Nov. 21, 1933. S. H. NORTON 1,936,096

LOCK SLIDER FOR SEPARABLE FASTENERS

Original Filed April 16, 1929

Fig. 1.

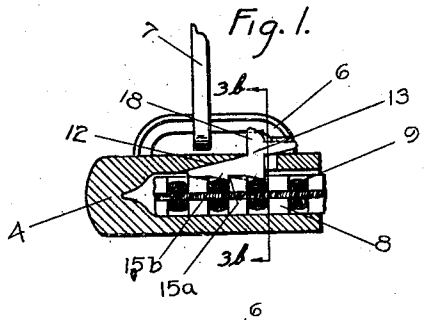


Fig. 2.

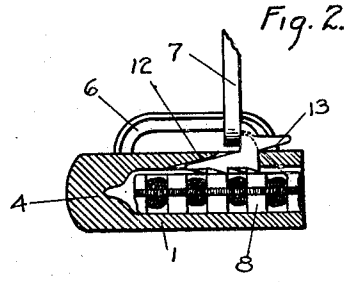


Fig. 3.

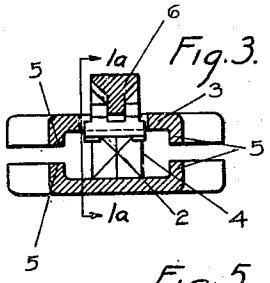


Fig. 4.

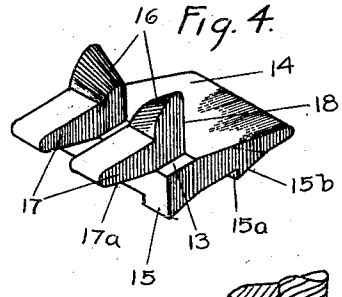
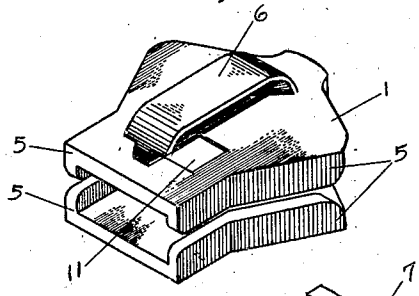


Fig. 5.



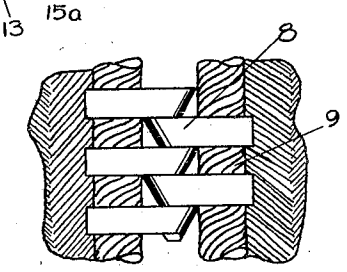
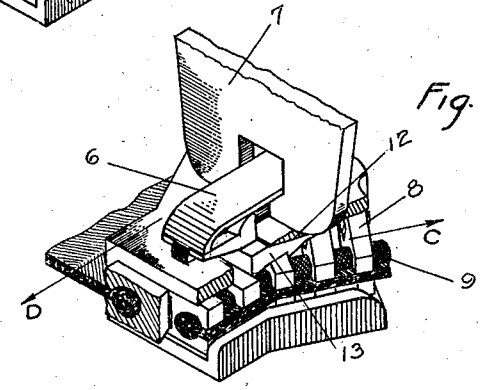


Fig. 7.

Fig. 6.



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UNITED STATES PATENT OFFICE

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LOCK SLIDER FOR SEPARABLE FASTENERS

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Application April 16, 1929, Serial No. 355,581
Renewed July 10, 1933

14 Claims. (Cl. 24—205)

The present invention relates to sliders for separable fasteners and has for its object to provide a simple and efficient device in connection with the slider which will prevent opening of the fastener by pulling on the flaps to which the fastener is applied.

The opening of the fastener by pulling on the edges to which the fastener elements are attached is known as "tear opening" and is objectionable in many cases, particularly where the fastener is applied to garments, for the reason that there is a tendency for the fastener to gradually work open.

The present invention provides a locking element in connection with the slider which prevents movement of the slider on the fastener elements except by direct pull on the slider,

A further object is to provide a lock which is automatically released when the slider is pulled by means of its attached pull member in either direction, but which positively prevents the fastener elements from being pulled through the slider.

A further object is to provide a locking device of the character above described which operates efficiently when applied to a fastener which is closed by downward movement of the slider.

With the above and other objects in view, the invention may be said to comprise the device as illustrated in the accompanying drawing hereinafter described and particularly set forth in the appended claims, together with such variations and modifications thereof as will be apparent to one skilled in the art to which the invention appertains.

Reference should be had to the accompanying drawing forming a part of this specification in which:

Figure 1 is a longitudinal section through the slider showing the locking member in locking position, the section being taken on the line indicated at 1*a*—1*a*, in Fig. 3.

Figure 2 is a sectional view similar to Fig. 1 showing the locking member in releasing position.

Fig. 3 is a transverse section through the slider taken on the line indicated at 3*b*—3*b*, Fig. 1.

Fig. 4 is an enlarged isometric view of the locking element.

Fig. 5 is an enlarged isometric view of the body of the slider.

Fig. 6 is a fragmentary isometric view showing the slider applied to a separable fastener.

Fig. 7 is a fragmentary plan view of the interlocking fastener elements.

As herein illustrated, the invention is applied to a coined slider such as commonly used on separable fasteners. The slider, which is indicated by the reference numeral 1, is composed of inner and outer parallel wings 2 and 3 which are widened at one end and rigidly connected at the center of the widened end by an integral separating web 4. The side edges of the wings are provided with short opposed guide flanges 5 and these flanges are spaced apart sufficiently to accommodate the fabric of the flexible flaps which are connected by the fastener. The outer wing 3 has formed integrally therewith a longitudinally extending flanged lug 6 to which a pull member 7 is slidably connected. The slider serves to progressively interlock or release the fastener stringers having rows of fastener elements or scoops 8 which are attached at closely spaced points along cords 9 which are secured to the edges of the fabric or other flexible material of the flaps connected by the fastener.

In the operation of the slider, the fastener elements 8 are guided into the spaces between the web 4 and flanges 5 at the wide end of the slider as the slider is moved toward the portions of the flanges separated by the web 4 and are brought together and guided into interlocking engagement as they pass through the narrow portion of the slider toward the open end. Movement of the slider in the opposite direction causes the flexible material to which the interlocked fastener elements are attached to be bent laterally, separating the interlocking portions of the fastener elements and permitting the fastener elements of each of the two flaps to pass through the openings of the slider on opposite sides of the separating web.

As so far described, the slider is of a well known type, the present invention comprising a locking device which is adapted to be applied to a slider of standard form without materially altering the structure of the slider. To accommodate the locking element, the outer wing 3 is provided with a longitudinal central recess or slot 11 beneath the attaching lug 6, the slot 11 being adjacent the open end of the slider. Between the slot 11 and the separating web 4, the interior of the outer wing 3 has a bearing face 12 which tapers to the edge of the slot 11. A one piece locking element 13 is mounted in the slot 11 and has an inner wedge shaped projection 14 within the slider which projects between the wings toward the separating web 4 and which has an inclined outer face which bears against the inclined face 12 of the slider.

The bottom face of the locking member 13 is provided with spaced locking projections or ratchet lugs 15 adjacent opposite side edges thereof which are adapted to engage with the spaced fastener elements 8 on opposite sides of the interlocking portions thereof. The lugs 15 have right angle shoulders 15*a* on the side toward the open end of the slider and inclined faces 15*b* on the side toward the separating web 4, thus providing inwardly opening notches for receiving the fastener elements in locking engagement. The lock member also has an outwardly projecting portion 16 which extends through the slot 11 and this outwardly projecting portion 16 is provided with a wedge shaped projection 17 which extends toward the narrow end of the slider and which has an inner tapered engaging face 17*a* which engages with the outer surface of the slider at the end of the slot 11 toward the narrow end of the slider. The projecting portion 16 also has a shoulder 18 on the side toward the separating web which is in the path of the pull member 7. It will be noted that the locking member rests loosely in the recess and is held in position by its walls in such a way as to permit limited shifting movement longitudinally.

The fastener will be opened by pulling the pull member in a direction in which it engages with the shoulder 18. The pull is therefore applied to the shoulder 18 of the locking member 13 causing the locking member to be moved in the slot in a direction away from the separating web 4 and the inclined face 17*a* of the wedge shaped projection 17 to ride on the outer face of the slider and move the lock member outwardly. The pressure of the pull member against the shoulder 18 tends to rock the locking member about the line of engagement of the inclined face 17*a* with the slider as a fulcrum pressing the projection 14 against the inclined face 12 of the slider so that the elongated engaging face of the locking member is moved bodily outward to free the same from the locking elements of the fastener and permit movement of the slider along the flaps.

When the slider is pulled by the pull member in the opposite direction, the frictional engagement of the fastener elements with the inclined faces 15*b* of the locking lugs will cause the locking member to be forced toward the rear end of the slot 11 and outwardly away from the fastener elements to permit the fastener elements to pass through the slider.

If the slider is used on a fastener which is closed by downward movement of the slider, the locking member 13 is so positioned in the slider that it will tend to move by gravity to the locking position shown in Fig. 1. If the separated fastener elements beyond the separating web 4 should be pulled in a direction to slide the fasteners through the slider toward the separating web 4, and thereby cause separation of the fasteners, movement of the fasteners will be prevented by the engagement of the shoulders 15*a* with the fastener elements 8 so that the tear opening of the fastener is positively prevented.

When the locking device of the present invention is used on fasteners which are closed by upward movement, the lock member tends to move by gravity away from the tapered face 12, but the inclined face 17*a* engaging the edge of the slot 11 rocks the point of the wedge shaped projection 14 inwardly, keeping the same in engagement with the fastener elements and maintaining the forward locking lugs 15 in fastener engaging position so that a pull on the flaps tending to slide the fastener elements toward the web 4 will draw the locking member 13 into wedging engagement with the inclined face 12 so that tear opening of the fastener is prevented.

It will be apparent that the present invention provides a very simple locking element which is easily applied to a standard slider and which requires but little alteration of the structure of the slider so that there is very little addition to the cost of manufacture due to the provision of the safety lock.

Furthermore, it is to be understood that the particular form of apparatus shown and described, and the particular procedure set forth, are presented for purposes of explanation and illustration and that various modifications of said apparatus and procedure can be made without departing from my invention as defined in the appended claims.

What I claim is:

1. In a separable fastener, a slider having a pull member slidably connected thereto for movement longitudinally thereof, and a locking member mounted for longitudinal movement in the slider and having locking portions engageable with the fastener elements and tapered face portions engageable with the slider to move the locking member toward and from the fastener elements, said locking member having a shoulder in the path of movement of the pull member whereby the slider is released upon movement of the pull member in one direction.

2. In a separable fastener, a slider having a pull member slidably connected thereto for movement longitudinally thereof, and a locking member mounted for longitudinal movement in the slider having oppositely disposed projections, which have inclined faces engaging interior and exterior surfaces of the slider, said locking member having a portion in the path of movement of the pull member so as to be controlled thereby.

3. In a separable fastener, a slider having a pull member slidably connected thereto for movement longitudinally thereof, said slider having a longitudinal slot in its outer wall and an interior inclined face tapering toward an end of said slot, a locking member having a wedge shaped portion engaging said inclined face and having locking lugs engageable with the fastener, said locking member having a portion projecting through the slot and lying in the path of movement of the pull member so as to be controlled thereby.

4. In a separable fastener, a slider having a pull member slidably connected thereto for movement longitudinally thereof, said slider having a separating web at one end and being open at its opposite end, said slider having a longitudinal slot in the outer side thereof and an inclined interior face between the slot and web tapering to the end of said opening, and a locking member slidable in said slot and having a wedge shaped projection within the slider extending toward the web and engaging said inclined face, said locking member having ratchet lugs on its inner face which have square shoulders on the sides thereof toward the open end of the slider, said locking member having a projection in the path of the pull member between the pull member and open end of the slider whereby said locking member may be actuated by said pull member.

5. In a separable fastener, a slider having a pull member slidably connected thereto for movement longitudinally thereof, said slider having a separating web at one end and being open

at its opposite end, said slider having a longitudinal slot in the outer side thereof and an inclined interior face between the slot and web tapering to the end of said opening, and a locking member slidable in said slot and having a wedge shaped projection within the slider extending toward the web and engaging said inclined face, said locking member having ratchet lugs on its inner face which have square shoulders on the sides thereof toward the open end of the slider, said locking member having a projection in the path of the pull member between the pull member and open end of the slider whereby said locking member may be actuated by said pull member, and a projection outside the slider extending toward the open end of the slider which has an inclined inner face engaging the slider.

6. A separable fastener slider comprising spaced wings one of which has a recess therein, a locking member held loosely in position by the walls of said recess but shiftable longitudinally therein into and out of locking engagement, said locking member having a projection thereon adapted to enter between interlocking members of a fastener stringer to lock the slider, and means for actuating said locking member.

7. A separable fastener slider comprising spaced wings, an opening in one wing, a locking member resting loosely in said opening, said member having a plurality of projections thereon for engaging between interlocking members of fastener stringers to lock the slider, and controlling means for said locking member.

8. In a separable fastener having cooperating rows of fastener elements formed for interlocking engagement, a slider for progressively locking and releasing the fastener elements, said slider having a recess therein, and a locking member resting loosely in said recess, said member having a projection thereon of smaller dimension lengthwise of the fastener than the spacing between adjacent elements, and positioned to register with said space whereby it may enter between said fastener elements to lock the slider, and a slider actuating member arranged also to control said locking member.

9. In a separable fastener, cooperating rows of fastener elements formed for interlocking engagement, a slider comprising spaced wings for progressively locking and releasing the fastener elements, a locking member carried by the slider, said locking member having a wedging portion extending between said wings and adapted to be wedged between said fastener elements and one wing of the slider to lock the slider against unintended movement, and a slider pull member separate from said locking member engageable with said locking member to release the same from locking engagement.

10. A separable fastener slider comprising spaced wings, a locking member carried loosely by one of said wings and mounted for longitudinally shiftable movement relative to the slider, whereby when said locking member is shifted in one direction, said slider is locked in position on the fastener stringers and when shifted in the opposite direction, said slider is free to move on said stringers and a separate pull member carried by said slider adapted to control said locking member.

11. In a separable fastener having cooperating rows of fastener elements formed for interlocking engagement, a slider for progressively locking and releasing the fastener elements, said slider having an opening formed therein, a locking member in said opening and shiftable longitudinally of the slider, and a pull member mounted on the slider and having a portion engageable with said locking member to release the same.

12. In a separable fastener having cooperating rows of fastener elements formed for interlocking engagement, a slider for progressively locking and releasing the fastener elements, said slider having spaced wings one of which has an opening therein, a pull member mounted on the slider, a locking member resting loosely in said opening and automatically operable to lock the slider regardless of the position of said pull member, and means on said pull member adapted to engage said locking member for moving said locking member to unlocking position.

13. In a separable fastener having rows of cooperating fastener elements formed for interlocking engagement, a slider for progressively locking and releasing the fastener elements, and means carried by said slider presenting inwardly opening notches adapted in one position to receive at least one of said fastener elements for locking the slider.

14. In a separable fastener having cooperating rows of fastener elements formed for interlocking engagement, a slider mounted on said elements for progressively locking and relasing the same, said slider comprising parallel wings one of which has an opening therein, a pull member connected to the slider adjacent said opening, and a slider locking member loosely mounted in said opening and having a portion narrower than the space between adjacent fastener elements, said locking member positioned so that said portion will enter between the fastener elements to lock the slider, and said locking member being controllable by said pull member.

SAMUEL H. NORTON.

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CERTIFICATE OF CORRECTION.

Patent No. 1,936,096. November 21, 1933.

SAMUEL H. NORTON.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 1, line 81, for "flanges" read flaps; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 12th day of December, A. D. 1933.

F. M. Hopkins

(Seal) Acting Commissioner of Patents.