

PATENT SPECIFICATION (11)

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(54) "SLIDER WITH A RELEASABLE LOCKING MECHANISM FOR CONCEALED 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:-

This invention relates generally to sliding clasp fasteners and in particular to sliding clasp fasteners of the concealed type wherein the fastener elements are completely concealed under the abutting edges of a garment or like article when the fastener is in a closed disposition thereon. Still more particularly, the invention deals with the improved configuration of a slider equipped with a releasable locking mechanism for use with the concealed sliding clasp fasteners.

The releasable locking mechanism for the slider under consideration includes a locking pawl which, when there is no pull on the pull tab of the slider, is spring-energized into interference contact with rows of interlocking fastener elements extending through the slider body, thereby locking the slider against movement in any desired position on the rows of fastener elements.

Heretofore, in the slider of the above described type, the locking pawl has been pivotally mounted on the slider body via a pivot pin extending through a bore in the locking pawl. This prior art configuration does not permit the releasable locking mechanism to be assembled on the slider body by having its constituent parts delivered thereto in the same direction, but in two crossing directions. The assemblage of the releasable locking mechanism on the slider body further involves the delicate operation of inserting the pivot pin into and through the bore in the locking pawl. It has accordingly been highly difficult to automate the assemblage of the complete slider.

The prior art configuration of the slider in question manifests another serious disadvantage when, for instance, a garment or like article to which the concealed sliding clasp fastener incorporating the slider has been attached is subjected to ironing operation. Since the locking pawl is mounted on the pivot pin as aforesaid, the pressure exerted upon the slider from above takes the form of a bending stress acting upon the pivot pin via the locking pawl. The pivot pin of slender construction is then easy to become permanently strained, thereby seriously impairing the functioning of the locking pawl mounted thereon.

According to the invention, there is provided, in a slider for a concealed sliding clasp fastener including a body having a flared front end and a contracted rear end, and a separator positioned centrally at said front end of said body to cooperate therewith to define a substantially Y-shaped guide channel therethrough, a releasable locking mechanism comprising, in combination, a pair of ears projecting upwardly from said separator and extending in the longitudinal direction of said slider substantially in spaced parallelism, a locking pawl arranged longitudinally between said ears of said separator and having a rear end projecting beyond said separator and an upwardly opening recess formed adjacent the front end thereof, a retainer pin supported by and extending transversely between said ears of said separator over said locking pawl, said retainer pin being arranged in registered relationship to said recess in said locking pawl, a spring normally biasing said locking pawl in such a manner that said recess in said locking pawl releasably engages said retainer pin and that said rear end of said locking pawl projects into said guide channel of said body, and a pull tab pivotally connected to said locking pawl and, when exerted with a pull, effective

to move said rear end of said locking pawl away from said guide channel of said body against the bias of said spring.

5 The features which are believed to be novel and characteristic of this invention are set forth in particular in the claims appended hereto. The invention itself, however, both as to its construction and mode of operation, together with the further objects and advantages thereof, will become apparent in the course of the following description, with reference to the accompanying drawings in which like reference characters denote like parts throughout the several views, and wherein;

10 Figure 1 is an exploded perspective view of a slider for a concealed sliding clasp fastener constructed in accordance with this invention, in which a pull tab is shown fragmentarily because of its common and well known nature;

15 Figure 2 is a perspective view showing the slider of Figure 1 in completely assembled form;

20 Figure 3 is a longitudinal axial sectional view of the assembled slider shown in Figure 2; and

25 Figure 4 is a view similar to Figure 3 but showing a locking pawl in its depressed position away from a retainer pin.

30 With particular reference to Figures 1 to 3, inclusive, a preferred form of the slider for a concealed sliding clasp fastener according to the invention includes a body 10 having a flared front end and a contracted rear end. More specifically, the slider body 10 comprises a bottom wall 11, a pair of side walls 12, and a pair of inwardly directed lips 13 formed along the top edges of the respective side walls. A substantially diamond-shaped separator or island 14 is formed centrally at the flared front end of the slider body 10 to cooperate therewith to define a generally Y-shaped guide channel through which the rows of interlocking fastener elements, not shown, of the concealed sliding clasp fastener are made to pass in the well known manner.

35 In accordance with this invention, the separator 14 has a pair of ears 15 projecting upwardly therefrom and extending in the longitudinal direction of the slider substantially in spaced parallelism. As illustrated in Figure 1, these separator ears have half-mooned indentations 16, respectively, that are formed in their top edges so as to be aligned in the transverse direction of the slider.

40 As best shown in Figure 3, a leaf spring 17 is arranged longitudinally between the separator ears 15, and a locking pawl 18 is also arranged longitudinally between the separator ears over the leaf spring. The locking pawl 18 has a pointed or tapered rear end 19 projecting beyond the separator 14

and a front end 20 adapted for abutting contact with the leaf spring 17 located thereunder. An upwardly opening recess 21 is formed in the locking pawl 18 adjacent the front end thereof.

45 For operatively holding the locking pawl 18 in position between the separator ears 15, a retainer pin 22 extends transversely between the separator ears over the locking pawl in vertically registered relationship to the upwardly opening recess 21 in the latter. It will be observed from a consideration of Figures 1 and 2 that the retainer pin 22 is engaged at both ends in the respective half-mooned indentations 16 in the separator ears 15, and then longitudinal compressive forces are exerted upon the separator ears to join the opposed edges of each indentation and hence to immovably support the retainer pin in position over the locking pawl 18.

50 A pull tab 23 is pivotally connected to the locking pawl 18 via a connector ring 23 somewhat loosely surrounding the locking pawl between its rear end 19 and the retainer pin 22.

55 Thus, normally, the leaf spring 17 biases the locking pawl 18 in such a manner that the retainer pin 22 is releasably engaged in the upwardly opening recess 21 in the locking pawl, as will be seen from Figure 3. Moreover, the rear end 19 of the locking pawl 18 is normally caused by the leaf spring 17 to project into the guide channel of the slider body for interference contact with the rows of fastener elements passing therethrough so that the slider is locked against movement upon the fastener elements. When a pull is exerted on the pull tab 23, however, the locking pawl 18 will pivot about the retainer pin 22 against the bias of the leaf spring 17, with the result that the rear end of the locking pawl moves out of its position of interference with the fastener elements to permit the slider to move therealong in either direction.

60 As will have been understood from the foregoing description, the assemblage of the complete slider can be completed by successively delivering the leaf spring 17, the locking pawl 18 with the pull tab 23, and the retainer pin 22 down onto the slider body 10 and then by compressing the separator ears 15. The slider is thus assemblable through an extremely simple procedure which is easy to automate.

65 When a garment or like article equipped with the concealed sliding clasp fastener incorporating the improved slider according to the invention is subjected to ironing operation, the pressure exerted upon the locking pawl 18 will cause the same to move generally downwardly away from the retainer pin 22 against the influence of the leaf spring 17, as illustrated specifically in Figure 4. This is because the retainer pin 22 is only

loosely received in the recess 21 in the locking pawl 18 when the latter is in its normal position shown in Figure 3. No pressure is thus applied to the retainer pin 22 so that there is no possibility of it being bent, damaged or otherwise deformed. It will therefore be understood that the improved slider according to the invention will remain in highly operable condition throughout the use of the concealed sliding clasp fastener over an extended length of time.

Having thus described the slider for concealed sliding clasp fasteners according to the invention, it is clear that the objects as indicated above, either explicitly or otherwise, have been attained in a simple and practical manner. While a particular embodiment of the invention has been shown and described, it is to be understood that changes may be made in the construction and arrangement of the various parts without departing from the scope of the invention as expressed in the following claims.

25 WHAT WE CLAIM IS:-

1. In a slider for a concealed sliding clasp fastener including a body having a flared front end and a contracted rear end, and a separator positioned centrally at said front end of said body to cooperate therewith to define a substantially Y-shaped guide channel therethrough, a releasable locking mechanism comprising, in combination, a pair of ears projecting upwardly from said separator and extending in the longitudinal direction of said slider substantially in

spaced parallelism, a locking pawl arranged longitudinally between said ears of said separator and having a rear end projecting beyond said separator and an upwardly opening recess formed adjacent the front end thereof, a retained pin supported by and extending transversely between said ears of said separator over said locking pawl, said retainer pin being arranged in registered relationship to said recess in said locking pawl, a spring normally biasing said locking pawl in such a manner that said recess in said locking pawl releasably engages said retainer pin and that said rear end of said locking pawl projects into said guide channel of said body, and a pull tab pivotally connected to said locking pawl and, when exerted with a pull, effective to move said rear end of said locking pawl away from said guide channel of said body against the bias of said spring.

2. The mechanism of claim 1, wherein said spring is in the form of a leaf spring arranged longitudinally between said ears of said separator under said locking pawl.

3. The mechanism substantially as herein described with reference to and as illustrated in the accompanying drawings.

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