

PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

End Stop for a Sliding Clasp Fastener

We, YOSHIDA KOGYO K.K., a Corporation organised under the Laws of Japan, of 11 Nihonbashi - Bakurocho - 4 - chome, Chuo-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:—

The present invention relates to end stops for sliding clasp fasteners.

In the past, end stops for such fasteners have generally included a socket member of a box-like configuration fixed to the tape of one of the fastener stringers and a plug member, to be inserted into the socket member, and attached to the tape of the other fastener stringers. The stringers are joined to each other at the end by inserting the plug member into the socket member from the top side. This type of end stop has inherent disadvantages in that its operation is somewhat complicated and the interengagement of the two members when the fastener is closed is not satisfactorily firm and tends to allow relative movement between the two members and hence between the interconnected fabric tapes.

An object of the invention is to provide an end-stop whereof, the interlocking elements interengage with exceptional firmness when the fastener is closed and are not movable relative to each other when interconnected, but in which the interlocking elements are quite easily and quickly connectable and disconnectable.

According to one aspect of the present invention an end stop for a sliding clasp fastener of the kind which incorporates a slider for connecting two sets of interconnecting elements, the end stop comprising a pair of co-operating members one for each of adjacent ends of the sets of elements, the first member affording a laterally opening

slot extending in the general direction of movement of the slider, the slot being adapted laterally to receive a projection of the second member, co-operating parts on the two members which laterally overlap after the first member is inserted into the second member and moved longitudinally relatively thereto, and a shoulder on one member arranged to be engaged laterally by one of the elements of the set to which the other member is to be connected after said longitudinal movement to prevent lateral disengagement of the members.

The first and second members conveniently have engaging surfaces which are inclined to the said direction of movement.

According to another aspect of the present invention a sliding clasp fastener includes an end stop formed by a pair of male and female interengageable elements attached to respective tapes which are to be releasably interconnected by fastening elements on the tapes; said male element including a column portion having a front face, an anchoring portion on top of said column portion formed with a curved recess to receive an engaging lug of one of the fastening elements, and a hook portion beneath the column portion formed with shoulders on opposite sides, said female element including a groove formed complementally to said column portion of said male element and a jaw portion adapted to interengage with said hook portion of said male element, said male and female elements being releasably connectable with each other through a slot formed in one side of a slider adapted to interconnect the fastening elements.

The invention may be carried into practice in various ways but one specific embodiment will now be described by way of example with reference to the accompanying drawings, in which:—

Figure 1 is a fragmentary front elevation

of a sliding clasp fastener fitted with an end stop embodying the present invention;

5 Figure 2 is a fragmentary perspective view of the male element of the end stop as attached to the associated fabric tape of the sliding clasp fastener;

Figure 3 is a view similar to Figure 2 of the female element as attached to the associated fabric tape; and

10 Figure 4 is a fragmentary perspective view showing the relation between the female element and the slider member of the sliding clasp fastener immediately before the male element is inserted into the female element.

15 In the drawing, there is shown an end stop of a sliding clasp fastener according to the present invention which comprises a male element 2 and a female element 3 attached to the bottom ends of the respective fabric tapes 1 and 1a of a slide fastener. The male element 2 is preferably an integral moulded member and comprises a body portion 4 in the form of a column having a thickness increasing rearwardly from its front face 4a, which is inclined forwardly downwardly, as best shown in Figure 2. The male element 2 also comprises a hook portion 5 and an anchoring portion 6, which are formed integrally with the body portion 4 at opposite ends thereof. The hook portion 5 extends beyond the body portion 4 on opposite sides thereof forming shoulders m extending in opposite directions from the bottom end of the column portion 4 as shown. The anchoring portion 6 includes a curved recess n formed at the front end thereof adjacent the top of the body portion 4. The female element 3 is preferably an integral moulded member and comprises a jaw portion 7 shaped complementally to the hook portion 5 of the male element to interengage therewith and a slide-supporting body portion 9 having a groove 10 formed in its front face to receive the column portion 4 of the male element 2, as best shown in Figure 3. The groove 10 is shaped complementally to the column portion 4 of the male element, or it has a width decreasing toward its bottom wall, which forms a surface 10a inclined downwardly inwardly. The jaw portion 7 extends beyond the body portion 9 on opposite sides thereof to form shoulders 8 for supporting the slide member at its bottom when it is in its lowest position.

55 In use, the end stop is operated as follows. To close the sliding clasp fastener by interengaging the two component elements of the device attached to the respective fabric tapes of the fastener, the slider S slidably mounted on the fastener for connecting and disconnecting the fastening elements is moved downwardly until the bottom of the slider S abuts against the shoulders 9 on the female element 3 (Figure 4) and then the male element 2 is fitted to the female element 3 by

inserting the column portion 4 of the former into the groove 10 formed in the slide-supporting body portion 9 of the latter now held in the slider S through the slot A formed in one side thereof until the inclined front face 4a of the column portion 4 engages the inclined bottom wall surface 10a of the groove 10. The male element is then pushed upwardly to slide relative to the female element under the guiding effect of the interengaging surfaces 4a and 10a of the column portion 4 and the grooved portion 9 of the respective elements 2 and 3 until the hook portion 5 of the male element 2 is slid into the complementally shaped jaw portion 7 of the female element 3 thus to hold the two elements in predetermined interlocking position. At the same time, the anchoring portion 6 of the male element 2 is positioned to project upwardly beyond the grooved portion 9 of the female element 3 so that the curved recess n formed in the anchoring portion 6 interfits with the engaging lug of the lowest one of the fastening elements carried by the fabric tape to the bottom of which the female element 3 is attached. As a result, it will be appreciated that the rows of fastening elements carried by the respective fabric tapes of the fastener are placed relative to each other in normal interengaging positions facilitating the closing of the slide fastener upon manual sliding movement of the slide member. It will also be appreciated that the interfitting relation between the anchoring portion 6 of the male element and the lowest fastening element E helps to ensure firm and positive interengagement between the male and female elements of the end stop holding these elements against any movement relative to each other.

105 In disengaging the fastener, the above described sequence of operation is followed reversewise. First, the slider S is moved slidably to release the interengagement between the rows of fastening elements until the bottom of the slide abuts against the shoulders 8 formed on the female element 3 of the end stop. The male element 2 of this device is then pulled laterally and downwardly relative to the female element until the hook portion 5 of the male element is slid out of the complemental recess formed in the jaw portion 7 of the female element. The male element may thus readily be disengaged from the female element to be withdrawn outwardly through the side slot A formed in the slide member allowing the fabric tapes of the slide fastener to be completely separated from each other.

125 As apparent from the foregoing description, the end stop of the present invention is constructed and arranged so as to be readily engaged and disengaged through the side slot A formed in the slide member of the fastener. Also, unlike conventional ones,

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the interlocking device may be made in a compact form having an appearance harmonized with that of fastening elements of the associated fastener.

- 5 The end stop is of a construction which enables its two component elements to be positively and completely interlocked eliminating the danger that the elements be accidentally disengaged from or rocked relative to each other in some direction or other. More specifically, the male and female elements of the end stop are so constructed and arranged that they may interengage with each other in a manner such that any force tending to move the elements laterally away from each other is effectively resisted by the interlocking engagement between the hook portion 5 and the jaw portion 7 of the respective elements 2 and 3; that any force tending to cause relative vertical movement between the two elements is effectively resisted by the engagement of the shouldered portion *m* of the male element with the jaw portion 7 of the female element and also by the engagement of the anchoring portion 6 of the male element with the top surface of slide-supporting body portion 9 of the female element 3; and that any relative rocking movement between the two elements is effectively prevented by the fitting relation between the column 4 and the groove 10 of the respective elements. Thus, quite a tight and positive interengagement is established between the elements of the end stop of the invention when the fastener is closed preventing any slight relative movement from occurring between the two elements in any direction, and the end stop is thus particularly suitable for use with garments subject to any vigorous body movement of the wearer such as jumpers, sports clothes and shirts.

WHAT WE CLAIM IS:—

1. An end stop for a sliding clasp fastener of the kind which incorporates a slider for connecting two sets of interconnecting elements; the end stop comprising a pair of co-operating members one for each of adjacent ends of the sets of elements, the first member affording a laterally opening slot extending in the general direction of movement of the slider, the slot being adapted laterally to receive a projection on the second member, co-operating parts on the two

members which laterally overlap after the first member is inserted into the second member and moved longitudinally relatively thereto, and a shoulder on one member arranged to be engaged laterally by one of the elements of the set to which the other member is to be connected after said longitudinal movement to prevent lateral disengagement of the members.

2. An end stop as claimed in Claim 1 in which the first and second members have engaging surfaces which are inclined to the said direction of movement.

3. An end stop as claimed in Claim 1 or Claim 2 in which the co-operating parts of the two members each comprise a hook.

4. An end stop as claimed in any one of the preceding Claims in which the shoulder comprises a recess on a further projection on the second member.

5. A sliding clasp fastener incorporating an end stop as claimed in any one of the preceding claims.

6. A sliding clasp fastener including an end stop formed by a pair of male and female interengageable elements attached to respective tapes which are to be releasably interconnected by fastening elements on the tapes; said male element including a column portion having a front face, an anchoring portion on top of said column portion formed with a curved recess to receive an engaging lug of one of the fastening elements, and a hook portion beneath the column portion formed with shoulders on opposite sides, said female element including a groove formed complementally to said column portion of said male element and a jaw portion adapted to interengage with said hook portion of said male element, said male and female elements being releasably connectable with each other through a slot formed in one side of a slider adapted to interconnect the fastening elements.

7. An end stop for a sliding clasp fastener substantially as described herein with reference to Figures 2, 3 and 4 of the accompanying drawings.

8. A sliding clasp fastener substantially as described herein with reference to the accompanying drawings.

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6. A sliding clasp fastener including an end stop formed by a pair of male and female interengageable elements attached to respective tapes which are to be releasably inter-connected by fastening elements on the tapes; said male element including a column portion having a front face, an anchoring portion on top of said column portion formed with a curved recess to receive an engaging lug of one of the fastening elements, and a hook portion beneath the column portion formed with shoulders on opposite sides, said female element including a groove formed complementally to said column portion of said male element and a jaw portion adapted to interengage with said hook portion of said male element, said male and female elements being releasably connectable with each other through a slot formed in one side of a slider adapted to interconnect the fastening elements.

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