Jan. 7, 1941. A. F. SICO ET AL 2,227,766

SLIDE FOR SLIDE FASTENERS

Filed Aug. 11, 1939

Fig. 1

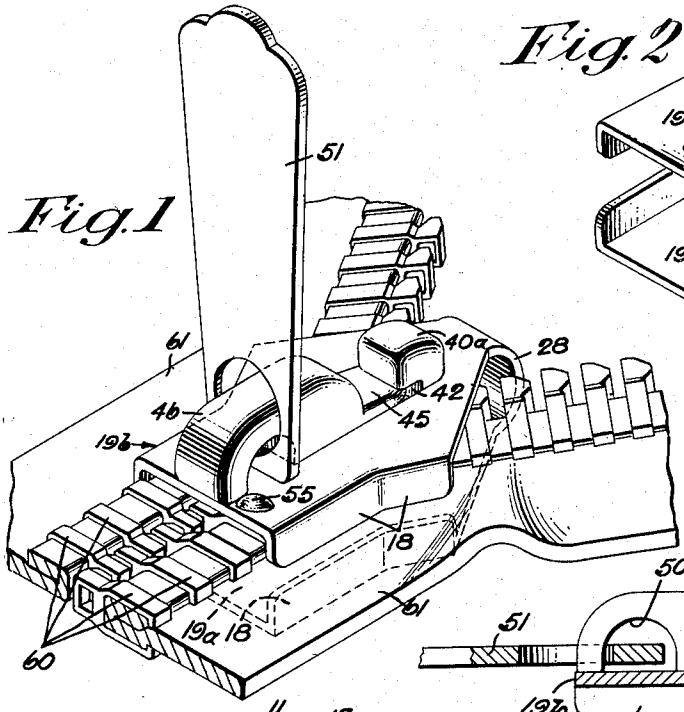


Fig. 2

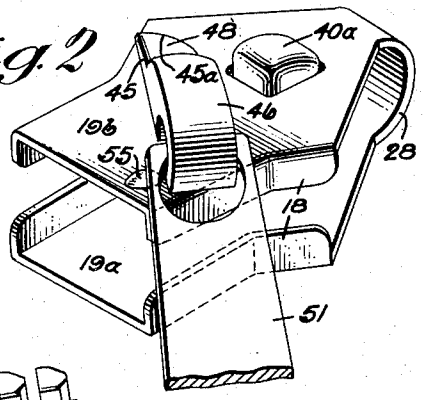


Fig. 3a

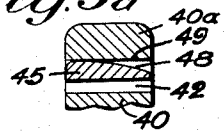


Fig. 3

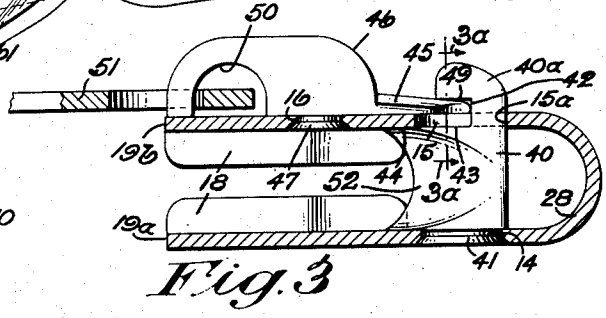


Fig. 5

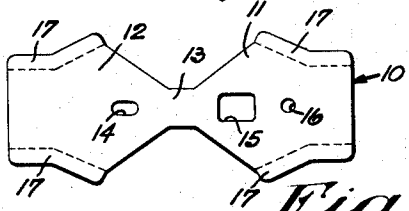


Fig. 6

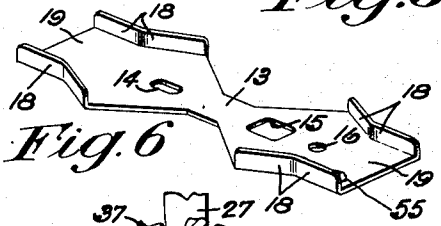


Fig. 4

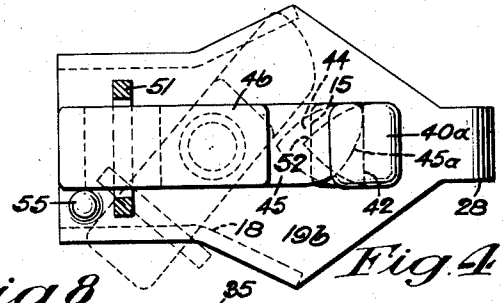


Fig. 8

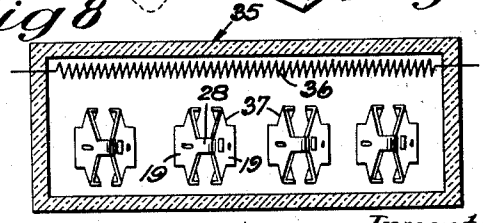
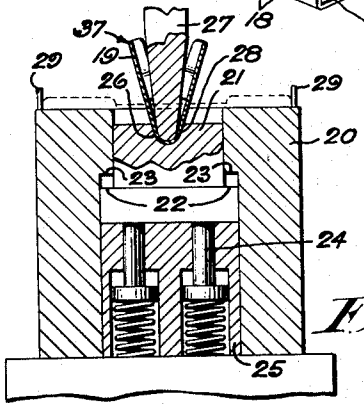


Fig. 7



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SLIDE FOR SLIDE FASTENERS

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Application August 11, 1939, Serial No. 289,528

8 Claims. (Cl. 24—205)

This invention relates to sliders for slide fasteners and more particularly to a removable slider and a method of making the same.

There are several sliders known which can be removed from, and replaced on, their track without requiring expert knowledge and skill, but these sliders have several disadvantages which render their use prohibitive. Most of these sliders have hinged plates and means for interlocking the plates in working coordination. Besides the prohibitive cost of manufacturing plates with accurate hinges and intricately assembling the small parts, the plate-interlocking means have to stand the entire burden of rigidly arresting the plates without any help from the latter, with the result that the interlocking means soon work loose and permit play between the plates. Even the slightest play between the plates renders a slider absolutely unacceptable to the public, and it does not require very much play between the plates to render the slider totally unfit for use, since it takes very little opening of the plates in order to disengage their necessarily low side flanges from the fastener elements of the track. Other sliders are so constructed that the plates thereof may be yielded apart for removal from the track, but these sliders either require releasable means for not only interlocking the plates in working coordination but also for stiffening the entire area of each plate which results in a bulky and unsightly slider totally unsuited for wearing apparel, or these sliders are made up of rigid plates and a separate resilient connector at one end of the plates, which entails intricate operations, particularly in the assembly of the parts, and, hence, a high production cost.

It is the primary aim and object of the present invention to provide a slider whose top and bottom plates and connecting yoke are made from a single blank of metal, whereby the top and bottom plates are rigid enough to dispense with any special stiffening or reenforcing means, other than the plate-interlocking means, while the yoke is sufficiently resilient to permit removal of the plates from the track on their release from the plate-interlocking means.

It is another object of the present invention to devise a method of making sliders of this type.

Before explaining in detail the present invention it is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawing, since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation, and it is not intended to limit the invention claimed herein beyond the requirements of the prior art.

In the drawing:

Fig. 1 is an enlarged, perspective view of a slide fastener of which the slider embodies the present invention.

Fig. 2 is another perspective view of the slider, showing the top and bottom plates sufficiently separated to permit removal of the slider from its track.

Fig. 3 is a longitudinal section through the slider.

Fig. 3*a* is a fragmentary section taken on the line 3*a*—3*a* of Fig. 3.

Fig. 4 is a plan view of the slider.

Fig. 5 illustrates a metal blank to be formed into the top and bottom plates and the connecting yoke of the slider.

Fig. 6 shows the blank perspectively, with the side edges of the plate portions bent upwardly to provide flanges.

Fig. 7 is a cross section through a device for forming the flanged blank into V-shape.

Fig. 8 is a horizontal section through a heat-treating furnace in which the V-shaped blanks are hardened.

Referring to the drawing and particularly to Fig. 5 thereof, there is shown a metal blank 10, having wide end portions 11 and 12 to be formed into the top and bottom plates, respectively, and a short and relatively narrow middle portion 13 which is to be formed into the plate-connecting yoke. The end portions 11 and 12 are of the same shape as the plates of conventional sliders and have preferably punched-out openings or holes 14, 15 and 16 for purposes hereinafter more fully described. After obtaining the blank as shown in Fig. 5, the marginal side portions 17 thereof are by any suitable means turned to one side of the blank so as to provide the flanges 18 on the end portions 11 and 12 which then constitute the slider plates 19 (Fig. 6). Next, the flanged blank is bent into V-shape. This may be accomplished, by way of example, in the following device. The flat, flanged blank is placed on top of a supporting block 20 and a forming block 21 which is normally yieldingly held flush with said supporting block. For that purpose, the forming block 21 has shoulders 22 which are normally urged into engagement with corresponding shoulders 23 of the supporting block by means of spring-urged plungers 24 which are suitably guid-

ed in a backing block 25. The forming block 21 is provided with a forming cavity 26 of the cross-sectional shape shown in Fig. 7, and cooperating therewith is a preferably power-operated punch 27 to bend the middle portion 13 of the blank into the substantially semi-circular yoke 28 between the top and bottom plates of the slider. To assure accurate alinement of the middle blank portion 13 with the forming means 26 and 27, suitably arranged pins 29 on the supporting block 20 acccurately locate the blank with respect to said forming means.

The basic idea underlying the present invention lies in the formation of a single blank of metal into the customary, rigid top and bottom plates of a slider, as well as a connecting yoke at one end of the plates which is sufficiently resilient to permit movement of the plates to and from each other so as to render the slider capable of removal from its track. To this end, a metal is selected for the blank which has spring properties when heat-treatd to hardness. As the deformation of a blank of a hard and resilient metal in the above described manner would be most difficult and impractical, the metal of the blank is annealed even before the blank is cut out, thereby greatly facilitating the deformation of the blank in the above-described progressive stages. After the formation of the blank into the V-shape illustrated in Fig. 7, the same is subjected to a hardening process which may be undertaken in any suitable manner. Fig. 8. shows, by way of example, a furnace 35 which may be heated by an electrical resistance 36 and hold a plurality of V-shaped blanks 37 which stand on their spread legs that form the top and bottom plates of the slider. After hardening a V-shaped blank 37, it is found that it is only the yoke 28 which is resilient and that the top and bottom plates 19 are of that rigidity which is required of conventional slider plates. This is due to the fact that the considerable width of the plates, as well as the reenforcement or stiffening of the latter by the side flanges 18 thereof, leave no noticeable spring qualities in the plates.

While ferrous metal may be used for the blank, it is preferable to use a non-ferrous metal which is highly corrosion-resistant. A very satisfactory metal to be used for that purpose is, for instance, a copper alloy containing beryllium. Very good results have been obtained with an alloy which is composed of 2 to 2.25% beryllium, .25 to .50% nickel, less than .10% iron, with copper as the remainder. By way of example, a V-shaped blank of this copper alloy in an annealed state has been subjected to approximately 500° F. for one hour, with the result that the top and bottom plates 19 of the slider became rigid rather than resilient whereas the yoke 28 showed very satisfactory spring properties by returning the plates to the original V-shape every time they were further spread apart or forced closer together.

While the above-described method contemplates the bending of the blank into V-shape, it is to be understood that the invention is not intended to be limited to this, as the middle portion 13 of the annealed blank may readily be so bent that the top and bottom plates 19 are in substantial parallelism, i. e., their normal coordination in the operative slider.

Finally, the plate-interlocking means may be applied to the plates 19 in various different ways, depending upon the construction of said interlocking means. Figs. 1, 2 and 3 disclose a suitable type of plate-interlocking means, comprising a post 40 which has a shank 41 received in the opening 14 of the bottom plate 19a. This shank may be riveted, welded, brazed, or otherwise secured to said bottom plate 19a. The post 40 is provided with an extension 40a which normally projects through the opening 15 in the top plate 19b and is provided with a notch 42 whose lower wall 43 extends forwardly to provide a supporting shoulder 44 for said top plate 19b when both plates 19 are substantially parallel to each other as shown in Fig. 3. The top plate 19b is held in firm engagement with said supporting shoulder 44 by cooperation between the notch 42 in the post 40 and a radially extending tongue 45 of a member 46 which is suitably pivoted at 47 in the previously formed hole 16 in the top plate 19b. More particularly, the radially extending tongue 45 of the pivoted member 46 has a transversely extending wedging surface 48 (see Fig. 3a) which cooperates with the top wall 49 of the notch 42 to wedge the top plate 19b into firm engagement with the supporting shoulder 44 of the post 40. The tongue 45 of the member 46 has its front edge formed as a cam 45a which is wedged against the vertical wall of the notch 42 in the post 40 when said member 46 is in the plate-locking position shown in Fig. 1. This secures the advantage that the pivoted member 46 is not only tightly held in its plate-locking position, but the rear wall 15a of the opening 15 in the top plate 15b is also tightly drawn against the post 40, thereby increasing the rigidity of the plates against relative movement in all directions and particularly longitudinally of each other. The end of the member 46 opposite the tongue 45 is recessed at 50 to receive any conventional pull tab 51. The post 40 is also wedge-shaped at 52 (Figs. 3 and 4) to open the track in the conventional manner. In order that the tongue 45 of the member 46 may not easily work out of the notch 42 if the wearer should pull sidewise on the tab 51 while moving the slider back and forth on its track, the top plate 19b has a slightly raised bead 55 which resists rotation of the member 46 out of cooperation with the notch 42 to such an extent as to permit passage of said member more or less only when the latter is willfully and forcefully rocked into plate-releasing position. Conversely, when rocking the member 46 from the plate-releasing position shown in Fig. 2 into the plate-interlocking position shown in Fig. 1, the member has to be forced over the bead 55 before arriving in its plate-interlocking position.

Fig. 1 shows the slider in operative coordination with a track, consisting of two rows of conventional fastener elements 60 on stringers 61, while Fig. 2 shows the slider removed from the track with the top and bottom plates yielded apart and the member 46 in plate-releasing position.

A slider made according to the present method secures several important advantages over the known removable sliders. The most important of these advantages lies in the simplicity of the operations required to obtain the resilient yoke which acts as a fulcrum for the rigid top and bottom plates and is integral with the latter. Thus, the present method precludes the heretofore indispensable, tedious task of making the very small "fulcrum" separately and then se-

curing the same to the small plates, with the result that the cost of manufacture of the slider is greatly decreased and the production of the plates and their "fulcrum" is most uniform and more rapid than heretofore. As far as the resilient yoke alone is concerned, the same is not nearly as bulky as a "fulcrum" which has to be secured to the plates, because the secure attachment of a "fulcrum" to the plates requires more area than the merger of the yoke in the present slider into the top and botton plates thereof.

We claim:

1. A slider for a slide fastener comprising spaced flanged top and bottom plates and a connecting yoke at one end of the plates, the plates and yoke being formed from a single blank of metal and said plates being rigid while said yoke is resilient to permit movement of the plates to and from each other, one of said plates having a fixed locking member extending into close proximity to the other plate and spaced from said yoke, and movable means on the other plate cooperatively associated with said member for releasably interlocking the plates in substantial parallelism with each other.

2. A slider for a slide fastener including spaced flanged top and bottom plates having a connecting yoke at one end of the plates, said plates and yoke being formed from a single blank of metal and said plates being rigid while said yoke is resilient to permit movement of the plates to and from each other, one of said plates having an opening, a post mounted on the other plate and extending between the plates, said posts having a shoulder on which said first mentioned plate rests when both plates are in substantial parallelism, one end portion of the post extending through and beyond said opening, and a member pivotally mounted on said first mentioned plate, said member and said end portion of the post having coacting surfaces for wedging said first mentioned plate into firm engagement with said shoulder on movement of said member from a plate-releasing position into a plate-locking position.

3. A slider according to claim 2, in which said post is wedge-shaped between the plates for opening the track.

4. A slider according to claim 2, in which said end portion of the post has a notch, and said member is pivoted on said first mentioned plate and has a radially extending tongue with a transversely extending wedging surface which is cooperable with a wall of said notch to retain said first mentioned plate in firm engagement with said shoulder.

5. A slider according to claim 2, in which said end portion of the post has a notch, and said member is pivoted on said first mentioned plate and has a radially extending tongue with a camming surface at its front edge cooperating with the bottom of said notch to firmly draw a wall of the opening in said first mentioned plate against the post.

6. A slider according to claim 2, in which said end portion of the post has a notch, and said member is pivoted on said one plate and provided with a radially extending tongue having a transversely extending wedging surface cooperable with a side wall of said notch to retain said first mentioned plate in firm engagement with said shoulder, and the front edge of said tongue is in form of a camming surface cooperating with the bottom of said notch to firmly draw a wall of the opening in said one plate against the post.

7. A slider according to claim 2, in which said end portion of the post has a notch, said member having a radially extending tongue with a transversely extending wedging surface which is cooperable with said notch to retain said firrst mentioned plate in firm engagement with said shoulder, and said first mentioned plate is provided with a raised bead resisting rotation of said member out of cooperation with said notch.

8. A slider according to claim 2, further comprising a handle pivoted on said member for moving the slider on the track.

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