

PATENT SPECIFICATION

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(54) TOP STOPS FOR SLIDING CLASP FASTENERS

(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:—

10 This invention relates generally to sliding clasp fasteners and more specifically to a cooperative pair of top stops for arresting the movement of a slider in a fastener closing direction on a pair of fastener stringers. Even more specifically, the invention is directed to top stops for use in a sliding clasp fastener of the type having a continuous coupling element which is made of an elongate synthetic resin filament and which is stitched or otherwise secured longitudinally to one surface of each stringer tape.

25 According to an example of known top stops for sliding clasp fasteners, the endmost fastener element on each stringer tape is fused and deformed into such shape as to arrest the movement of the slider. It is also known to fuse film-like pieces of thermoplastic material onto the respective stringer tapes, generally in V-shaped arrangement. These prior art top stops are mostly not of sufficient strength 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 broken or otherwise rendered inoperable or are not so

40 According to the invention, there is provided sliding clasp fastener comprising a pair of stringer tapes each having a continuous coupling element arranged on one surface thereof so as to extend along its one longitudinal edge adjacent the other stringer tape, said coupling element being made of a synthetic resin filament and including a series of coupling heads arranged along one longitudinal edge of the coupling element and a series of connective

portions arranged along the other longitudinal edge of the coupling element, said coupling heads being adapted to engage between the similar coupling heads of the other coupling element, and a slider slidable along said coupling elements and including a body having a flared top end and a contracted bottom end, said slider body including a front wing and a back wing which are interconnected by a web located at said flared top end, said front wing of said slider body having a pair of side flanges, the combination thereof with a pair of top stops made of synthetic resin material and fused to said stringer tapes at the upper extremities of said coupling elements, respectively, each of said top stops integrally comprising a stop portion against which the top edge of one of said side flanges of said front wing abuts when said slider is moved along said continuous coupling elements to its predetermined topmost position on the sliding clasp fastener, and a guide portion which is substantially in the shape of a right-angled triangle as seen in a plan view and which generally tapers in a direction away from the top end of the sliding clasp fastener, said guide portion being adapted to enter relatively into said slider body through said flared top end when said slider is moved close to said predetermined topmost position and hence to guide said slider to said predetermined topmost position, said stop portion of each top stop being substantially rectangular in shape and being greater than said guide portion both in height and in a dimension in a transverse direction of the stringer tape, said stop portion and said guide portion of each top stop enveloping and uniting integral with several of said connective portions, including the topmost one, of the corresponding coupling element.

The invention will be described by way of example with reference to the accompanying drawings which illustrate a preferred embodiment of the invention and in which

like reference characters denote corresponding parts of the several views, and wherein;

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

Figure 2 is a perspective view of one of the fastener stringers shown in Figure 1; and

Figure 3 is a sectional view taken along the plane of line III—III in Figure 1.

Figure 1 best illustrates the general organization of a sliding clasp fastener for which top stops in accordance with this invention are particularly well adapted. The illustrated sliding clasp fastener comprises a pair of stringers 10 and a slider 11. Each stringer 10 has a tape 12 with a continuous coupling element 13 arranged along one of its longitudinal edges opposed to the corresponding edge of the other stringer tape.

Each continuous coupling element 13 is substantially in the form of a coil or helix of a synthetic resin filament and is secured to one surface only of each stringer tape 12 by a line of stitching 14 with the aid of a core member 15 extending longitudinally through the coupling element. The continuous coupling element 13 comprises a series of uniformly intersticed coupling heads 16 arranged along one of the longitudinal edges thereof for engagement between the similar coupling heads of the complementary coupling element, and a series of connective portions 17 arranged along the other longitudinal edge of the coupling element.

The slider 11, slidable along the pair of continuous coupling elements 13 in either direction to open or close the fastener, has a body comprising a front wing 18 and a back wing 19 which are interconnected by a web 20, as will be seen by referring also to Figure 3. The wings 18 and 19 and the web 20 define the usual Y-shaped guide channel through which the coupling elements 13 are adapted to pass. The front wing 18 has a pair of side flanges 21 which serve as guides for the coupling elements. It will be noted from Figure 1 that the side flanges 21 include divergent portions 22 adjacent the flared top end 23 of the slider body and parallel portions 24 adjacent the contracted bottom end 25 of the slider body.

The general organization of the illustrated sliding clasp fastener, as so far described, has been well known in the art and

constitutes, by itself, no feature of this invention.

A cooperative pair of structurally similar top stops 26 are fixedly mounted on the respective stringers 10 at or adjacent their opposed longitudinal edges and at the upper extremities of the respective continuous coupling elements 13. For the formation of each top stop 26, a chip or sheet of nylon or like synthetic resin material is placed in the specified position on each stringer 10, so as to partly overlie several of the connective portions 17, including the topmost one, of the continuous coupling element 13. The chip or the like is then fused under application of pressure, as by the known high-frequency or ultrasonic welding techniques, in such a fashion that the resulting top stop 26 envelops and unites integral with the several connective portions 17 of the coupling element.

Each top stop 26 thus molded and fused to the stringer tape 12 is formed, as the same time, with a guide portion 27, a stop portion 28 and a flat base portion 29. The guide portion 27 is substantially in the shape of a right-angled triangle when seen in a plan view as shown in Figure 1, with a sloping guide edge or surface 30 located remote from the element carrying edge of the stringer tape 12, and generally tapers in a direction away from the top end of the fastener. The stop portion 28 is substantially rectangular in shape, is greater in height and in a dimension in the transverse direction of the tape (see Figure 2), and is located immediately on the fastener-top-end side of the guide portion 27. As mentioned previously, these guide portion 27 and stop portion 28 of each top stop 26 envelop and unite integral with the several connective portions 17, including the topmost one, of the corresponding continuous coupling element 13.

It will be observed from a consideration of Figures 1 and 2 that at least the topmost coupling head of each continuous coupling element 13, which head is transversely aligned with the stop portion 28 of each top stop 26, is removed from the coupling element. It is unnecessary to remove the coupling heads transversely aligned with the guide portions 27 of the top stops.

In operation, when the slider 11 slides along the continuous coupling elements 13 on its fastener closing movement to the topmost position on the pair of stringers 10, the guide portions 27 of the top stops 26 first enter relatively into the slider body through its flared top end 23. As the divergent portions 22 of the side flanges 21 of the slider body slide along the respective sloping guide edges 30 of the guide portions 27, the slider 11 can be positively guided to

its predetermined topmost position shown in Figures 1 and 3, in which position the top edges of the side flanges 21 abut against the respective stop portions 28 of the top stops.

- 5 It may be worth mentioning that since the stop portions 28 of the top stops are by far the most conspicuous members on the stringer tapes 12 because of their extra height and transverse dimension, their positions on the stringer tapes can be visually ascertained in a simple and accurate manner, so that a border line 28a extending transversely and defined between the guide portion 27 and the stop portion 28 of each top stop 26 serves as a reference point in correctly positioning the top stop 26 with respect to a preceding or first coupling element 13a on each of the stringer tapes in the assembling process of sliding clasp fasteners.

WHAT WE CLAIM IS:—

1. A sliding clasp fastener comprising a pair of stringer tapes each having a continuous coupling element arranged on one surface thereof so as to extend along its one longitudinal edge adjacent the other stringer tape, said coupling element being made of a synthetic resin filament and including a series of coupling heads arranged along one longitudinal edge of the coupling element and a series of connective portions arranged along the other longitudinal edge of the coupling element, said coupling heads being adapted to engage between the similar coupling heads of the other coupling element, and a slider slidable along said coupling elements and including a body having a flared top end and a contracted bottom end, said slider body including a front wing and a back wing which are interconnected by a web located at said flared top end, said front wing of said slider body having a pair of side flanges, the combination thereof with a pair of top stops made of synthetic resin material and fused

to said stringer tapes at the upper extremities of said coupling elements, respectively, each of said top stops integrally comprising a stop portion against which the top edge of one of said side flanges of said front wing abuts when said slider is moved along said continuous coupling elements to its predetermined topmost position on the sliding clasp fastener, and a guide portion which is substantially in the shape of a right-angled triangle as seen in a plan view and which generally tapers in a direction away from the top end of the sliding clasp fastener, said guide portion being adapted to enter relatively into said slider body through said flared top end when said slider is moved close to said predetermined topmost position and hence to guide said slider to said predetermined topmost position, said stop portion of each top stop being substantially rectangular in shape and being greater than said guide portion both in height and in a dimension in a transverse direction of the stringer tape, said stop portion and said guide portion of each top stop enveloping and uniting integral with several of said connective portions, including the topmost one, of the corresponding coupling element.

2. A sliding clasp fastener as claimed in claim 1, wherein at least the topmost one of said coupling heads of each coupling element, which is transversely aligned with said stop portion of each top stop, is removed from the coupling element.

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

MARKS & CLERK,
Chartered Patent Agents,
57—60 Lincolns Inn Fields,
London, WC2A 3LS.
Agents for the Applicants.

its predetermined topmost position shown in Figures 1 and 3, in which position the top edges of the side flanges 21 abut against the respective stop portions 28 of the top stops.

5 It may be worth mentioning that since the stop portions 28 of the top stops 70 are by far the most conspicuous members on the stringer tapes 12 because of their extra height and transverse dimension, their

10 positions on the stringer tapes can be visually ascertained in a simple and accurate manner, so that a border line 28a extending transversely and defined between the guide portion 27 and the stop portion 28 of each

15 top stop 26 serves as a reference point in correctly positioning the top stop 26 with respect to a preceding or first coupling element 13a on each of the stringer tapes in the assembling process of sliding clasp

20 fasteners.

WHAT WE CLAIM IS:—

1. A sliding clasp fastener comprising a pair of stringer tapes each having a continuous coupling element arranged on one surface thereof so as to extend along its one longitudinal edge adjacent the other stringer tape, said coupling element being made of a synthetic resin filament and including a series of coupling heads arranged along one longitudinal edge of the coupling element and a series of connective portions arranged along the other longitudinal edge of the coupling element, said coupling heads being adapted to engage between the similar coupling heads of the other coupling element, and a slider slidable along said coupling elements and including a body having a flared top end and a contracted bottom end, said slider

25 body including a front wing and a back wing which are interconnected by a web located at said flared top end, said front wing of said slider body having a pair of side flanges, the combination thereof with a pair of top stops

30 made of synthetic resin material and fused

to said stringer tapes at the upper extremities of said coupling elements, respectively, each of said top stops integrally comprising a stop portion against which the top edge of one of said side flanges of said front wing abuts when said slider is moved along said continuous coupling elements to its predetermined topmost position on the sliding clasp fastener, and a guide portion which is substantially in the shape of a right-angled triangle as seen in a plan view and which generally tapers in a direction away from the top end of the sliding clasp fastener, said guide portion being adapted to enter relatively into said slider body through said flared top end when said slider is moved close to said predetermined topmost position and hence to guide said slider to said predetermined topmost position, said stop portion of each top stop being substantially rectangular in shape and being greater than said guide portion both in height and in a dimension in a transverse direction of the stringer tape, said stop portion and said guide portion of each top stop enveloping and uniting integral with several of said connective portions, including the topmost one, of the corresponding coupling element.

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2. A sliding clasp fastener as claimed in claim 1, wherein at least the topmost one of said coupling heads of each coupling element, which is transversely aligned with said stop portion of each top stop, is removed from the coupling element.

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

MARKS & CLERK,
Chartered Patent Agents,
57—60 Lincolns Inn Fields,
London, WC2A 3LS.
Agents for the Applicants.

