

PATENT SPECIFICATION

(11) 1 226 973

DRAWINGS ATTACHED

- (21) Application No. 13447/68 (22) Filed 20 March 1968
 (45) Complete Specification published 31 March 1971
 (51) International Classification A 44 b 19/10, 19/26
 (52) Index at acceptance E2S 1A2A 1A2BU 1A3C



(54) SLIDING CLASP FASTENER

(71) I, TADAO YOSHIDA, a citizen of Japan and resident of No. 171, 3-chome, Tamagawa-Yoga-cho, Setagaya-ku, Tokyo, Japan, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to sliding clasp fasteners or zippers, and has particular reference to a sliding clasp fastener of the concealed type which substantially simulates a garment seam in its closed position.

Sliding clasp fasteners having two rows of interlocking elements each formed from a single plastics filament and secured to the folded edges of a pair of opposed carrier tapes are well known, and such fasteners when closed by a reciprocating slider mask the elements from external view, only leaving a linear seam in the junction of the opposed tapes.

Fasteners of this type have the slider mounted with its free edges inserted in between the folds of the tapes. This arrangement not only renders the movement of the slider rather sluggish, but also gives a tendency for the slider to rub against the folded portions of the tapes and the stitches that hold the elements thereto.

Whereas, it is an object of the present invention to provide a novel sliding clasp fastener which will eliminate the above noted difficulties.

According to this invention there is provided a sliding clasp fastener of the concealed type which comprises a pair of carrier tapes each having an inwardly folded edge portion and secured thereto a row of meandering fastener elements formed from a single plastics filament and a slider mounted on said carrier tapes for coupling and uncoupling said fastener elements, wherein each fastener element includes a coupling head and two spaced legs with one leg shorter than the other, connecting portions are provided for connecting adjacent elements, an adjacent element to one side of each one element being connected to said one element by a connecting portion connecting the long

legs and an adjacent element on the other side of said one element being connected to said one element by a connecting portion connecting the short legs and said slider has guide channels configured to embrace the connecting portions contiguous to the long legs, flank portions abutting the connecting portions of the short legs, and free edges terminating short of the tape surface without extending into the folded edge portions of the respective tapes.

For a better understanding of the invention, there are presented in the drawings preferred forms which accomplish the object of the invention. In the accompanying drawings:

Figure 1 is a transverse cross-sectional view illustrating one embodiment of the invention; and

Figures 2a and 2b are respectively a plan and a front elevational view of the chain elements employed in the construction of the concealed fastener shown in Figure 1, while Figure 2c is a partly sectional view of one of the elements of said chain.

Reference to Fig. 1 shows a pair of carrier tape stringers 10 each having an inwardly folded edge portion 11 to each of which a row of interlocking fastener elements 12 is secured by stitching 13. A chain of these elements 12 is formed from a single plastics filament, such as nylon, into a meander structure in which each element has a base portion 14 Fig. 2a deformed to provide a coupling head 15 for engagement with a corresponding part of the adjacent mating interlocking element.

The element 12 according to the invention is provided with two leg or limb portions, of which one leg 16 abutting the bottom surface of the folded tape portion is shorter in length than the other leg 17, as clearly seen from Fig. 2a. To conform cooperatively with this alternately short and long limb structure of the element chain, there is proposed a slider 18 having guide channels 19 configured in conformity with the round periphery of the connecting portion 20 of each long-leg element which lies opposite to the coupling head portion 15, and guide flanks 21 spaced apart by

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a distance determined by the total length of the two adjacent short-leg elements in their coupled disposition. It is preferred for the purposes of the invention to terminate the free edges 22 of the slider 18 normally at a point at least apart from the tape surface without having them inserted in between the folds of the respective carrier tapes, as shown in Fig. 1.

10 With this construction, the slider 18 operates to close the two opposed carrier tapes, when the connecting portions 20 of the long-leg elements 17 are guided embracingly by and in sliding contact with the walls of the guide channels 19, while the connecting portions 20 of the short-leg elements are similarly guided by the flanks 21 of the slider. In this way, contrary to conventional fastener constructions of the concealed fashion, the slider according to the invention does not forcibly contact the frictionally resistant fabric system of the tape or the stitchings holding the elements to the folded edge portions of the tapes. This facilitates the sliding motion of the slider with the added fact that the inner guide walls thereof are maintained in sliding engagement with the least frictionally resistant surfaces of the plastics elements during coupling and uncoupling operation.

30 In the embodiment shown in Fig. 1, there is provided a spacing braid 23 inserted between the short and long legs of the elements and extending longitudinally of the entire fastener. The provision of this braid serves to hold the elements from shifting out of position with respect to the stitchings when lateral load is applied to the closed tape juncture.

40 While the problem of wear has been considered of the tape and of the upper sewing threads securing the short-leg elements to the folded edge portions of the tapes, there is further provided means for preventing wear of the lower sewing threads which would otherwise occur in contact with the base wall of the slider. This wear preventing means is revealed in the embodiment, Fig. 1, as a pair of longitudinal recesses 24 formed in the base wall of the slider or the long legs may be provided with grooves.

50 In addition to the various advantages of the invention that have been advanced, it will be understood that since the free edges of the slider terminate short of the tape surface and do not extend into the folds of the tape stringers, the thickness of the slider is so much

reduced as compared with conventional counter parts, which, as a result, will facilitate ironing the garment to which the fastener is attached.

Having thus described the invention in respect of the one specific embodiment presently preferred, it is to be understood that this invention is not limited to the precise arrangements and instrumentalities shown. As for an example, the mode of stitching the elements to the tape may be a two-thread chain stitch or other stitches known in the art. Or, the elements may be secured in place simultaneously as the tape is woven.

WHAT I CLAIM IS:—

1. A sliding clasp fastener of the concealed type which comprises a pair of carrier tapes each having an inwardly folded edge portion and secured thereto a row of meandering fastener elements formed from a single plastics filament and a slider mounted on said carrier tapes for coupling and uncoupling said fastener elements, wherein each fastener element includes a coupling head and two spaced legs with one leg shorter than the other, connecting portions are provided for connecting adjacent elements, an adjacent element to one side of each one element being connected to said one element by a connecting portion connecting the long legs and an adjacent element on the other side of said one element being connected to said one element by a connecting portion connecting the short legs and said slider has guide channels configured to embrace the connecting portions contiguous to the long legs, flank portions abutting the connecting portions of the short legs, and free edges terminating short of the tape surface without extending into the folded edge portions of the respective tapes.

2. A sliding clasp fastener as claimed in Claim 1 wherein there is provided a spacing braid between the long legs and the short legs of the elements.

3. A sliding clasp fastener as claimed in Claim 1 or 2 wherein the slider is provided at its base with a pair of longitudinal recesses.

4. A sliding clasp fastener as claimed in Claim 1 or 2 wherein each element is provided at its long leg portion with grooves.

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

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30 In the embodiment shown in Fig. 1, there is provided a spacing braid 23 inserted between the short and long legs of the elements and extending longitudinally of the entire fastener. The provision of this braid serves to hold the elements from shifting out of position with respect to the stitchings when lateral load is applied to the closed tape juncture.

40 While the problem of wear has been considered of the tape and of the upper sewing threads securing the short-leg elements to the folded edge portions of the tapes, there is further provided means for preventing wear of the lower sewing threads which would otherwise occur in contact with the base wall of the slider. This wear preventing means is revealed in the embodiment, Fig. 1, as a pair of longitudinal recesses 24 formed in the base wall of the slider or the long legs may be provided with grooves.

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