SLIDER FOR FASTENERS

Filed Feb. 11, 1935
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Application February 11, 1895, Serial No. 5,970

7 Claims. (Cl. 24—205)

This invention pertains to sliders for slide actuated fasteners, and relates more particularly to improved holding or locking means operative to retain the slider in adjusted position. Locking or retaining means for sliders of this general type are well known, one desirable arrangement being disclosed in the patent to Prentice No. 1,880,749. However, many prior devices require that the operator exert some positive effort in order to make the locking device effective, for example, that he forcibly press the pull tab rearwardly so that the retaining tooth, cam, spring finger, or the like, may enter between the fastener elements or be pressed firmly against the latter so as to obtain the desired holding or locking action.

Moreover, many of the prior devices are of complex and expensive construction, and for this reason impractical for use in devices which must be sold at a very low price, while some of the prior devices interfere, to some degree, with the movement of the pull tab, or fail properly to release the slider for free movement when the pull tab is grasped for actuating the slider.

One object of the present invention is to provide a locking slider in which locking or retaining element is brought into action automatically, preferably by gravity, as soon as the pull tab is released. Thus the operator is not required to press the pull tab rearwardly or to perform any action other than that of allowing the pull tab to drop freely in order to lock the slider in adjusted position.

A further object of the present invention is to provide a locking element which is substantially concealed and protected so that it can not scratch, catch in, or otherwise damage the user’s garments or person. Further objects are to provide a locking element which is positively removed from locking position whenever the pull tab is manipulated to move the slider, whether in an upward or downward direction; to provide a locking element so associated with a movable support for the pull tab, and device to which the latter is pivotally connected, that the full weight of the tab is available to move the locking element into operative position when the tab is released after actuation of the slider; to provide a locking unit of simple construction comprising the movable support and the pull tab suspended therefrom, together with housing means for holding such locking unit in assembled relation to the slider body.

Other objects and advantages of the invention will be made manifest hereinafter in the more detailed description and by reference to the accompanying drawing, in which:

Fig. 1 is a fragmentary front elevation, to large scale, of a fastener device comprising a slider embodying the present invention;

Fig. 2 is a front elevation of the slider, removed from the other parts of the fastener and with the pull tab removed;

Fig. 3 is a vertical section substantially on the line 3—3 of Fig. 4, with the locking device in operative position;

Fig. 4 is a section similar to that of Fig. 3, but showing the parts in the positions which they occupy when the tab is grasped for moving the slider downwardly;

Fig. 5 is a view similar to Fig. 4, but showing the parts in the positions which they occupy when the pull tab is grasped for moving the slider upwardly;

Fig. 6 is a side elevation, to large scale, of the movable support and locking element removed from the slider;

Fig. 7 is a front elevation of the device shown in Fig. 6; and

Fig. 8 is a front elevation of the pull tab removed from the slider.

Referring to the drawing, the numerals 1 and 2, respectively, designate flexible supports or stringers of the type usually employed for supporting the opposed series 3 and 4, respectively, of fastener elements. These fastener elements may, for example, be of the type disclosed in the patent to Prentice No. 1,880,749, dated February 7, 1928, although the type of fastener element employed is immaterial to the present invention.

The fastener here illustrated is provided with a separable bottom stop comprising the socket member 5 secured to the slider 1 and the pin member 6 secured to the stringer 2. The stringers are also furnished with fixed top stops 7 and 8 of any suitable construction. The slider 8, so far as its general construction is shown, may be of any of the well known types, although as here illustrated it is of the kind disclosed in the patent to Legat No. 1,969,270, dated August 7, 1934, and operative to close the fastener either by upward or downward movement.

This slider comprises the front wing 11 and the rear wing 12, rigidly united by the neck portion 13. In the present instance, in accordance with this invention, the front wing 11 is furnished with an aperture 14 at a point intermediate the neck portion and the lower end of the slider, this aperture as here illustrated being of substantially rectangular contour, although the exact shape of the aperture is not material. The walls of this aperture form part of the housing for a pull tab...
support 15. As illustrated by way of example in Figs. 6 and 7, the pull tab support is made from sheet material of substantially the same thickness as the front wing 11 of the slider body, and comprises a body portion which is of such shape and contour (herein illustrated as rectangular) as to be loosely within the aperture 14. This pull tab support is provided with a locking tooth 16 adjacent to the lower end of its body portion, such tooth being of such dimensions that it may enter between adjacent fastener elements of one of the series. When thus entered, the tooth acts to prevent movement of the slider longitudinally of the fastener. Obviously the tooth or equivalent locking element may be disposed to engage with fastener elements of either series as preferred, or, if desired, teeth may be disposed near opposite edges of the member 15 so as to engage between elements of both series. In the latter case the teeth should obviously be at different heights. The tab support 15 is furnished at its forward or outer side with a combined bearing and rocker member 17 projecting forwardly and outwardly from its body portion and conveniently formed by striking up the material of the body portion at the center of the latter. This bearing and rocker member is preferably so shaped as to provide a substantially semicircular bearing 16 and a curved rocker surface 19 substantially concentric with the curved wall of the bearing opening.

The pull tab 10 is bifurcated at its upper part to provide the spaced arms 20 and 21 having the inwardly and oppositely directed pintle members 22 and 23. These pintle members are of substantially circular cross section, and by springing the arms 20 and 21 apart, these pintle members may be entered from opposite directions into the bearing opening 18 of the member 15. This member 15, when assembled with the slider body, thus forms a support for the pull tab, from which the latter normally depends freely and to which the pull tab is permanently united, and the bearing opening 18 together with the pintle members 22 and 23 provide a pivotal connection between the support and the pull tab.

The support 15 is retained in assembled relation with the slider body by means of a housing member 24 which may conveniently be made from sheet metal of proper thickness and which comprises an upper relatively narrow portion 24a which is fixed within the neck portion of the slider, for example, as shown in Fig. 2, by swedging over portions 24b of the slider body. The lower end of the member 24 is furnished with a finger 25 which fits in an opening in a socket member 26 preferably struck out from the metal of the front wing 11. The member 24, as thus arranged, bridges the aperture 14 in the front wing, and opposite this window is provided with a recess 27 having a curved inner wall 28 which loosely embraces the rocker or bearing member 17 of the locking device, the lower part of this curved wall sloping downwardly and rearwardly. This wall 28 of the recess 27 is provided, adjacent to its upper extremity, with a projecting fulcrum member 29.

In assembling the parts, the pull tab is first united to the supporting member 15 so that its pintle elements 22 and 23 are disposed in the bearing opening 18. The body portion of the tab support is then disposed in the aperture 14 of the front wing, and the lower part of the housing member 24 is passed through the central aperture 10 of the pull tab and its finger 25 fitted into the socket 26. The member 24a of the housing device is then disposed at the central part of the neck of the slider body and the parts 24b swedged over it so as to fix it in position.

When the pull tab is permitted to depend in response to the action of gravity, as shown in Fig. 3, the pintle members 22 and 23, resting in the bearing opening 18, pull the support downwardly, and as the rocker tends to slide rearwardly along the sloping lower portion of the aperture, the tab support takes up a position in the vertical plane of the aperture 14. In this position the locking tooth 16 enters between adjacent fastener elements of one series or the other, in accordance with the side of the member 15 at which the tooth is located, thus holding the slider in an adjusted position. Such disposal of the locking member requires no effort whatsoever on the part of the operator. However, when the pull tab is raised, as shown in Fig. 5, to move the slider upwardly, the pintle members 22 and 23 exert an upward and outward pressure against the inner surface of the rocker member 17 so that the latter fulcrums at its upper end at 29 and the tooth 16 is swung outwardly and away from the fastener units, thus positively freeing the slider for movement. In the same way, if the pull tab is disposed as shown in Fig. 4 for moving the slider downwardly, the locking element fulcrums about the point 29, thus again positively freeing the tooth 16 from the fastener units; but upon release of the pull tab (from either of the positions shown in Figs. 5 and 4, respectively) it is free to drop by the action of gravity to the position of Fig. 3 where the locking action of the tooth 16 becomes effective.

Not only does the tab support 15 form a convenient actuator for the locking element, but it also provides, in combination with the housing member 24, a ready means for pivotally uniting the pull tab to the slider body so as to give the pull tab unusual freedom to swing without danger of binding, it being noted that the pull tab may be assembled with the part 15 of the slider body which is then very easily associated with the slider body by the application of the part 24, the latter being of substantial size so that it may be manipulated easily. Thus less skill is required in assembling the parts than is sometimes the case when the pull tab is pivoted to the slider body as in some previous methods of procedure.

While herein I have made reference to the "upper" and "lower" parts of the slider body and have used such expressions as "vertical", "front" and "rear" as a convenient mode of designating the relative locations of the parts, it is to be understood that these terms have been used with reference to the position of the parts as disclosed in the accompanying drawing and are not to be considered as limiting expressions. Furthermore, it is to be understood that any suitable materials may be employed in making my improved slider and its parts and that any substitutions of materials or variations in the shapes and relative arrangement of parts such as fall within the scope of the appended claims are to be regarded as forming a part of the invention. I claim:

1. A locking slider for slide actuated fasteners of the kind in which opposed series of fastener elements are carried respectively by flexible supports, said slider having a body comprising front and rear wings united by a neck, the front wing having an aperture therethrough, a pull tab sup
port comprising a body portion which fits loosely within said aperture so as to rock freely therein, a bearing portion which projects forwardly of the plane of the outer face of the front wing, and a locking tooth which projects rearwardly from the body portion, a rigid housing member carried by the slider body and which bridges said aperture and which also bridges the bearing portion of the tab support, said housing member having a fulcrum element disposed forwardly of the plane of the outer face of the front wing, and so constructed and arranged that when the pull tab is swung outwardly, for moving the slider, the tab support rocks about said fulcrum element to carry the tooth out of locking position.

2. A locking slider for slide actuated fasteners of the kind in which opposed series of fastener elements are carried respectively by flexible supports, said slider having a body comprising front and rear wings united by a neck, the front wing having an aperture therethrough, a pull tab support comprising a body portion disposed in said aperture, and a forwardly directed rocker portion, a pull tab pivotally united to said rocker portion, a housing member carried by the slider body and bridging said aperture, said housing member having a recess provided with a curved inner wall forming a guide for the rocker member, and a locking tooth projecting inwardly from the tab support toward the fastener elements.

3. A locking slider for slide actuated fasteners of the kind in which opposed series of fastener elements are carried respectively by flexible supports, said slider having a body comprising front and rear wings united by a neck, the front wing having an aperture therethrough, a pull tab support comprising a body portion disposed in said aperture, said body portion having a locking tooth adjacent to its lower end projecting rearwardly toward the fastener elements, the pull tab support also having a forwardly directed member provided with a substantially semieliptical bearing opening and a curved outer surface substantially concentric with said opening, a pull tab having a pinlet member disposed in said bearing opening, and a housing member fixedly secured to the slider body and bridging the aperture, said housing member having a recess whose inner surface is curved and forms a guide for the curved outer surface of the forward projection of the locking member, said recess having a fulcrum element engageable by the upper part of the body portion of the locking member when the tab is swung outwardly for moving the slider.

4. A slider for slide actuated fasteners, said slider having a body provided with an aperture for the passage of a locking element, housing means carried by the slider body, a movable member within said housing means, a locking element carried by said movable member, a pull tab, means pivotally uniting the pull tab to said movable member, the pull tab normally depending from said movable member, said housing means having a rearwardly and downwardly inclined surface for engagement by said movable member and being so constructed and arranged that when the pull tab depends freely from said movable member the latter tends to slide rearwardly relatively to the body portion of the slider in response to the weight of the tab thereby moving the locking element into operative position.

5. In combination a pull tab and a pull tab support, said support having a body portion and a forwardly projecting bearing portion, pivot means uniting the tab to the bearing portion of the tab support, said bearing portion having a curved forward edge, and a slider comprising housing means within which the body portion of the tab support is loosely confined, said housing means having a rearwardly and downwardly sloping guide surface for contact with the curved forward edge of the bearing portion of the tab support.

6. In combination a pull tab and a pull tab support, said support having a body portion and a forwardly projecting bearing portion, pivot means uniting the tab to the bearing portion of the support and a slider comprising housing means within which the tab support is loosely confined, said housing means comprising a rearwardly and downwardly sloping guide surface along which the bearing portion of the tab support tends to slide in response to the weight of the depending tab.

7. A slider including a wing member and a locking unit comprising an assembled pull tab and pull tab support, the latter having a body portion provided with a rearwardly directed locking tooth and a forwardly projecting bearing portion, pivot means permanently uniting the tab to the bearing portion of the tab support, and housing means holding the locking unit in assembled relation with the slider wing, said housing means having a rearwardly and downwardly inclined guide surface, the parts being so designed and arranged that the weight of the depending tab, reacting against the tab support, tends to move the latter downwardly and rearwardly.

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