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SLIDE FASTENER SLIDER
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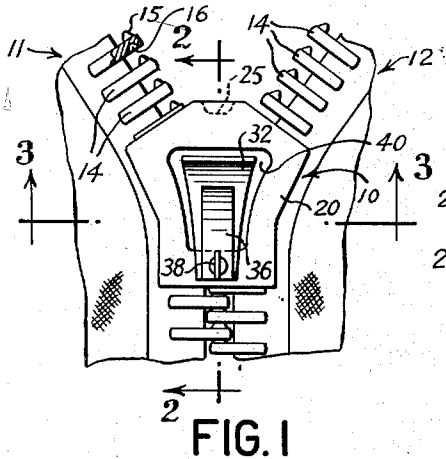


FIG. 1

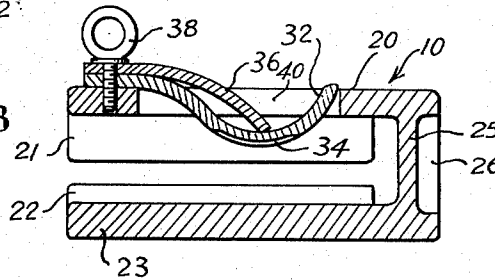


FIG. 2

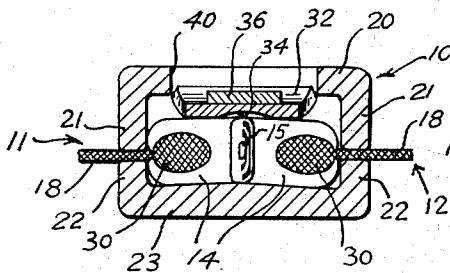


FIG. 3

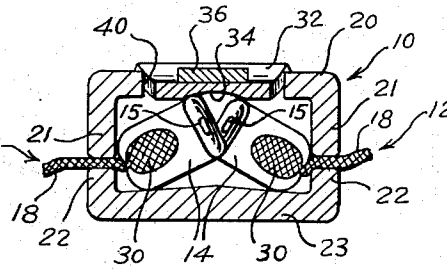


FIG. 4

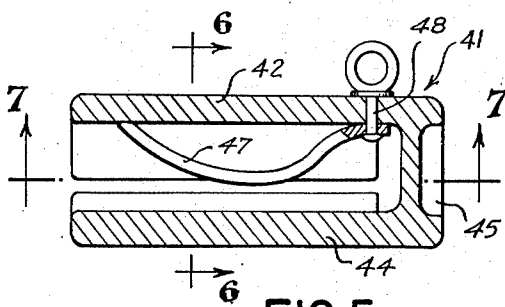


FIG. 5

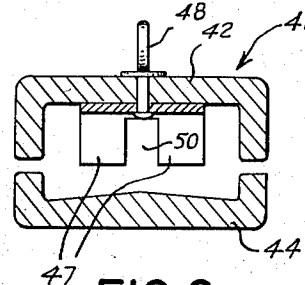


FIG. 6

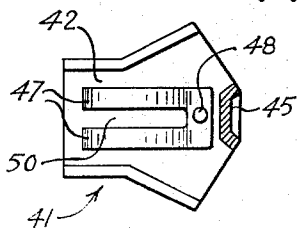


FIG. 7

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SLIDE FASTENER SLIDER

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7 Claims. (Cl. 24—205.15)

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This invention relates to slide fasteners and more particularly to the slider that is moved in one direction along a fastener to bring the elements together into interlocking relation and in the opposite direction for separating the fastener elements.

Slide fasteners are always used near seams or hems when applied to cloth garments. At the placket of a dress, and in many other uses, there is a hem on either side of the fastener providing cloth that overlaps and covers the fastener to conceal it. In garments that leave the slide fastener exposed, there is a seam on both sides of the fastener connecting the stringer tape to the garment; and beyond these seams there are usually free edges of both the tape and the garment material.

Such edges and overlapping hems sometimes come between the opposite sides of the fastener when it is closing; and so does the cloth of the undergarments, especially when the undergarments are of thin material. Most users of slide fasteners have had, at one time or another, the experience of jamming a fastener on a piece of cloth. Sometimes it is necessary to cut the cloth away to free the slide fastener and this may destroy a garment. One object of the invention is to provide an improved slider that will not become jammed when cloth gets between the stringers of the fastener while it is closing.

When the slider of this invention runs over an edge of cloth, the slide fastener elements stop engaging, and further movement of the slider leaves the fastener elements separated so that the cloth can be easily removed and will not be torn. The slider is constructed so that it can move back over the disengaged fastener elements far enough to again slide on the closed portion of the fastener beyond the region where the cloth obstruction was first encountered. The slider is then moved forward again to continue the progressive closing of the fastener. It may be said that another object of the invention is to provide a slider that can pass over slide fastener elements without closing them when cloth gets between the elements.

The ability of the slider of this invention to move backward over disengaged elements of a slide fastener is an important advantage. Slide fasteners subject to substantial strains, such as sometimes encountered on luggage, leggings, and a number of other articles, occasionally pull open, especially if the slide fastener is old and the engaging elements have become worn. There has been no convenient way in which conventional fastener elements of the prior art could be closed again if they burst open behind the slider. With this invention the slider can be moved back over the open part of the slide fastener and then pushed forward to close the fastener again after the excessive strain has been removed.

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One feature of the invention relates to a yielding construction that permits the fastener elements to move apart within the slider when force is applied between the fastener elements, as in the case of cloth caught in a fastener, but the yielding construction is of such a nature that it does not permit the fastener elements to move apart in response to external pull applied to the tapes to which the fastener elements are connected. The slide fastener of this invention can be closed against just as much transverse pull, therefore, as any conventional slide fastener not having the yielding construction of this invention.

Other objects, features, and advantages of the invention will appear or be pointed out as the description proceeds.

In the drawing, forming a part hereof, in which like reference characters indicate corresponding parts in all the views,

Figure 1 is a front view of a portion of a slide fastener equipped with a slider embodying this invention.

Figure 2 is a sectional view through the slider of Figure 1, the section being taken on the line 2—2, without the slide fastener elements.

Figure 3 is a transverse sectional view taken on the line 3—3 of Figure 1.

Figure 4 is a view similar to Figure 3 but showing the way in which the slide fastener elements move through the slider without engaging when they encounter an obstruction such as a piece of cloth between the stringers.

Figure 5 is a front elevation showing a modified form of the invention.

Figures 6 and 7 are sectional views taken on the lines 6—6 and 7—7 of Figure 5.

Figure 1 shows a slider 10 operating on stringers 11 and 12 each of which comprises a beaded tape to which individual fastener elements 14 are connected in the usual manner. Each of the fastener elements 14 has a head portion with a projection 15 on its upper face and a corresponding recess 16 in its lower face for receiving a projection of a complementary fastener element of the other stringer. The fastener elements of the stringers 11 and 12 are shown engaged in Figure 1 beyond the lower end of the slider 10.

The slider 10 comprises a front wing 20 with side flanges 21. The slider has a rear wing 23 with side flanges 22 which are slightly lower than the flanges 21 in the illustrated embodiment of the invention. The front and rear wings 20 and 23 are connected together at their upper ends by a neck portion 25 in which a recess 26 is formed to provide upper guide surfaces for the stringers 11 and 12 as they enter and leave the top openings of the slider. The flanges of the wings provide guide surfaces for the rearward ends of the slide fastener elements.

The inside surface of the rear wing 23 has an

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angular contour; it is higher at the center so that when the fastener elements 14 are held against this inside surface, they form, in effect, a toggle with the slider elements constituting the links of the toggle and disposed at an angle to one another. In actual practice the dihedral angle formed by the inside face of the rear wing can be as great as 176°, but a smaller angle is used in the drawing for clearer illustration, and the angles that the center lines of the elements 14 make with one another in Figure 3 is considerably less than 176°.

Figure 3 shows individual fastener elements 14 attached to beads 30 of the tapes 18. The tapes extend through slots between the spaced ends of the flanges 21 and 22. The rearward ends of the fastener elements 14 contact with the inside walls of the flanges 21, as shown in Figure 3, and are brought together by these inside surfaces which act as guides for the stringers as the slider moves along the stringers and brings the fastener elements together.

The fastener elements 14 are held against the angular wall of the rear wing 23 by a spring 32 that bears against the front faces of the fastener elements. In order to have the spring 32 exert its pressure against the fastener elements 14 beyond the center or vertex line of the rear wing face, the spring 32 is made with a center recess 34 providing a slight clearance between the spring and the inner ends of the fastener elements. With springs of thin material, a slot is substituted for the recess 34.

The pressure of the spring 32 is augmented by an auxiliary spring 36 and both of these springs 32 and 36 are attached to the front wing 21 by a screw 38. An eye at the top of the screw 38 is used for connecting a pull tab to the slider. The screw 38 threads into the front wing 20, but when the slider is made of material not thick enough for threading, a rivet is substituted for the screw 38. The thickness of the springs 32 and 36 is exaggerated in the drawing for clearer illustration.

The spring 36 extends through an opening 40 in the front wing 20 and contacts with the fastener elements 14 in the region where they first come into engagement with one another. The free end of the spring 32 preferably turns upward and projects back into or above the opening 40 so that it is not possible for any cloth to come between this free end of the spring 32 and the front wing 20.

The operation of the slider, in the event that any cloth does come between the fastener elements 14 is best shown in Figure 4. The action of the cloth is to hold the fastener elements apart against the pressure of the flange 21 which pushes the elements together as the slider moves along the stringers. Because of the angularity of the fastener elements 14 with respect to one another, the force exerted by the flanges 21 causes the toggle to break forward away from the rearward wing 23 so that the elements do not engage but merely overlap at their extreme ends as shown in Figure 4.

It will be apparent from a comparison of Figures 3 and 4, however, that pull on the tapes 18 does not prevent the flanges 21 from bringing the fastener elements 14 close enough together to engage. The yielding means provided by the springs 32 and 36 is effective only in the case of force set up as the result of an obstruction between the fastener elements. This is important because it means that the invention can

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be used on luggage, leggings, footwear and other articles where the slider must exert considerable pull on the tapes in bringing the stringers together to engage the fastener elements.

Figures 5 to 7 show a modified form of the invention in which the slider has a front wing 42, corresponding to the wing 20 of Figures 1 to 4 but without the opening 40. The slider 41 has a rear wing 44 similar to the rear wing 22 and connected to the front wing by a recessed neck portion 45 which is similar to the construction shown in Figures 1 to 4.

In the slider 41 of Figures 5 to 7, however, a different spring construction is used for holding the slide fastener elements against the rear wing 44. This spring construction comprises a leaf spring 47 anchored to the inside surface of the front wing 42 by a rivet 48 that has an eye at its outer end for holding a pull tab. The spring 47 is bowed to contact with the fastener elements in the region where they come into engagement with one another, and for some distance beyond this region. The free end of the spring 47 slides along the inside surface of the front wing 42 to allow for changes in the amount of bow in the spring, and this free end of the spring 47 is preferably pointed in order to contact with the front wing without leaving any end surface on which a piece of cloth can catch.

Figures 5 and 7 show the spring 47 made with a slot 50 so that it will exert pressure against only the rearward portions of the slide fastener elements beyond the overlapping ends of the complementary fastener elements. This causes the fastener elements to be held firmly against the dihedral inside surface of the rear wing 44.

The preferred embodiments of the invention have been illustrated and described but changes can be made and some features of the invention can be used in different combinations without departing from the invention as defined in the claims.

What is claimed is:

1. A slider for bringing together progressively into interlocking engagement the successive fastener elements of confronting stringers having tapes with the slide fastener elements secured thereon in spaced relation to one another, said slider comprising front and rear wings, each of which is of greater width at its upper end, flanges along the side edges of the wings, the flanges of each wing extending toward the flanges of the other wing to leave a clearance for the tapes of the slide fastener stringers, and the flanges on the front wing being higher than the flanges on the rear wing so that the clearances for the tapes are nearer the rear wing than the front wing, a neck portion connected with the upper ends of both wings for holding the wings in the desired spaced relation to one another, said neck portion dividing the space between the upper ends of the wings into branch passages for bringing slide fastener stringers together to engage the fastener elements of said stringers, and said neck portion being a bent-over part of the same piece of material as the front and back wings and having a box-like depression therein for stiffening the construction, the rear wing having surface areas on its inside face disposed at an angle of the order of 174° to one another and meeting along a center ridge that extends generally parallel to the stringers, and spring means secured to the slider and in position to urge the fastener elements of the respec-

tive stringers against said surface areas of the rear wing on opposite sides of said ridge.

2. The combination defined in claim 1 and in which the spring means comprise a leaf spring secured to the front of the front wing and extending rearwardly through an opening in the front wing for contact with the fastener elements, and then forwardly through said opening so that both ends of the spring are outside of the slider.

3. The combination defined in claim 1 characterized by spring means enclosed within the slider and comprising a leaf spring anchored at one end against an inside surface of the slider and having its other end free to move as the spring bends.

4. A slider for bringing together progressively into interlocking engagement the successive fastener elements of confronting stringers having tapes with the slide fastener elements secured in spaced relation to one another, said slider including a front and a back wing, a neck portion connecting the wings at their upper ends and holding the wings in spaced relation to one another, flanges on the wings providing guide surfaces for bringing elements of confronting slide fastener stringers together for engagement with one another, the spacing between said wings being substantially wider than the slide fastener elements and sufficient for passage of the stringers with the fastener elements disengaged from one another when the fastener elements on the stringers are disposed at a predetermined acute angle to one another, one of the wings having an inside face with an angular surface comprising two areas that converge upward and meet in a ridge extending lengthwise of the slider, the angle between said areas being substantially greater than said predetermined angle, and spring means for holding the fastener elements against the respective areas of said inside face.

5. A slider for bringing together progressively into interlocking engagement the successive fastener elements of confronting stringers having tapes with the slide fastener elements secured thereon in spaced relation to one another, said slider comprising front and rear wings, each of which is of greater width at its upper end, flanges along the side edges of the wings, the flanges of each wing extending toward the flanges of the other wing but terminating short of the flanges on the other wing to leave a clearance for the tapes of the slide fastener stringers, a neck portion connected with the upper ends of both wings for holding the wings in such spaced relation to one another that the passage through the slider is of sufficient cross-section to pass the slide fastener stringers when they are disengaged and in angular relation to one another, said neck portion dividing the space between the upper ends of the wings into branch passages for bringing slide fastener stringers together to engage the fastener elements of said stringers, the rear wing having surface areas on its inside face disposed at an acute angle substantially less than 180° to one another and meeting along a center ridge that extends generally parallel to the stringers, and spring means secured to the slider and in position to urge the fastener elements of the respective stringers against said surface areas of the rear wing on opposite sides of said ridge.

6. A slider for bringing together progressively

into interlocking engagement successive elements of confronting stringers having tapes with the slide fastener elements secured thereon in spaced relation to one another, said slider comprising a rearward portion having a face that contacts with the backs of the fastener elements, said face having two surfaces at an obtuse angle to one another and meeting along a center ridge that extends in the direction of movement of the slider and that is located in a mid-position at which the elements of the respective stringers come together, guide means on the slider in position to contact with the opposite ends of the fastening elements of the respective stringers on both sides of the tape for drawing said fastener elements together and into engagement with one another, and spring means on the slider in position to contact with the fronts of the fastener elements of both stringers and to hold said fastener elements against the angular surfaces of the rearward portion of the slider at a region where the fastener elements are engaged with one another, the opening in the slider between the spring means and the face of the rearward portion being sufficient, when the spring means are flexed away from the rearward portion, for passage of unengaged fastener elements that are at an obtuse angle to one another, which angle is smaller than that between the two surfaces that meet along the center ridge.

7. A slider for bringing together progressively into interlocking engagement successive fastener elements on confronting stringers having tapes with the slide fastener elements secured thereon in spaced relation to one another, said slider having a rearward wall with surfaces that meet at an angle along a ridge extending in the direction of movement of the slider, and said slider having a passage therethrough and having guides that restrict the width of the passage to a dimension that requires the fastener elements to engage with one another in order to pass through the passage when the fastener elements are held against the angular areas of the rear wall of the slider, a front wall on the slider forming the forward wall of the passage and spaced from the rearward wall sufficiently far to permit passage of the unengaged fastener elements when said fastener elements are in an angular relation which angle is substantially smaller than the angle between the angularly related areas of the rear wall, and spring means bearing against the fastener elements of both stringers at a region along the length of said passage and on the sides of the fastener elements opposite the angularly related areas for holding the fastener elements of the respective stringers against said areas and for holding said fastener elements from assuming angular relations with one another in which the angle between the fastener elements is less than the angle between the areas of the rear wall.

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