

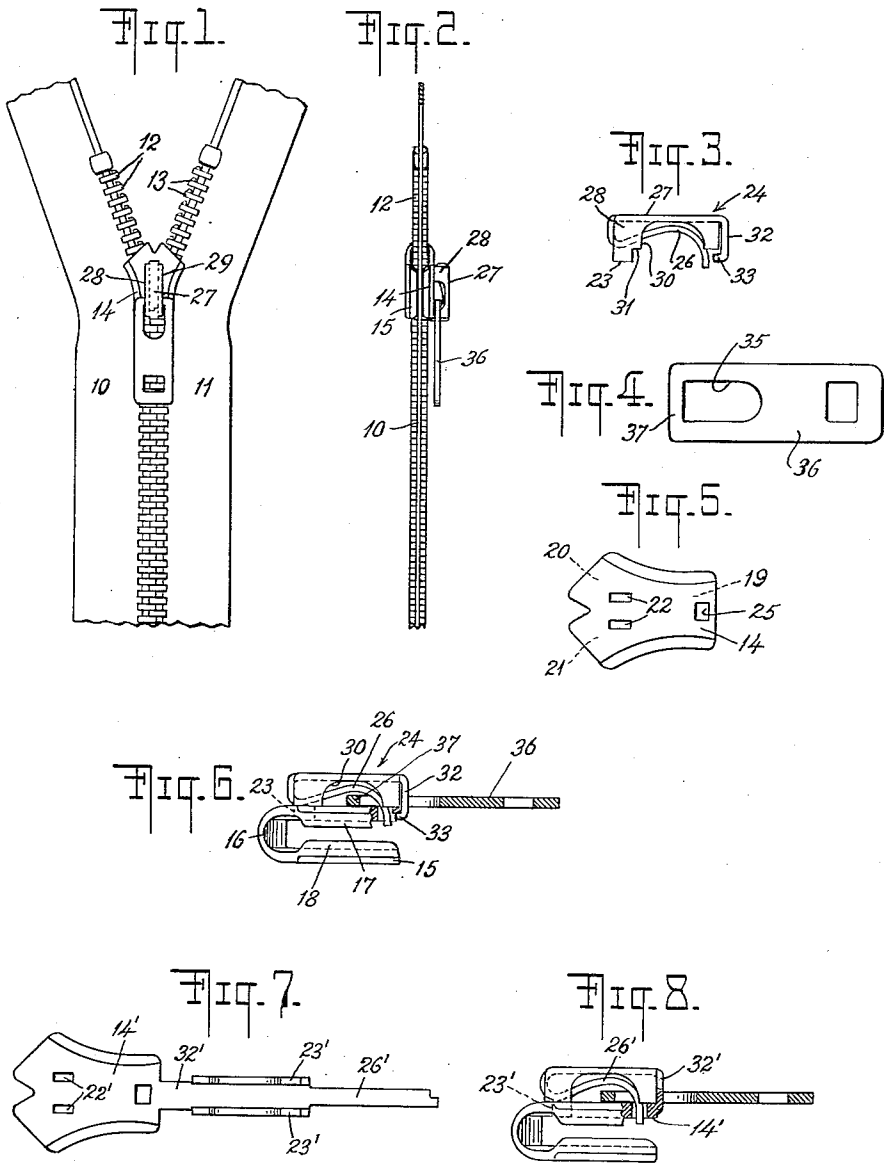
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AUTOMATIC LOCK SLIDER FOR FASTENERS

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## AUTOMATIC LOCK SLIDER FOR FASTENERS

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1 Claim. (Cl. 24—205.14)

This invention relates to separable fasteners of the slide operated type and more particularly to a slider therefor provided with locking means for preventing unintentional movement of the slider along the fastener.

The principal object of the invention is to provide an improved construction of locking slider, the fabrication and assembly of which is accomplished in relatively few simple operations.

Another object of the invention is to provide a locking slider having a better spring action than prior known sliders of this type.

A further object of the invention is to provide a locking slider which is simple and sturdy in construction and which will operate satisfactorily over a long period of time.

Other objects of the invention as well as the advantages and novel features of construction of the slider of this invention will appear from the following description thereof, when read in connection with the accompanying drawings, in which:

Fig. 1 is a front view of a portion of a fastener equipped with a slider embodying the features of this invention;

Fig. 2 is a side view of the parts shown in Fig. 1;

Fig. 3 is an enlarged side elevational view of the locking assembly on the slider;

Fig. 4 is a plan view of the pull tab of the slider;

Fig. 5 is a top plan view of the slider body;

Fig. 6 is a side view, partly in section, of the complete slider;

Fig. 7 is a top plan view of an incomplete modified form of slider; and

Fig. 8 is a side view, partly in section, of a complete slider made from the construction shown in Fig. 7.

Referring more particularly to Figs. 1 to 6 of the drawings, the fastener illustrated is of customary type having flexible tape stringers 10 and 11 with rows of interlocking elements 12 and 13, respectively, secured to the opposed edges of such stringers and constructed and arranged so that they can come together and interlock properly in interfingered relation. The engagement and disengagement of the interlocking elements 12 and 13 are controlled by the longitudinal movement of a slider having a body portion provided with a conventional Y-shaped interior channel for guiding the interlocking fastener elements into and out of engagement. The body portion of the slider comprises two wings or plates 14 and 15 which are connected at their upper ends by an integral transverse connection or neck portion 16. The plates or wings 14, 15 and neck portion 16 are made from a single piece of material which, after it has been processed to complete the form of the wings 14 and 15, is bent in the region of the neck portion 16 to bring such plates into the relation shown in Figs. 2 and 6 of the drawings. The plate 14 constitutes the outer or front wall of the slider and is disposed in spaced, substantially parallel relation to the other plate 15 which forms the inner or rear wall of the slider. During the aforesaid bending operation the neck portion 16 is transformed from

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a flat rectangular shape into a depending fold which is V-shaped in cross-section, as can be seen more clearly in Figs. 5 and 6 of the drawings. This depending fold forms a wedge-shaped divider or separator at the upper end of the slider between the two wings 14 and 15 thereof. The two wings 14 and 15 are provided with lateral guide flanges 17 and 18, respectively, to define the outer margins of the interior channel through which the interlocking elements travel when the slider is moved longitudinally of the stringers. It will thus be seen that the wings 14 and 15, the flanges 17 and 18, and the outer side walls of the V-shaped neck portion 16 define the interior Y-shaped channel composed of a central leg 19 in the lower portion of the slider (note Fig. 5), and two diverging arms 20 and 21 in the upper portion of the slider, or in the region of the said V-shaped neck portion 16.

As shown in Fig. 5 of the drawings, the front plate 14 is provided with a pair of transversely spaced openings 22, 22 located adjacently below the neck portion 16 and formed to receive the legs 23 of a hollow housing 24. The front plate 14 is also provided adjacent to its lower end with an opening 25 through which extends the free end of a spring member 26 located in the housing 24. The housing 24 is made from an integral piece of spring sheet metal such as spring bronze and has a top or outer wall 27 and side walls 28, 29. The outer wall 27 is elongated and substantially rectangularly-shaped, and the side walls 28, 29 are integrally connected along the side edges thereof. The side walls are cut out to provide aligned open recesses having substantially semi-circularly-shaped edges 30. Extending from the side walls 28, 29 above the recess edges 30 are the legs or extensions 23 of such width that shoulders 31, 31 are formed between such legs and the edges 30. The spring 26 is integral with the upper end of the top wall 27 and is bent inwardly and downwardly therefrom to extend for a portion of its length to a point between the side walls 28, 29 in the region of the legs 23 adjacent to the inner edges of such side walls. From such point the spring 26 is bent in the form of a curve approximating the curvature of the recess edges 30, such spring at the outermost point on such curve being closely adjacent to the under surface of the top wall 27. The free end of the spring projects beyond the inner edges of the side walls at the lower ends of the edges 30. The terminal end of the spring preferably is formed (note Fig. 7) so that such end will enter into the spaces between adjacent fastener elements in one of the rows of such elements in the use of the slider. Integral with the bottom end of the top wall 27 is an extension 32 which is bent to be disposed at substantially right angles to such top wall and which has a length greater than the width of the side walls so that it projects beyond the inner edges of the side walls. The free end of the extension 32 is bent to provide a lip 33 to be inserted in a short slot formed on the under surface of plate 14 at the lower end thereof, as shown more clearly in Fig. 6 of the drawings.

It will be seen from the foregoing that the outer wall 27 constitutes the intermediate part of an elongated strip the ends of which are formed into the spring 26 and the extension or latch 32 and to the side edges of which are integrally connected the side walls 28, 29. When a piece of sheet metal is cut to provide such parts and worked to the form shown in Fig. 3, the housing 24 is permanently secured to the slider plate 14 by inserting the legs 23 into the openings 22 and the free end of the spring 26 into the opening 25. The housing is pressed into position until the shoulders 31 defining the inner edges of the side walls of such housing rest on the outer surface of plate 14. The legs 23 are permanently secured in the apertures 22 by distorting them in any suitable fashion,

as by peening the inner ends thereof. The lower end of the housing is secured to the plate 14 by latching the lip 33 of extension 32 in the slot formed on the under surface of plate 14 and fastening such lip in its latched position in any suitable manner.

Prior to the attachment of the housing 24 to plate 14 of the slider, one end of such housing is threaded through the opening 35 of a pull tab 36 so that the solid transverse tab bar 37 is located in the area defined by the recess edges 30 of the housing. Thus when the housing is attached to slider plate 14, the pull tab through bar 37 will be permanently secured to the slider by the recess edges 30.

With the housing 24 and pull tab 36 properly assembled on the housing, the end of spring 26 will extend into the channel formed between the slider plates 14, 15 a sufficient amount to enter into the spaces between adjacent fastener elements contained in such channel to lock the slider in position on the fastener if no force is being exerted on the pull tab. When the pull tab is grasped to move the slider from such locked position in either direction on the fastener, the bar 37 thereof will engage the curved portion of spring 26 in the region defined by the recess edges 30 and press such spring so as to cause the end thereof to be withdrawn from its locking engagement with the fastener elements in the slider. The extent of outward movement of the spring 26 by the pull tab 36 is limited by the inner surface of the top wall 27 of the housing. Inasmuch as movement of the spring is confined by the top wall 27 and the recess edges 30 to a range just enough to free the slider, the spring will retain its effectiveness for a long period of time. It will also be noted that this construction permits of the use of a pull tab having a solid bar 37 which adds strength to the slider and minimizes possible twisting of the pull tab relative to the housing 24. During movement of the slider on the fastener, the locking end of the spring 26 will be maintained by the pull tab in a withdrawn or unlocked position and will not hinder such movement. When the slider has reached the desired position and the pull tab is released, the spring 26 will immediately move to a position where its terminal end can engage in interlocking relation with the fastener elements in the slider. It will be noted that in the use of the slider the only moving part of the housing which is permanently secured in fixed position on the slider plate 14 is the spring 26 which being made of the same thickness of material as the housing is fairly substantial and strong and which being integral with the material of the housing and arranged in the manner described will maintain its effectiveness over a long period without any danger of becoming inoperative even when subjected to very rough usage. Because the sides of the opening 35 in the pull tab are maintained in position by the solid integral bar 37, there is no danger of such sides spreading to effect its usefulness or proper relation with the housing.

Instead of forming the housing separate from the slider body, both the housing and the slider body may be formed from a single piece of sheet material as shown in Fig. 7 of the drawings. In this construction, the extension or end wall 32' of the housing is integral with the lower end of the outer plate 14' of the slider body. In fabricating this construction, the slider body and the housing are worked simultaneously to the form shown in Fig. 7. The spring 26' is then worked to its desired form, the pull tab placed in proper position on the housing, and then the housing is bent about wall 32' and secured to the top plate 14' through the legs 23'

and openings 22' in the manner previously described to complete the formation of the slider as shown in Fig. 8 of the drawings. This form of construction reduces the steps of operation and provides a very strong slider which can withstand a great deal of rough usage without damage.

While I have described and illustrated preferred embodiments of my invention, it will be apparent to those skilled in the art that various changes and modifications may be made therein without departing from the spirit of the invention or the scope of the appended claim.

I claim:

An automatically locking slider for separable fasteners comprising a slider body having an outer plate provided with a plane outer surface and provided within the area of such plane surface with a pair of transversely spaced openings in the upper part thereof and a centrally disposed opening in the lower part thereof, a unitary member seated on said planar surface and comprising a top wall, side walls having their outer edges integral with the side edges of said top wall and having their inner edges seated on said planar surface, a pair of extensions at the upper ends of said side walls extending transversely of said top wall and beyond the inner edges of said side walls to project into said pair of spaced openings in said outer plate, said extensions being distorted to permanently secure the same in said openings, said side walls having aligned recesses between said extensions and the lower ends thereof, an end wall integral at its outer end with the lower end of said top wall, means for permanently securing the inner end of said end wall to the lower end of said top plate, whereby said unitary member is permanently seated on said planar surface through said end wall and the extensions of said side walls, and said unitary member including a spring member integral at one end with the upper end of said top wall and extending from the top wall inwardly toward said outer plate to substantially close the other end of the chamber defined by said top, side and end walls, then extending from said outer plate between said side walls towards said top wall and then extending from said top wall in a curved fashion downwardly and inwardly toward and through said central opening, the end of said spring member projecting through such central opening into the interior of said slider body in a plane substantially at right angles to said planar surface and functioning as a locking member to normally engage in the space between two adjacent elements of a separable fastener within said slider body, said spring member in the region of said recesses having a concaved contour with the highest part adjacent to said top wall, and a pull tab having at one end a central opening large enough to enable one end of said unitary member to be threaded therethrough and closed at such end of said pull tab by a continuous transverse bar, said bar extending through the recesses in the side walls of said housing and being positioned between said concaved portion of said spring member and said planar surface of the slider body.

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