acting thereon throughout a prolonged period of use of the sliding clasp fastener.

45 According to the invention, there is provided a sliding clasp fastener comprising a pair of stringers each having a tape with

a continuous coupling element secured along one of its longitudinal edges opposed to the other stringer tape, said continuous coupling element having a series of transverse portions each with a coupling head at one end and a series of connective portions arranged remote from the coupling heads, a slider slidable along said continuous coupling elements to open or close the sliding clasp fastener, and a pair of support members of resilient plastics material overlying and uniting with several of said connective portions, including the uppermost ones, of said continuous coupling elements, respectively, and a pair of top stops each in the form of a strip of metal which are secured to said stringers by clamping engagement of said stringer tapes and said support members, respectively, to limit the movement of said slider along said continuous coupling elements in the fastener closing direction, each of said top stops being received between two adjacent transverse portions of the respective continuous coupling element.

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

Figure 1 is a partial top plan view of a sliding clasp fastener incorporating preferred top stops according to the invention, in which the slider is shown in its uppermost position on the pair of fastener stringers and in which the slider is shown with its front wing cut away to clearly reveal the relations between the top stops, the fastener stringers and the slider;

Figure 2 is a partial top plan view of one of the fastener stringers, complete with its top stop, shown in Figure 1;

Figure 3 is a sectional view taken along the plane of line III-III in Figure 2; and Figure 4 is a view similar to Figure 2

but showing another preferred embodiment of the invention.

Figure 1 illustrates the general organization of a sliding clasp fastener for which preferred top stops according to this invention are particularly well adapted. The illustrated sliding clasp fastener comprises a pair of stringers 10 which include tapes 11 carrying continuous coupling elements 12 along their opposed longitudinal edges, and a slider 13 slidable along the continuous coupling elements to open and close the fastener.

Each continuous coupling element 12 can be in the form of a coil or helix of a synthetic resin filament as shown and is stitched at 14 to one surface only of each stringer tape 11. The continuous coupling element comprises a series of constantly spaced ladder-like transverse portions 15 each with a coupling head 16 arranged at one end for engagement between the identical coupling heads of the companion coupling element, and a series of connective portions 17 arranged remote from the coupling heads and serving to connect the adjacent transverse portions.

The slider 13 can be of the usual type having a body which comprises front and back wings interconnected by a web or neck 18 located centrally at the flared top end of the slider body. The front and back wings and the web 18 are so arranged as to define a Y-shaped guide channel through which the coupling elements 12 are adapted to pass. The front wing has a pair of side flanges 19 which serve as guides for the coupling elements. It will be noted from Figure 1 that the side flanges 19 include divergent portions 20 adjacent the flared top end of the slider body and parallel portions 21 adjacent its contracted bottom end.

The general organization of the illustrated sliding clasp fastener, as so far set forth, had been well known in the art.

As illustrated in Figures 1, 2 and 3, the invention provides a pair of structurally similar metal-made top stops 22 mounted adjacent the top ends of the respective stringers 10 via support members 23 of plastics material each overlying and substantially integrally uniting with several of the connective portions 17, including the uppermost one, of the continuous coupling element 12. Preferably, the support members 23 should be of thermoplastic synthetic resin, so that each member can be fused to the several connective portions of the continuous coupling element as by a known high-frequency or ultrasonic welding techniques. Also, each of the support members can be fused to a tape end covering 11' of thermoplastic synthetic resin as shown in Figure 3.

Each top stop 22 is in the form of a strip of metal, with a width to fit neatly between two adjacent transverse portions 15 of the continuous coupling element 12. As will be best understood from Figure 3, each metal-made top stop 22 is received between two adjacent transverse portions 15 of the continuous coupling element and is secured in position by clamping or gripping engagement of the stringer tape 11 and the support member 23. By the term "clamping engagement" is also meant an arrangement in which the metal-made top stop has pointed or tapered ends 22' that are held in biting engagement with the tape end covering 11' (Figure 3) or are driven through the stringer tape and perhaps clinched. Since the top stops 22 are firmly clamped onto the respective stringers 10 by utilizing the inherent resiliency of synthetic resin or the like of which the support members 23 are made, the top stops 22 are effectively protected against displacement, detachment or damage resulting from the repeated thrust of the slider 13 in the use of the complete sliding clasp fastener.

Thus, when the slider 13 is moved along the continuous coupling elements 12 in the fastener closing direction to the predetermined uppermost position on the pair of stringers 10, as illustrated in Figure 1, the top stops 22 as well as their support members 23 enter relatively into the slider body. The fastener closing movement of the slider 13 is arrested in its uppermost position, in which the top stops 22 abut against the respective divergent portions 20 of the slider side flanges 19 and in which the top stops together with their support members are thoroughly concealed within the slider body.

Figure 4 illustrates another preferred embodiment of the invention, in which each support member 23a has a step 24 on its edge away from the element carrying edge of the stringer tape 11. This step 24 is adapted to engage the top stop 22, in such a manner that the latter is even more positively restrained from upward displacement resulting from the thrust of the slider. Other details of construction and operation are exactly as above stated with reference to Figures 1, 2 and 3.

WHAT WE CLAIM IS:

1. A sliding clasp fastener comprising a pair of stringers each having a tape with a continuous coupling element secured along one of its longitudinal edges opposed to the other stringer tape, said continuous coupling element having a series of transverse portions each with a coupling head at one end and a series of connective portions arranged remote from the coupling heads, a slider slidable along said continuous coupling elements to open or close the

but showing another preferred embodiment of the invention.

Figure 1 illustrates the general organization of a sliding clasp fastener for which preferred top stops according to this invention are particularly well adapted. The illustrated sliding clasp fastener comprises a pair of stringers 10 which include tapes 11 carrying continuous coupling elements 12 along their opposed longitudinal edges, and a slider 13 slidable along the continuous coupling elements to open and close the fastener.

Each continuous coupling element 12 can be in the form of a coil or helix of a synthetic resin filament as shown and is stitched at 14 to one surface only of each stringer tape 11. The continuous coupling element comprises a series of constantly spaced ladder-like transverse portions 15 each with a coupling head 16 arranged at one end for engagement between the identical coupling heads of the companion coupling element, and a series of connective portions 17 arranged remote from the coupling heads and serving to connect the adjacent transverse portions.

The slider 13 can be of the usual type having a body which comprises front and back wings interconnected by a web or neck 18 located centrally at the flared top end of the slider body. The front and back wings and the web 18 are so arranged as to define a Y-shaped guide channel through which the coupling elements 12 are adapted to pass. The front wing has a pair of side flanges 19 which serve as guides for the coupling elements. It will be noted from Figure 1 that the side flanges 19 include divergent portions 20 adjacent the flared top end of the slider body and parallel portions 21 adjacent its contracted bottom end.

The general organization of the illustrated sliding clasp fastener, as so far set forth, had been well known in the art.

As illustrated in Figures 1, 2 and 3, the invention provides a pair of structurally similar metal-made top stops 22 mounted adjacent the top ends of the respective stringers 10 via support members 23 of plastics material each overlying and substantially integrally uniting with several of the connective portions 17, including the uppermost one, of the continuous coupling element 12. Preferably, the support members 23 should be of thermoplastic synthetic resin, so that each member can be fused to the several connective portions of the continuous coupling element as by known high-frequency or ultrasonic welding techniques. Also, each of the support members can be fused to a tape end covering 11' of thermoplastic synthetic resin as shown in Figure 3.

Each top stop 22 is in the form of a strip of metal, with a width to fit neatly between two adjacent transverse portions 15 of the continuous coupling element 12. As will be best understood from Figure 3, each metal-made top stop 22 is received between two adjacent transverse portions 15 of the continuous coupling element and is secured in position by clamping or gripping engagement of the stringer tape 11 and the support member 23. By the term "clamping engagement" is also meant an arrangement in which the metal-made top stop has pointed or tapered ends 22' that are held in biting engagement with the tape end covering 11' (Figure 3) or are driven through the stringer tape and perhaps clinched. Since the top stops 22 are firmly clamped onto the respective stringers 10 by utilizing the inherent resiliency of synthetic resin or the like of which the support members 23 are made, the top stops 22 are effectively protected against displacement, detachment or damage resulting from the repeated thrust of the slider 13 in the use of the complete sliding clasp fastener.

Thus, when the slider 13 is moved along the continuous coupling elements 12 in the fastener closing direction to the predetermined uppermost position on the pair of stringers 10, as illustrated in Figure 1, the top stops 22 as well as their support members 23 enter relatively into the slider body. The fastener closing movement of the slider 13 is arrested in its uppermost position, in which the top stops 22 abut against the respective divergent portions 20 of the slider side flanges 19 and in which the top stops together with their support members are thoroughly concealed within the slider body.

Figure 4 illustrates another preferred embodiment of the invention, in which each support member 23a has a step 24 on its edge away from the element carrying edge of the stringer tape 11. This step 24 is adapted to engage the top stop 22, in such a manner that the latter is even more positively restrained from upward displacement resulting from the thrust of the slider. Other details of construction and operation are exactly as above stated with reference to Figures 1, 2 and 3.

WHAT WE CLAIM IS:

1. A sliding clasp fastener comprising a pair of stringers each having a tape with a continuous coupling element secured along one of its longitudinal edges opposed to the other stringer tape, said continuous coupling element having a series of transverse portions each with a coupling head at one end and a series of connective portions arranged remote from the coupling heads, a slider slidable along said continuous coupling elements to open or close the



sliding clasp fastener, and a pair of support members of resilient plastics material overlying and uniting with several of said connective portions, including the uppermost 5 ones, of said continuous coupling elements, respectively, and a pair of top stops each in the form of a strip of metal which are secured to said stringers by clamping engagement of said stringer tapes and said 10 support members, respectively, to limit the movement of said slider along said continuous coupling elements in the fastener closing direction, each of said top stops being received between two adjacent transverse 15 portions of the respective continuous coupling element.

2. A sliding clasp fastener as claimed in claim 1, wherein each of said support members includes a step on its edge away

from said one longitudinal edge of the 20 stringer tape, said step being adapted to engage said top stop whereby the latter is even more positively restrained from displacement resulting from the thrust of said slider acting thereon. 25

3. A sliding clasp fastener as claimed in claim 1, in which each of said support members is made of thermoplastic synthetic resin, and in which each of said support members is fused to said several connective 30 portions.

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

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