Oct. 27, 1959 J. E. BURBANK 2,909,824

BATWING SLIDER

Filed July 25, 1955

FIG.1.

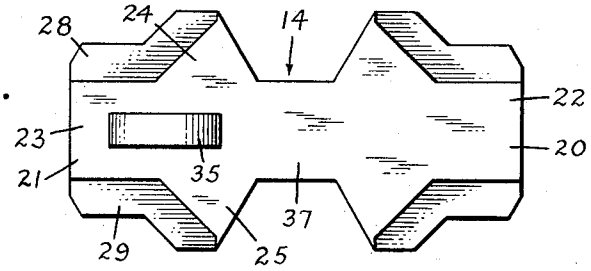


FIG.2.

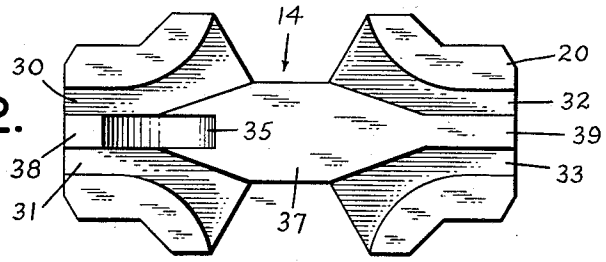


FIG.3.

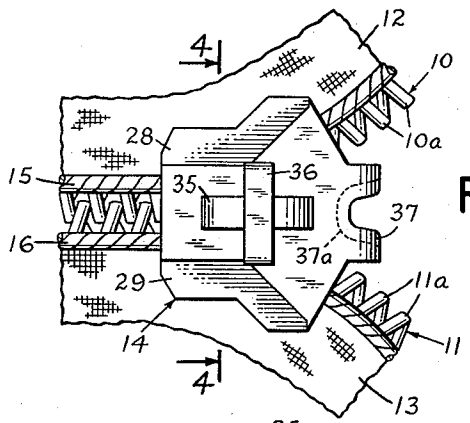
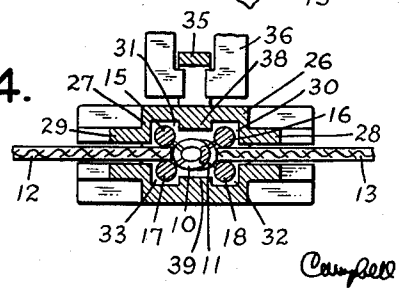


FIG.4.



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BATWING SLIDER

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4 Claims. (Cl. 24—205.15)

This invention relates to improvements in slide fasteners and it relates particularly to improvements in the sliders for slide fasteners of the spiral or coil type of the kind disclosed generally in the Wall Patents Nos. 2,300,442 and 2,300,443 and the Schwartz application Serial No. 346,380, filed April 2, 1953, now Patent No. 2,858,592.

While it would appear a slider which can be used on a conventional metallic tooth or scoop type of slide fastener, should be usable with equal facility on a spiral fastener of the type described, as a matter of fact, such sliders are not satisfactory. The conditions of use on the spiral or coil type of fastener are quite different from those of the metallic scoop or tooth type of fastener. In the latter case, the teeth or scoops are manufactured to relatively close tolerances. They are generally rectangular in shape and have relatively sharp corners thereon and surfaces at their outer edges at essentially right angles to the plane of the tapes to which they are attached. The sliders used with such fasteners can be provided with simple edge flanges which engage the surfaces at the outer edges of the teeth and are guided thereby for relatively free sliding movement. Due to the accuracy of the shape the teeth, and their closely spaced relation there is little danger of the slider becoming detached from the fastener elements by passing between the teeth even when the fastener is subjected to tension of high magnitude tending to pull the fastener elements apart.

When attempts were made to use sliders of the type described on the spiral or coil type of fastener, it was found that the rounded convolutions or loops of the slider did not afford a satisfactory guide surface for the flanges of the sliders. Moreover, the flexibility of the coils enabled the flanges on the sliders to compress the loops and to pass between the loops when the coils are subjected to transverse tension during closing, with the result that the slider becomes detached from one of the coils of the fastener. Attempts were made to overcome this disadvantage by flaring the leading end of the slider and while some improvement in operation was achieved, nevertheless the results were not all that were to be desired. For example, increased friction in use resulted from the need to fit the flanges of the slider more closely to the rearward or outer curved surfaces of the coils and this, in turn, caused wear not only on the coils but on the fabrics or tapes to which the coils were attached. To overcome this disadvantage, bead or guide cords were formed at the junction zone of the tapes and the coils in order to form guide rails for the slider. The guide beads improve the operation of the fastener but the side flanges of the slider still could slip over constricted portions of the guide cord or beads and thereby become detached. A closer spacing of the flanges of the slider to bring them closer to the opposite surfaces of the tape helped but had the disadvantage of greatly increasing the wear on the tape and the cord or bead so that the life of the fastener was shortened undesirably.

In accordance with the present invention, a slider has been provided which overcomes all of the defects of the prior sliders and can be used with a spiral or coil type of fastener with complete satisfaction. The structure of the slider is such that it can fit closely with respect to the opposite sides of the tape or fabric to which the coil elements are secured against the guide beads without introducing friction and wear which shorten the life of the fastener.

More particularly, the advantages pointed out above are obtained by providing laterally extending flanges on the edges of the slider to afford a widened zone of contact between the slider flanges and the tapes or fabric to which the coils are secured and also providing transversely thickened portions which prevent entry of the ends of the slider flanges between the turns of the bead and the loops or convolutions of the coil thereby effectively preventing detachment of the slider from the fastener. The widened flanges also have the advantage of flattening or smoothing the fabric or tape to which the coils are attached so that the slider moves along the tape smoothly and with little drag or friction. Moreover, the absence of sharp corners or edges on the flanges of the slider prevent wedging and wear on the tape and the beads of the slide fastener.

The flanges have the additional advantage of increasing the section modulus of the slider body thereby facilitating the folding or formation of the slider blank and assuring a more rigid type of structure even in sliders used in conjunction with fasteners having very small coils.

For a better understanding of the present invention reference may be had to the accompany drawings in which:

Fig. 1 is a top plan view of a partially formed blank from which a slider of the type embodying the present invention is made;

Fig. 2 is a bottom plan view of the slider blank;

Fig. 3 is a plan view of a completed slider illustrated in use with a typical coil type of fastener element; and

Fig. 4 is a view in cross section taken on line 4—4 of Fig. 1.

The invention will be described with reference to a slider of the type suitable for use with a coil type fastener of the kind shown in the Wall Patents Nos. 2,300,442 and 2,300,443 and the Schwartz United States application Serial No. 346,380, filed April 2, 1953, now Patent No. 2,858,592. As shown in Figure 3, the fastening elements of such slide fasteners include coils **10** and **11** formed of "nylon" or similar plastic or metal filaments of oblong cross section. The filaments are formed into generally flattened or oval cross loops **10***a*, **11***a*, etc. The coils **10** and **11** are secured by stitching or in any other suitable way to fabric tapes **12** and **13** and guide surfaces for a slider **14** of the type embodying the present invention are afforded by four bead cords **15** and **16**, **17** and **18** secured to the tapes **12** and **13** adjacent to the coils **10** and **11**. The slider **14** embodying the present invention can be formed by stamping a blank **20** out of a strip of metal and deforming the body properly to form the top and bottom sections **21** and **22** of the slider which are connected by means of a neck portion **37**. The top and bottom portions of the slider are essentially identical and include a generally rectangular central section **23** with outwardly extending triangular wing portions **24** and **25** thereon. They also include, as shown in Figure 4, downwardly extending side flange portions **26** and **27** to which are joined outwardly extending wing or flange portions **28** and **29** of substantial width. As shown in Figure 1, the wing portions **28** and **29** extend along the sides of the rectangular body portion **23** outwardly sub-

stantially into coincidence with the ends of the triangular portions 24 and 25.

The inner surfaces of the slider sections 22 and 23 are provided with pairs of grooves 30, 31 and 32, 33 which cooperate with the guide beads 15 to 18. In the trailing end of the slider, the slots 30 to 33 are parallel while the leading ends of the grooves are flared outwardly to receive and guide the fastener elements into meshing relation. By making each flange 28 and 29 at least equal to the width of a groove 30 to 33 they are substantially wider than the thickness of a bead and cannot slip through a thinner section of a bead cord where, for example, a stitch or retaining thread passes through or around it.

As illustrated in Figures 1 and 2, a bail or eye 35 is stamped out of the top section 23 of the slider to receive an operating tab 36 as shown in Figures 3 and 4.

The slider is shaped into its completed form by bending the neck portion 37 into a U-shaped cross section to dispose the top and bottom sections of the slider in properly spaced relation to receive the tapes 12 and 13, the coils 10 and 11 and the beads 15 to 18 inclusive which fit in the grooves 30 to 31. The neck 37 may be provided with a corrugation or rib 37*a* to strengthen it.

A close and accurate fit of the slider to the tapes, beads and the coils of the fastening elements can be established so that a smooth sliding motion is obtained and all possibility of inadvertent separation of the slider from the fastener elements is prevented. Centrally located lands 38 and 39 between the grooves 30, 31 and 32, 33 aid in positioning the coils 11 and 12 with respect to each other and guiding them into interlocking relation.

As will be evident from the disclosure of Figure 3, the laterally extending wings 28 and 29 and the flanges 26 and 27 are of such extent that they cannot slip between the twisted yarns of the guide beads and between closely spaced loops or convolutions of the coils 10 and 11.

Despite the close fit of the flanges 28 and 29 with respect to the tapes 12 and 13, wear and friction are kept at a minimum because the increased surface area enables distribution of the stresses and pressures thereon and exerts an ironing or pressing action which smooths out any wrinkles or ripples that may form in the tapes due to stresses or wear thereof.

The new sliders are found to be entirely practical for coil types of fasteners and have overcome the disadvantages of the sliders used heretofore with the coil type fasteners.

It will be understood that the size of the sliders will be varied depending upon the size of the coils with which they are to be used and that the surface and general configuration may be modified somewhat without departing from the invention. Accordingly, the above described embodiment of the invention should be considered as illustrative and not as limiting the scope of the following claims.

I claim:

1. In a slide fastener having engageable and disengageable interlocking fastener elements having a plurality of spaced convolutions connected to pieces of fabric to secure and release them, and guide beads on opposite sides of said pieces parallel with and adjacent to said

fastener elements; a slider for engaging and disengaging said fastener elements, comprising upper and lower plates in substantially parallel relation to be disposed on opposite sides of said fastener elements and beads, said plates having opposed grooves in the adjacent surfaces for receiving said guide beads slidably, the grooves diverging outwardly at one end of each plate and being substantially parallel adjacent the other end of said plate, a land between said grooves in each of said plates to engage and align said fastener elements, and flanges at the sides of said plates adjacent to the outer edges of said grooves, said flanges having parallel faces opposing each other, the width of each face being at least as great as the width of one of said grooves and greater than the spacing between said convolutions.

2. The slide fastener set forth in claim 1 in which the spacing between the opposed flanges on said upper and lower plates does not substantially exceed the thickness of said pieces of fabric.

3. The slide fastener set forth in claim 1 in which the spacing between the opposed flanges on said upper and lower plates is substantially less than the combined thickness of one of said pieces of fabric and the beads attached thereto.

4. A slider for a slide fastener having flexible interlocking coils having a plurality of convolutions and guide beads adjacent thereto, comprising upper and lower plates joined in parallel relation at one end, each plate having a generally rectangular body portion and substantially triangular wings at one end of opposite sides thereof, said plates having bead-receiving grooves therein in opposed relation, the grooves in each plate being substantially parallel adjacent one end thereof and diverging away from each other in said wings, first flanges extending along the lateral edges of said rectangular body portion and along sides of said triangular wings substantially parallel with the grooves, said first flanges being substantially perpendicular to said plates and extending inwardly therefrom, second flanges at the inner edges of said first flanges, said second flanges extending laterally outward from said first flanges substantially parallel with said upper and lower plates and spaced apart a distance less than the thickness of said coils, said second flanges being wider than the grooves in said plates, and lands on said upper and lower plates between the grooves therein, the spacing between the lands on the plates being greater than the thickness of said coils and the spacing between said second flanges.

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