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AUTOMATIC LOCKING SLIDER FOR SLIDE FASTENERS

This invention relates to a slider for slide fasteners, and more particularly to such a slider which is automatically lockable on the slide fastener.

Automatic lock sliders are known, a typical
5 example of which comprises a slider body including upper and lower wings, a pull tab, a locking member, a resilient member and a casing, the locking member being interposed between the pull tab and the resilient member and normally urged in a direction to lock the
10 slider in position on the slide fastener. One such known slide fastener slider disclosed in Japanese Utility Model Publication No. 55-17846 has a resilient member in the form of a leaf spring accommodated in a casing, the spring being supported on a piece of the
15 material of the casing which has been cut and bent adjacent to an opening in the casing through which a pull tab is pivotably mounted. This slider construction has a drawback in that it is not only unsightly appearance but also mechanically frail

because of the presence of such cut and bent piece in the portion of the casing which is subjected to pulling forces upon manipulation of the pull tab.

Another prior art example is shown in U.S. Patent No. 4,102,022
5 issued July 25, 1978 in which a slider has a leaf spring supported at opposite ends in recesses formed in a casing. Since it is difficult to hook both ends of the spring in such recesses, the spring being often aloof in the upper portion of the casing, there is provided a tongue-like projection on the leaf spring for engagement with a
10 locking prong to ensure locking of the slider. This structure however necessarily requires increased height of the casing to accommodate such a leaf spring and hence, so much thickness of the slider as a whole which would make the slider look unsightly and cumbersome to manipulate.

15 According to the present invention, there is provided an automatic locking slider for slide fasteners which comprises a slider body including upper and lower flanged wings joined at one end by a neck to define therebetween a substantially Y-shaped guide channel for the passage therethrough of rows of fastener elements, a locking member
20 for locking the slider against movement, a pull tab operatively associated with said locking member, a casing mounted on said slider body to cover said locking member, and a spring member interposed between said casing and said locking member and normally urging said locking member toward said guide channel, characterized in that said
25 casing interiorly has first and second retaining lugs at opposite ends and said spring member has opposite ends loosely retained on said first and second retaining lugs, respectively and said spring member being resiliently

flexible relative to said locking member.

It is believed possible by means of the present invention to provide an automatic lock slider for slide fasteners which will eliminate the foregoing drawbacks of the prior art and which has a casing
5 accommodating a leaf spring securely in operative position, the casing being mechanically strong and relatively low in profile.

The invention will be described by way of examples with reference to the accompanying drawings, in which like references refer to like parts unless stated otherwise, and in which:-

10 Figure 1 is a perspective view of a slider embodying the invention;

Figure 2 is a bottom plan view of a casing which constitutes part of the slider of Figure 1;

Figure 3 is a longitudinal cross-sectional view taken along lines III-III of Figure 2;

15 Figure 4 is a view similar to Figure 2 but showing a leaf spring mounted in the casing;

Figure 5 is a longitudinal cross-sectional view taken along lines V-V of Figure 4;

20 Figure 6 is a transverse cross-sectional view taken along lines VI-VI of Figure 2;

Figure 7 is a plan view of a series of leaf springs formed successively from a blank sheet

material;

Figure 8 is an exploded perspective view showing various structural components of the slider of Figure 1;

5 Figure 9 is a longitudinal cross-sectional view on enlarged scale of the slider of Figure 1; and

Figure 10 is a longitudinal cross-sectional view of a modified slider according the present invention.

As shown in Figure 1, a slide fastener slider 10
10 of an automatically lockable type includes a pair of pull tabs 11, 11' for moving the slider 10 along a pair of rows of coupling elements E (shown by phantom lines in Figure 9) on the companion fastener stringers F, F to open and close the fastener in a
15 manner well known in the art. The slider 10 comprises a slider body 12 including a pair of flanged wings 13, 14 superposed one on the other and joined at their one ends by a neck 15 so as to define therebetween a substantially Y-shaped guide channel 16 for the passage
20 therethrough of the coupling element rows E on the slide fastener stringers F.

As better shown in Figures 8 and 9, the upper and lower wings 13 and 14 are provided symmetrically at one end adjoining the neck 15 with outwardly projecting support posts 17 and 18, respectively, which are substantially structurally identical in that they each have a bearing recess 19 for receiving a support pin .

20, 20', later described, and a common through opening 21 extending vertically through the neck 15.

Adjacent to the other end of the slider body 12 opposite to the support posts 17, 18, there are support lugs 22, 23 symmetrically disposed at and projecting outwardly from the upper and lower wings 13 and 14, respectively, the upper support lug 22 having an aperture 24 communicating with the guide channel 16.

A first locking member 25 is associated with the upper wing 13 of the slider body 12 and has, at one of its opposite ends, a bore 26 for receiving the support pin 20, and a downwardly extending link arm 27 received within the common opening 21. The other end of the locking member 25 has a downwardly projecting locking prong 28 movable into and out of the passageway of the coupling element rows E in the guide channel 16.

A second locking member 29 is associated with the lower wing 14 of the slider body 12 and has at its one end an upwardly extending link arm 30 engageable with the downwardly extending arm 27 of the first locking member 25, the other end of the locking member 29 having a locking prong 31 directed toward the locking prong 28 of the first locking member 25 and releasably engageable with the lower wing 14. The locking member 29 further has a bore 32 (Figure 8) adjacent to the link arm 30 for receiving the pin 20'.

The first and second locking members 25 and 29

are mounted on the respective wings 13 and 14 through the pins 20, 20' about which they are pivotable so as to move the respective locking prongs 28 and 31 toward and away from each other. The two link arms 27 and 30
5 have abutments 33 and 34, respectively, which are engageable to transmit torque between the two locking members 25 and 29 applied upon manipulation of the pull tabs 11, 11' as hereafter described.

A leaf spring 35 is formed successively from a
10 sheet material, as shown in Figure 7, into a structure having a protuberance 35a at one end and a recess 35b at the opposite end. The spring 35 is accommodated flexibly within an upper casing 36 and normally urges the first locking member 25 downwardly or in a
15 direction to lock the slider 10 as shown in Figure 9.

Figures 2 - 6, inclusive, show the interior detail of the upper casing 36 in which there are provided a first retaining lug 36c depending from an arcuate upper inner wall of the casing 36 adjacent to
20 the front end thereof and a second retaining lug 36d also depending from the upper inner wall of the casing 36 adjacent to the rear end thereof. The first retaining lug 36c is engaged with the protuberance 35a of the leaf spring 35, and the second retaining lug 36d is engaged in the recess 35b defined by bifurcations 35c of the leaf spring 35. More specifically, as shown in Figures 4 and 5, the first lug 36c in the form of a

rectangular flap is folded over the protuberance 35a, and the second lug 36d is received in the recess 35b with its forked ends 36d' spread apart and folded over the corresponding bifurcations 35c of the leaf spring 35 as shown in Figure 6 whereby the leaf spring 35 is retained loosely in position within the upper casing 36 stably but loosely to permit its resilient, movement relative to the locking member 25.

The pair of pull tabs 11, 11' have their respective trunnions 11a, 11'a disposed between the upper wing 13 and the first locking member 25 and between the lower wing 14 and the second locking member 29, respectively, and extending transversely across the slider body 12 between the oppositely disposed support posts 17, 18 and between the support lugs 22, 23, respectively, as shown in Figures 2-4.

The upper casing 36 and an identical lower casing 37 each have a transverse opening 36a, 37a through which the trunnions 11a, 11'a of the pull tabs 11, 11' are passed to permit pivotal movement of the latter as illustrated in Figures 3 and 4.

A pin retainer 36b, 37b (Figures 3 and 8) is provided at the inner wall of each of the casings 36, 37 for retaining the pin 20, 20' in position.

As shown in Figure 1, the upper and lower casings 36 and 37 are mounted over the upper and lower wings 13 and 14, respectively and are secured in place

by crimping the material of their corners 38 into side recesses 39 (Figure 8) of the posts 17, 18 and the lugs 22, 23.

As shown in Figure 9, both pull tabs 11 and 11' are laid rearwardly of the slider body 12 flat against the surfaces of the upper and lower wings 13 and 14, respectively, in which condition the first locking member 25 is urged by the spring 35 to let its prong 28 move toward and rest between the fastener elements E thereby locking the slider 10 against movement relative to the fastener.

The upper pull tab 11 may be lifted to pull the slider 10 in one direction to open, or in the other direction to close the fastener as is well known. When thus lifting or rotating the pull tab 11 clockwise, the upper locking member 25 rotates about the pin 20 with its prong 28 retracted away from the passageway or guide channel 16 against tension of the spring 35, in which instance the upper locking member 25 and the lower locking member 29 are disengaged at their respective abutments 33 and 34.

The lower pull tab 11' may also conveniently be used to operate the slider 10 from underside.

Figure 10 illustrates a single pull tab slider 40 incorporating the casing-and-leaf-spring features of the invention. The structural details of the slider 40 is obvious from the foregoing embodiment and no

description is necessary.

Since the leaf spring 35 is provided as a set with the casing 36, the work of assembling of the parts as shown in Figure 8 can be so much streamlined.

5 Reference is directed to our co-pending patent application No. 86 12618 (Serial No. 2 180 592) entitled "Automatic locking slider with a pair of pull tabs" - reference 23QP52366.

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CLAIMS

1. An automatic locking slider for slide fasteners which comprises a slider body including upper and lower flanged wings joined at one end by a neck to
5 define therebetween a substantially Y-shaped guide channel for the passage therethrough of rows of fastener elements, a locking member for locking the slider against movement, a pull tab operatively associated with said locking member, a casing mounted
10 on said slider body to cover said locking member, and a spring member interposed between said casing and said locking member and normally urging said locking member toward said guide channel, said casing interiorly having first and second retaining lugs at opposite ends
15 and said spring member having opposite ends loosely retained on said first and second retaining lugs, respectively and said spring member being resiliently flexible relative to said locking member.

2. An automatic locking slider according to
20 claim 1, said casing having an arcuate inner wall facing to said slider body, said first and second retaining lugs projecting from said inner wall and having bent ends respectively supporting thereon said opposite ends of said spring member.

25 3. An automatic locking slider according to claim 2, said spring member having at one of its opposite ends a protuberance and at the other end a



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pair of bifurcations, said bent end portion of said
first retaining lug being directed toward said second
retaining lug, said bent end portion of said second
retaining lug comprising a pair of forked ends spread
5 laterally away from one another and respectively
engageable with said bifurcations of said spring
member.

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