June 23, 1942. M. VOITY 2,287,362

SLIDER

Filed Sept. 16, 1940 2 Sheets-Sheet 1

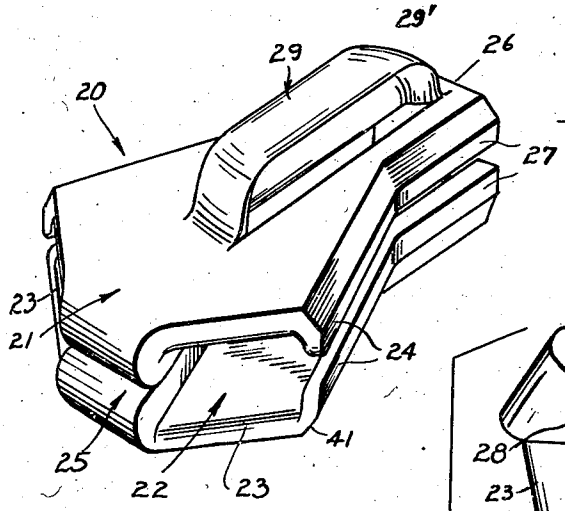
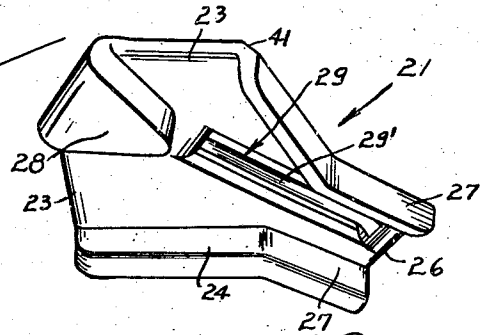


Fig. 1.



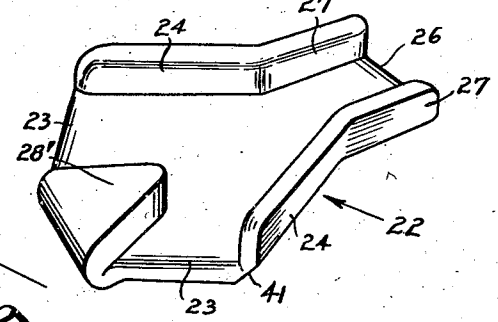
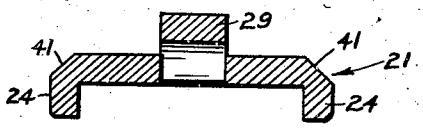


Fig. 2.

Fig. 11.



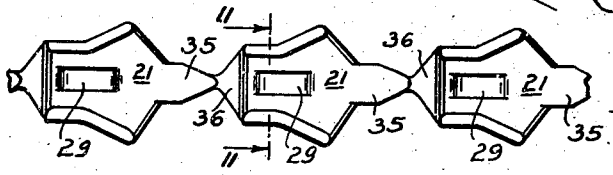


Fig. 10.

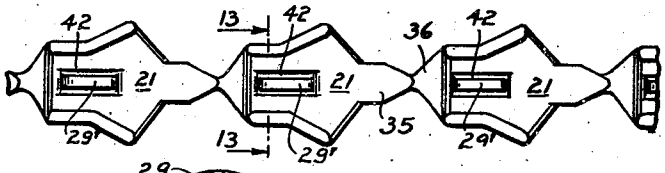


Fig. 12.

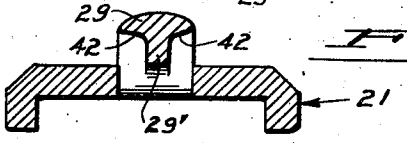


Fig. 13.

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June 23, 1942. M. VOITY 2,287,362

SLIDER

Filed Sept. 16, 1940 2 Sheets-Sheet 2

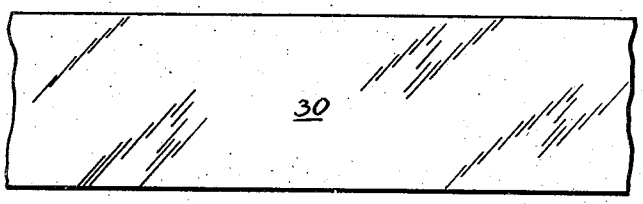

Fig. 3.

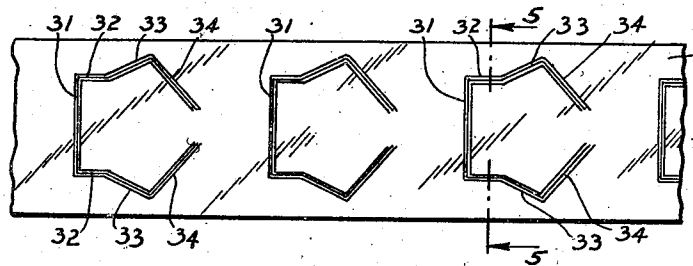

Fig. 4.

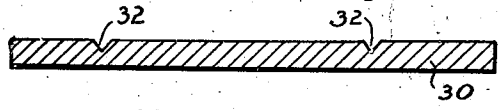

Fig. 5.

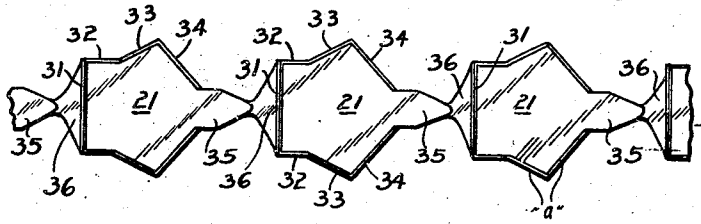

Fig. 6.

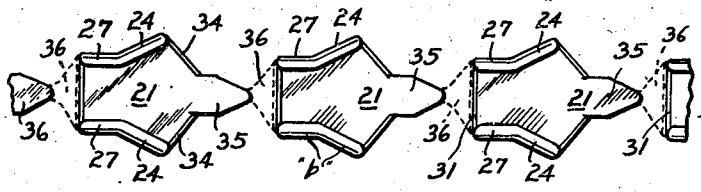

Fig. 7.

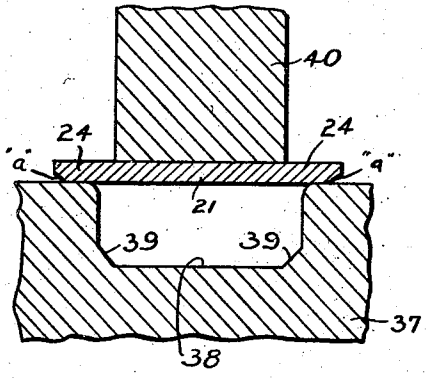

Fig. 8.

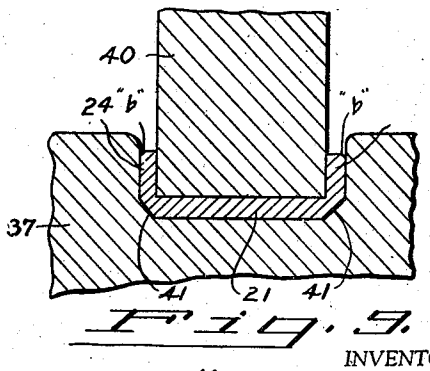

Fig. 9.

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UNITED STATES PATENT OFFICE

2,287,362

SLIDER

Maurice Voity, Long Island City, N. Y., assignor to Universal Slide Fastener Co. Inc., New York, N. Y., a corporation of New York

Application September 16, 1940, Serial No. 356,899

3 Claims. (Cl. 24—205)

The present invention relates to sliders for separable fasteners, and more particularly to such sliders made of sheet material.

Sliders for separable or interlocking fasteners have heretofore been made in various ways. One type was formed of a single piece stamped out of sheet metal. In this type, the stamped-out blank consisted of two portions constituting the front and rear plates of the slider, joined together by a web stamped or coined for reenforcement. In forming the slider the two plate portions were bent towards each other until they were spaced the proper distances apart and riveted or welded, the stamped or coined web becoming a neck holding the front and rear plates in position. It has been found that such construction resulted in the two plates, even though spaced by reenforcing wings, oftentimes not being properly parallel or spaced apart, while the bending operation weakened the neck, and under hard usage the plates were readily twisted out of relationship.

Another type of slider was formed of separate front and rear plates stamped from sheet material by different dies. On the one hand, in earlier times, the plates were spaced by heading a separating rivet, while in later devices the separating rivet or block was welded to the plates. This type of slider entailed the use of different dies for the front and rear plates and the separator head, and bulky in conformation.

In addition to the foregoing disadvantages of the prior art it has been found that during the manufacture of sliders from sheet metal burrs are formed when the blanks are stamped out of the sheet. An additional trimming operation was usually necessary to remove these burrs, adding to the cost of manufacturing the sliders.

It is among the objects of the present invention to provide a slider, the front and rear plates of which are automatically properly spaced during manufacture, and are rigidly connected together so that even under conditions of hard usage they remain properly aligned and spaced.

Another of the objects of the present invention is to provide a novel slider, the front and rear plates of which are similar, being formed from a strip with the same die and operations.

Still a further object of the present invention is to provide a novel slider construction, which is relatively simple and inexpensive.

These and further objects, advantages and capabilities of the present invention will become more apparent from the following description of a preferred embodiment, illustrated in the drawings, in which:

Figure 1 is a perspective view of the slider embodiment.

Figure 2 is a separated view, in perspective, of the front and rear plates of the slider illustrated in Figure 1.

Figure 3 is a plan view of a sheet of material from which the slider is to be formed.

Figure 4 is a plan view of the same sheet after it has been grooved, prior to the die punching operations.

Figure 5 is a section taken through the grooves, taken along the line 5—5 of Figure 4.

Figure 6 is a plan view of the successive slider plate blanks stamped out of the sheet.

Figure 7 is a plan view of the stamped blanks after flanges or guide tracks have been punched therein.

Figures 8 and 9 are sections through a die operating on a plate blank, for forming the flanges therein.

Figure 10 is a plan view of the stamped and punched slider plate blanks in which a pull-tab loop has been formed.

Figure 11 is an enlarged cross-section through a plate taken on the line 11—11 of Figure 10.

Figure 12 is a plan view of the blanks of Figure 10, with the loops swaged to include a rib.

Figure 13 is an enlarged cross-section taken along the line 13—13 through a slider plate of Figure 12.

Referring now to Figures 1 and 2, slider 20 is constructed with a front plate 21 and a rear plate 22 which are similar, and spaced by a predetermined distance. At one end of slider 20 are two diverging outlets 23, 23 arranged between spaced opposed flanges 24, 24 and central formation 25 joining the front and rear plates. Flanges 24 converge towards the rear end 26 of the slider, merging with parallel flanges 27, 27. The opposed edges of flanges 24, 24 are spaced a predetermined distance and arranged to permit the tapes of a separable fastener to readily slip therethrough while the fastener elements are confined within the slider.

An important feature of the present invention is the novel construction of the slide fasteners, permitting rigid assembly of two similar components with predetermined spacing and alignment. Integral triangular tongues or projections 28 and 28' of the respective slider plates 21 and 22 are bent inwardly of the plates, as illustrated in Figure 2. The thickness of triangular portions 28, 28' is the same as that of the slider plates proper. The two slider sections are joined together across triangular portions 28, 28',

preferably by welding. The interior spacing between front and back plates 21 and 22 becomes substantially twice the thickness of the sheet of which the plates are formed defining the required width for accommodating the slide fastener elements. A substantially broad area of joining is apparent for the sliders, effecting a strong and rigid structure capable of substantial service and wear.

The joining of integral triangular projections 28, 28' into central formation 25 effects a pointed internal abutment, particularly useful in disengaging fastener elements in the slider operation, as will be understood by those skilled in the art. Also, no recessed joints are evident on the completed slider, thus presenting an enhanced appearance. A projecting loop 29 for the pull-tab is formed on front plate 21 by incising and raising a narrow strip from the center. A guide rib or web 29' is formed on the underside of the loop. The pull tab (not shown), which is manually grasped to move the slider, is secured to loop 29 and is slidably pivoted and guided thereon in the conventional manner.

In accordance with the present invention, front and rear plates 21, 22 are similarly constructed, except that an additional step is used to form loop 29 in front plate 21. The plates are successively formed in a blank strip 30 of suitable material, illustrated in Figure 3, in which V-shaped grooves, such as shown in Figure 5, are stamped in predetermined shapes for the individual plates. For each slider plate there is a groove 31, transversely of the sheet; two parallel grooves 32 at right angles to the extremities of transverse groove 31; two diverging grooves 33 connecting with grooves 32; and converging grooves 34 connecting with grooves 33. The outer ends of converging grooves 34 are a predetermined distance apart.

The next step in forming the slider plates is the stamping of the blanks to the shape indicated in Figure 6, the cutting being along grooves sets 32, 33, 34. The cutting of grooves 32, 33, 34 is performed at the apex of the respective V-grooves, thereby forming a bevel along the corresponding edges indicated as *a* in Figures 4 and 8. Triangular tongues 35 are arranged between grooves 34 and tailpiece 36 adjacent groove 31 connecting the successive plate formation. Tongues 35 constitute the projections 28, 28' of the slider plates previously described.

The blanks are subjected to a die 40 to form flange sets 24 and 27 heretofore described in connection with Figures 1 and 2. This is accomplished by inverting and placing the stamped blanks of Figure 6 in die 37, 40 as shown in Figure 8. Female die portion 37 has a flat bottom 38, beveled bottom edges 39, and vertical sides. The punch or male die element 40 forces blank 21 into die member 37, as shown in Figure 9, forming angularly directed flanges or tracks 24 leading to straight flanges or tracks 27, and beveled edges 41 at the bottom of the blank. In the coining action of the dies the blank now takes on the appearance illustrated in Figures 7 and 9, wherein the metal displaced in such operation is urged upwardly in reduction of the slope of the bevel from that originally indicated as *a* in Figures 4 and 8 to that indicated as *b* in Figures 7 to 9; the outer surface of tracks or flanges 24 and 27 being maintained in straight and smooth contour as the metal flows upwardly in Figure 9 to form the relatively reduced but nevertheless smooth bevel *b*. The punching or coining, although shown insofar as it relates to one section of a slider in Figure 9, is done for the entire wall or track structure for each slider and may be carried out in multiple for the successive sliders to provide the connected assembly shown in Figure 7.

By virtue of the formation of the beveled edges defined as *a* in Figure 4 and the transposition during the coining operation illustrated in Figure 8 of all the displaced metal in reduction of the beveled edge to the conformation indicated as *b* in Figure 7, there is eliminated any formation of burrs or flash at the edges of the flange or track 24 or 27, since all excess metal is displaced and flows in the reduction of the bevel as indicated. The track or flange structure of the slider, as indicated in Figures 7 and 9, therefore has smooth wall surface formations both interiorly and exteriorly. Although a particular conformation of the chamfer defining the grooves in Figure 4 and the beveled edges of Figure 8 prior to coining is indicated as a preferred embodiment, it is within the province of my invention to vary the contour of the chamfer and the depth of the groove shown in section in Figure 5, so that as the coining operation is carried out in the manner illustrated in Figures 8 and 9, the flow of metal will be along the exterior of the flange or track in extension of the wall surface and reduction of the beveled edge defined by the chamfer.

The individual slider plates 21 (or 22) are separated along the apex of transverse V-groove 31. The tongue 35 is cut off at its triangle apex, while tail-pieces 36 are detached, as indicated by the dotted lines of Figure 7. Projecting tongues 35 are thereupon bent-over inwardly to form the triangular projections 28, 28' of plates 21, 22, as illustrated in Figure 2.

It is to be understood that the front and back slider plates 21 and 22, in accordance with the invention, are constructed with similar operations and the same tools and dies. Only one additional operation is required for completing the front or upper slider plate 21, namely the formation of loop 29. Loop 29 may be added to plates 21 while they are in the successive string formation, corresponding to the showing of Figure 6 or 10; or after separation, corresponding to the assembly shown in Figure 7.

A central punching operation outwardly of plate 21 causes loop 29 to project on the front side. Figures 10 and 11 illustrate the result of such operation. The inner edges of loop 29 are then swaged at 42, 42 to form inner central rib 29' shown in cross-sectional Figure 13. Ribs 29' and swaged edges 42, 42 may also be seen in the partially formed slider plates 21 of Figure 12. The severing of tail-pieces 36 to complete the individual sliders is as previously described in connection with Figure 7.

The slider construction is completed by arranging tongue 28 of one front plate 21 and tongue 28' of one rear plate as against each other, as indicated in Figure 2 and shown in Figure 1. The tongues 28, 28' are thereupon welded or otherwise suitably fastened together. The thickness of tongues 28, 28' determine the spacing of the plates, designed so that fastener elements will readily pass between them. The height of the flanges 24 is predetermined to allow for the passage of the separable tapes between the opposed edges of the flanges, being somewhat less than the thickness of either tongue 28, or 28'.

While I have illustrated and described details

of a preferred embodiment of my invention, it is to be understood that changes and modifications may be made to its details of construction without departing from the general spirit and scope of the invention as set forth in the appended claims.

I claim:

1. A slider for separable fasteners comprising separate front and rear plates, each having perpendicularly-directed guide tracks, an inwardly bent triangular tongue integral with and projecting from an end of each of said plates disposed in parallelism with and extending against its corresponding plate with the apex of each tongue triangle directed longitudinally of the slider, said plates and tongues being symmetrically juxtaposed and the respective tongues secured to each other to rigidly space and hold said plates relative to each other.

2. A slider for separable fasteners comprising separate front and rear plates of sheet material, each having perpendicularly-directed guide tracks, an inwardly bent tongue integral with each of said plates, each said tongue being of the same thickness as the plate sheet material and disposed in parallelism with and extending against its corresponding plate, said tongues being secured to each other for predeterminedly spacing and holding said plates relative to each other, said guide tracks being less in height than the tongue thickness whereby the opposed ends of the flanges are spaced from each other.

3. A slider for separable fasteners comprising separate front and rear plates of sheet material, each having perpendicularly-directed guide tracks, an inwardly bent substantially triangular tongue integral with and projecting from an end of each of said plates, each said tongue being of the same thickness as the plate sheet material and disposed in parallelism with and extending against its corresponding plate with the apex of each tongue triangle directed longitudinally of the slider, said plates and tongues being symmetrically arranged against and secured to each other across the tongues thereof to predeterminedly space and hold said plates relative to each other, said guide tracks being less in height than the tongue thickness whereby the opposed ends of the flanges are spaced from each other.

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