

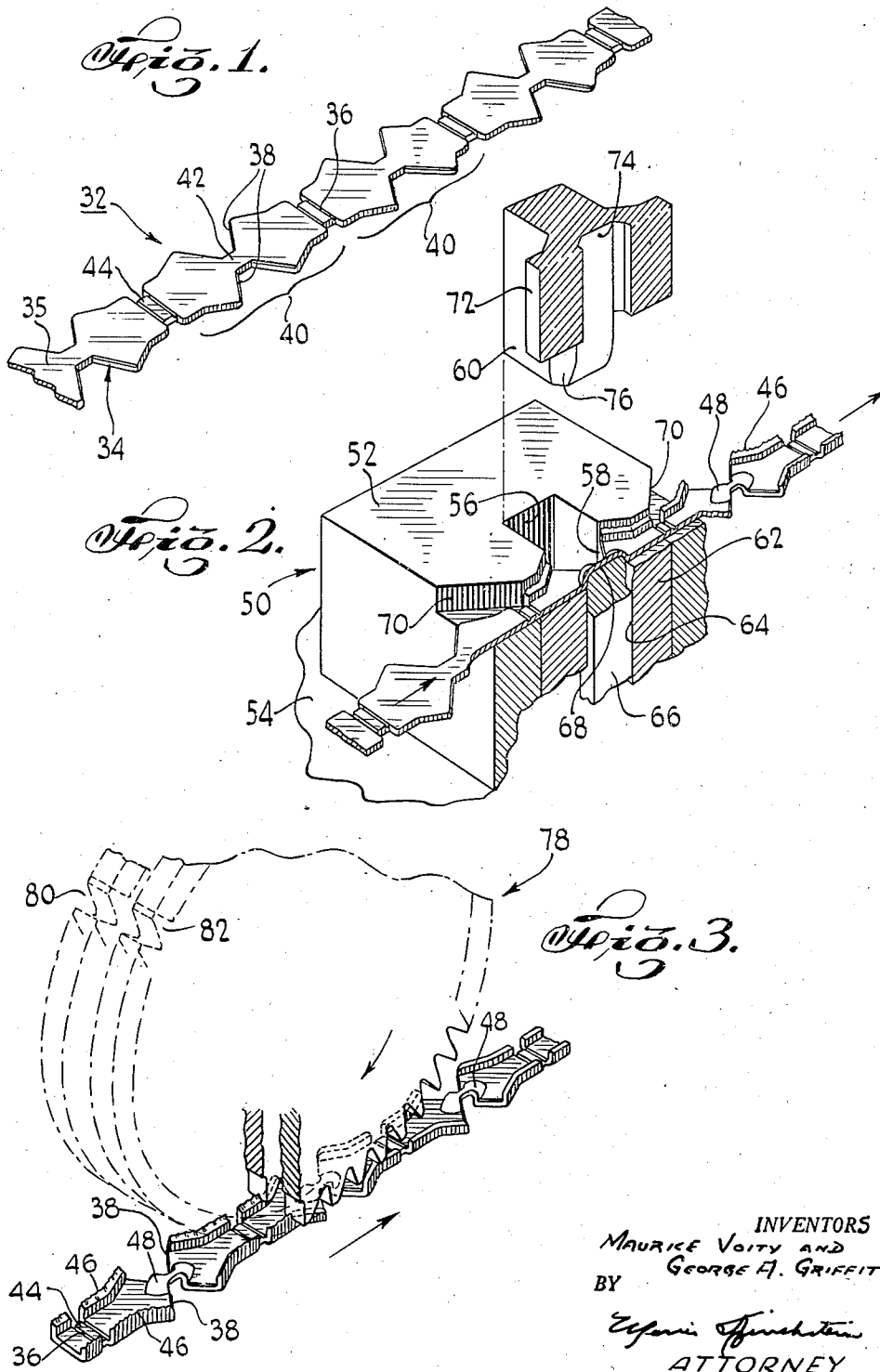
Oct. 22, 1946.

M. VOITY ET AL

2,409,966

BLANK FOR USE IN THE MANUFACTURE OF SLIDERS FOR SLIDE FASTENERS

Original Filed Jan. 14, 1942 2 Sheets-Sheet 1



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Fig. 4.

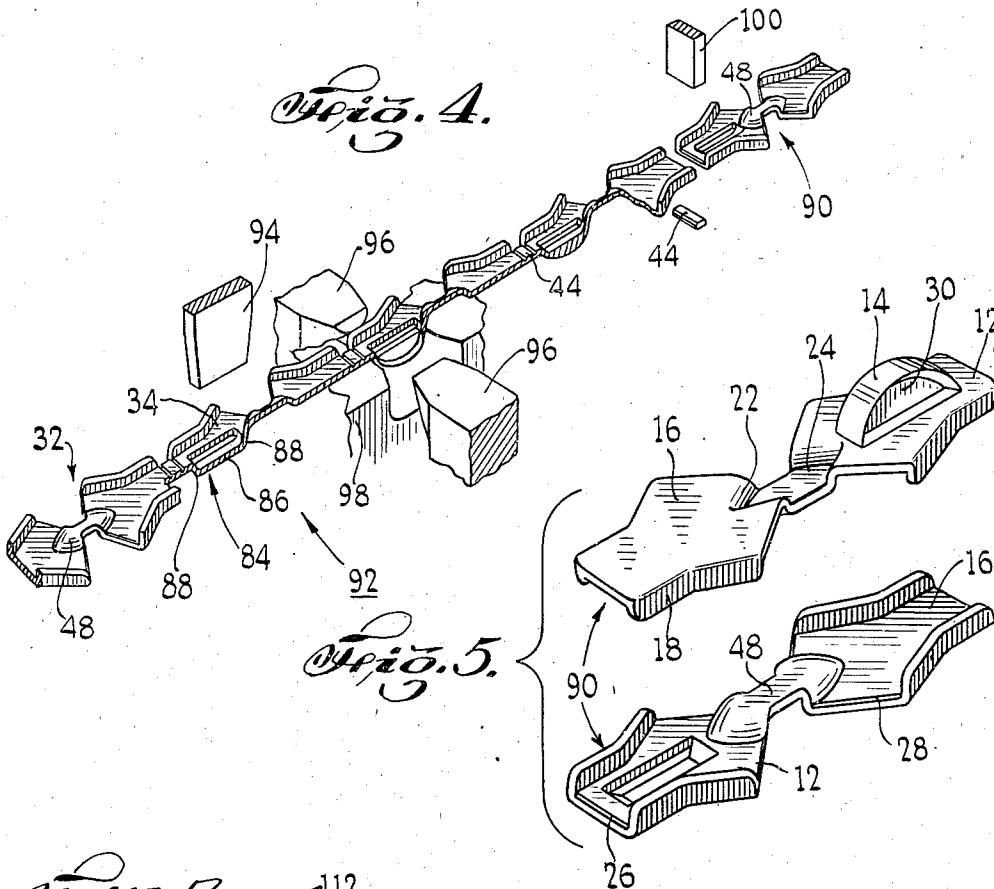


Fig. 5.

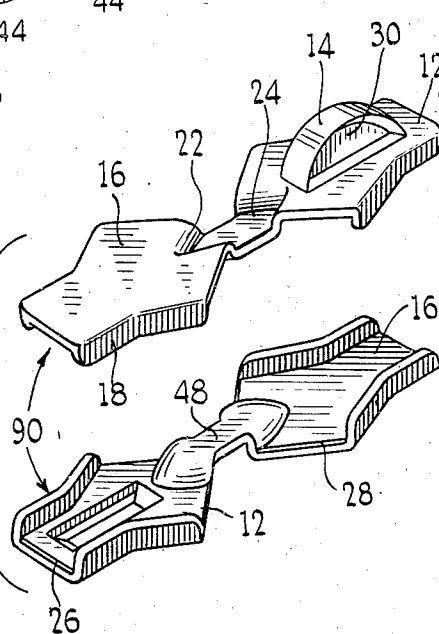


Fig. 7.

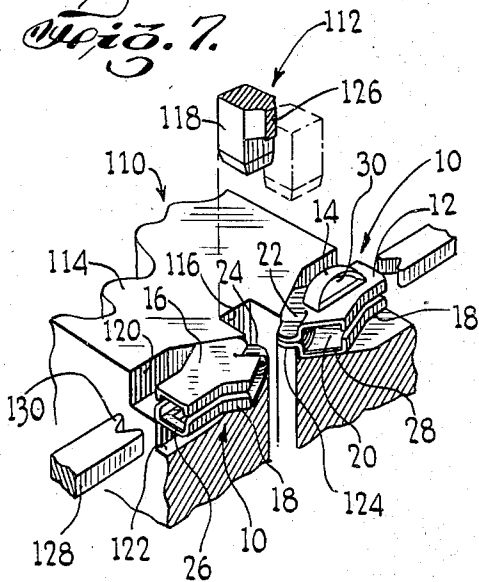
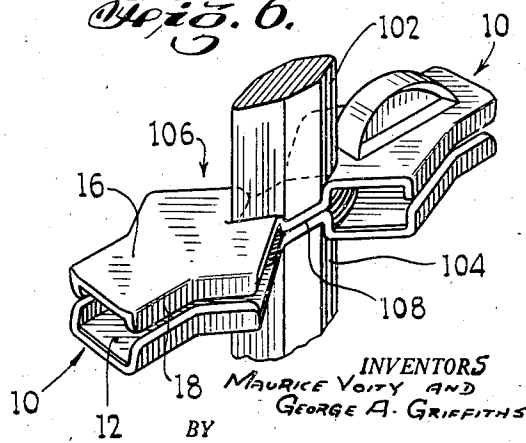


Fig. 6.



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2,409,966

BLANK FOR USE IN THE MANUFACTURE OF
SLIDERS FOR SLIDE FASTENERS

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Original application January 14, 1942, Serial No.
426,694, now Patent No. 2,384,144, dated Sep-
tember 4, 1945. Divided and this application
June 1, 1945, Serial No. 597,110

2 Claims. (Cl. 29—190)

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This invention relates to a blank for use in the manufacture of sliders for slide fasteners.

It has been the practice heretofore to perform some or all of the operations incident to the manufacture of sliders upon individual sliders or slider wing blanks. Due to the fact that the parts on which the operations are performed are very small in dimension and large in number, such methods have had the disadvantage of having relatively slow manufacturing speeds and high manufacturing costs.

It is a principal object of our invention to overcome these disadvantages by providing a slider blank of such nature that up to the time that a slider is completely fashioned and ready for use, it is integrally connected to at least one other similar slider, whereby sliders are never individually manipulated in the manufacture thereof.

In this connection, a more specific object of our invention is to provide a slider blank comprising two pairs of slider wings, the wings in each pair being integrally connected and handled together during all fabricating operations incident to their formation, and the pairs of wings being interconnected at a stage of the slider fabrication to form a slider blank essentially consisting of a pair of integrally connected but otherwise finished sliders so that up to the time the sliders are completely fashioned they still can be handled and worked jointly.

Other objects of this invention will, in part, be obvious and, in part, hereinafter pointed out.

The invention accordingly consists in the features of construction, combinations of elements, and arrangement of parts which will be exemplified in the construction hereinafter described, and of which the scope of application will be indicated in the claims.

Certain features of our invention herein shown and described, but not claimed, are more fully shown, described and claimed in our following applications: application Serial No. 426,694 (issued September 4, 1945, as U. S. Letters Patent 2,384,144) for Method and means for making sliders for slide fasteners, filed January 14, 1942, of which the present application is a division; application Serial No. 446,062 (issued September 4, 1945, as U. S. Letters Patent 2,383,999) for Method and means for making sliders for slide fasteners, filed June 6, 1942, which is a continuation-in-part of application Serial No. 426,694; application Serial No. 446,063 (issued September 4, 1945, as U. S. Letters Patent 2,384,145) for Method and means for making sliders for slide fasteners, filed June 6, 1942, which is a con-

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tinuation-in-part of our application Serial No. 426,694; and application Serial No. 490,406 for Method and means for making sliders for slide fasteners, filed June 11, 1943, which is a division of application Serial No. 426,694.

In the accompanying drawings in which is shown one of the various possible embodiments of this invention and wherein like numbers refer to like parts throughout,

Fig. 1 is a perspective view of a strip comprising a series of integrally connected slider wing blanks;

Fig. 2 is a schematic perspective view in section of the dies employed to form rails and attaching portions on slider wing blanks, the same being illustrated at the beginning of a forming stroke;

Fig. 3 is a schematic perspective view of a milling device employed to trim rails on the slider wing blanks;

Fig. 4 is a schematic perspective view in partial section of an apparatus for shearing bail lugs and indenting lugs in slider wing blanks and for cutting off pairs of connected fully fashioned slider wings;

Fig. 5 shows top and bottom perspective views of pairs of connected, fully fashioned slider wings;

Fig. 6 is a perspective view of a slider blank together with welding electrodes employed in the formation thereof; and

Fig. 7 is a schematic perspective view in section of the dies employed to separate and size connected pairs of sliders in a slider blank.

Referring now to the drawings, and more particularly to Fig. 7, a slider 10 constructed in accordance with our invention comprises an upper wing 12 from which a bail 14 projects and a lower wing 16. Rails 18 run along the lateral edges of the slider wings. Between the diverging channels 20, the material of each slider wing is directed downwardly to form a substantially V-shaped vertical wall 22 which serves to define the engagement cam employed in all sliders of this type. Flat platforms 24 disposed at the base of the walls 22 serve as attaching portions which, when welded together, join the upper and lower wings 12 and 16 of the slider and function as a neck.

Various details may be incorporated in the slider to enhance its appearance, reinforce its structure and provide a smooth sliding action. For example, the edges 26 of the entering channel and the edges 28 of the diverging channels 20 may be beveled. The outer ends of the platforms

24 may project beyond the extreme ends of the diverging channels 20 and may be smoothly rounded off. A web 30 may be indented from material of the bail 14, said web being disposed medially and longitudinally of the bail.

To make the sliders 10, a long strip of sheet metal of suitable composition is first blanked out, for example, in a reciprocating press, to form a strip 32 (Fig. 1) comprising a series of integrally connected slide fastener wing blanks 34. The shape of these blanks is governed in general by the outline of the wings in the slider ultimately to be produced.

In the preferred form of our invention illustrated herein, the slider wing blanks 34 are similar in shape to the slider wings 12 and 16, but are slightly broader in order to provide material for the rails 18. Each blank 34 is also provided with material 35 from which the neck and attaching portion, including the walls 22 and platform 24, can be shaped. If desired, during the blanking operation bevels 36 and 38 may be formed on the edges of the slider blank which will subsequently form the inclined edges 26 and 28 of the entering and diverging channels.

The slider wing blanks 34 are disposed longitudinally of the strip 32 in pairs 40, the blanks in each pair being integrally connected by a link 42 which, during a subsequent stage of operation, will be completely sheared away. Although for convenience of handling, the individual slider wing blanks 34 in a pair of such connected blanks may be disposed in any desired position, we preferably connect the portions 35 of the wing blanks by the links 42 in order to facilitate the attaching operation hereinafter described.

In addition to the link 42 integrally connecting the wing blanks 34 in a pair 40, there is also provided a link 44 for integrally connecting successive pairs of wing blanks so as to form the elongated strip 32. It should be noted that both the links 42 and 44 are fully severed from the strip 32 during subsequent operations in the formation of the separate slider wings and sliders, and that therefore these links may be caused to assume any desired shape, or may be omitted altogether, and in which latter case the slider wing blanks 34 will be directly integrally connected to each other.

After the strip 32 of wing blanks 34 has been made, the rails 18 are formed in a drawing operation, such as illustrated in Fig. 1. This operation, as well as all subsequent operations, is preferably simultaneously performed on each wing blank of a pair 40 of such blanks. The height of the rails 18 thus formed may be made greater than desired in the finished slider 10, no attempt being exerted to control the shape of the upper rail surface. Due to drawing this upper rail surface is considerably roughened along the outer edge thereof, as shown at 46. At the same time the rails are drawn, elongated diamond shaped projections 48 are fashioned from the material 35 of the wing blanks and from the links 42. Each end of an elongated diamond 48 is disposed in a different embryonic wing blank 34, and said ends form the V-shaped walls 22 and platforms 24.

Any suitable mechanism, as for example, the apparatus 50, may be used to carry out the drawing operation. Said apparatus comprises a lower stationary die block 52 mounted upon a bed plate 54. The central portion of said die block is cut away to provide a pair of opposed rectangular recesses 56 whose corners near the center of the

die block are cut away as at 58 to conform exactly to the shape of the edges 38 on the strip 32. Pilot posts 60 carried by a reciprocating head (not shown) cooperate with the said recesses 56 to insure proper registration of the pair 40 of wing blanks being worked in the apparatus 50.

Slidably mounted in the die block 52 intermediate the recesses 56 is a pad 62 centrally apertured at 64. The die block 52 is recessed from the top face to the bottom face thereof, to receive said sliding pad 62. This pad conforms in shape to the plan profile of a pair of slider wings 12 and 16 having a link 42 connecting the same between their diverging channel portions. The shape of the central aperture 64 in the pad conforms to the plan profile of the diamond shaped projection 48.

Slidably and snugly received in said aperture 64 is a post 66, whose upper surface 68 is of the same shape as the outer surface of the diamond shaped projection 48. Said post is fixedly mounted in the bed plate 54 by suitable means (not shown) and is, therefore, stationary with respect to the die block 52, but movable relative to the pad 62. A resilient block (not shown) is provided to bias the pad 62 upwardly.

Cut-outs 70 may be provided on opposite sides of the block 52 to freely receive the portions of the strip 32 not being worked upon when said strip is depressed during drawing of the rails 18. A punch 72, carried on the same movable reciprocating head as the pilot posts 60, is formed with a cross-section similar to the pad 62, but is slightly narrower to accommodate the rails between said punch and the walls of the aperture in which the pad 62 slides. An aperture 74 is vertically disposed in the center of the punch 72 to receive the elongated diamond shaped projection 48 when said punch moves down over the post 66. The aperture 74 is larger than the post 66, in order to accommodate the walls of the projection 48.

Suitable feeding means (not shown) is provided to intermittently advance the strip 32 between strokes of the punch 72. Since feeding mechanisms common to the art are not accurate in their movement, we may bevel off the lower edges 76 of the pilot posts 60 in order to exactly position the strip 32 prior to the rail drawing operation. When the strip is advanced, it preferably lies on the upper surface of the die block 52 and may be guided in such position by a combined guide and stripper plate (not shown).

Next, the rough edges 46 are trimmed off to reduce the rails 18 to their ultimate predetermined height. This operation may be performed in a machine 78 comprising a pair of spaced parallel milling cutters 80, 82 which are rotated at a high speed to cleanly remove the extra rail material and leave no jagged edges which require further finishing.

In the next operation, each alternate wing blank is provided, by a shearing operation (Fig. 4), with a lug 84 whose central portion 86 is free of the slider wing blank from which it projects. The ends 88 of the lug are integrally connected with the said wing blank. Portions of the central parts 86 of the lugs are thereupon indented to provide the web 30. Prior to and during the indenting operation, the slider wing blank 34 on which the lug 84 is positioned, may be firmly gripped on its upper and lower surfaces, and die means additionally may be employed to limit the movement of the said central portion 86 during indentation and web forming.

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Subsequent to formation of the web, we shear off sets or pairs 90 of now completed slider wings. Each of said pairs includes one finished slider wing 12 having a bail projecting therefrom and one finished slider wing 16 without a bail. At this time the said pairs 90 have the appearance shown in Fig. 5. It should be noted that the two connected finished slider wings of any pair 90 of such wings are not used together to make a slider 10, but that each wing in said pair will be used with a wing from another pair to form a slider.

The lug forming, indenting and shearing operations may be carried out by an apparatus 92 comprising a stationary bed, a reciprocating head, and an intermittent feeding means for the strip 32 (all not shown). Said head carries a punch 94 for shearing out the lug 84. The head also carries means for moving a pair of indenting dies 96 toward a lug 84 which has been previously sheared out by the punch 94. A die block 98 cooperating with the indenting dies 96 limits downward movement of the central portion 86 of the lug and causes the bail 14 formed by said dies to assume the desired configuration. The reciprocating head also carries a shearing punch 100 which cooperates with a stationary anvil (not shown) on the bed to successively cut off pairs 90 of the finished slider wings from the end of the strip 32.

It may be pointed out here that the blanking, rail and diamond forming, rail trimming, and bail forming operations may be performed as a continuous process on a strip from which the pairs 90 are finally sheared or they may be separately performed upon a strip which is reeled up after each operation.

The pairs 90 of connected finished slider wings are arranged in groups of two, as illustrated in Fig. 5, with the rails facing each other and the diamond shaped projections 43 in registration. Said diamond shaped projections then are abutted and welded together (Fig. 6). It is particularly pointed out that by disposing the attaching portions 35 of the wing blanks 34 in proximity, we are able in a single welding operation involving only one pair of electrodes to simultaneously weld together four slider wings and form a slider blank 106 comprising two integrally connected fully fashioned sliders.

The welding apparatus is schematically indicated in Fig. 6 and may be of any form suitable for the purpose.

As illustrated, said apparatus comprises a pair of spot welding electrodes 102, 104 and holding means (not shown) to position two pairs 90 of finished slider wings in the manner shown in said figure; that is, with the rails 18 facing each other and with an upper wing 16 not having a bail facing a lower wing 12 with a bail.

The welding operation results in the formation of what is herein referred to as a blank 106 for use in manufacturing sliders for slide fasteners, more briefly called a "slider blank," and is to be distinguished from the slider wing blanks 34 hereinbefore referred to or from the pairs 90 of completely finished wings. Said slider blank, as clearly shown, comprises two pairs of spaced parallel completely fashioned slider wings, each integrally connected by a neck, the necks themselves being integrally connected, whereby to form two sliders 10 joined by a piece 108 of material comprising a pair of links 42.

During the welding operation the slider wings forming part of the slider blank 106 may be slightly angularly moved out of parallelism. To

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correct this, and to sever the connected pair of sliders 10 in such a slider blank 106 from each other, said slider blank is cut in half (Fig. 7) and, optionally, at the same time sized, whereby to dispose the slider wings 12 and 16 in parallel, properly spaced relationship, and to align the rails 18.

The severing and sizing operations may be carried out in an apparatus 110. Said apparatus comprises a reciprocating head (not shown) which carries a punch 112 and a stationary bed plate (not shown) on which a die block 114 is mounted. Said block has a rectangular recess 116 which slidably receives a pair of pilot posts 118 integral with the punch 112 to accurately position the slider blank 106 prior to separating the pair of sliders 10 in said blank.

Disposed on each side of the recess 116 are a pair of cut-outs 120 in which the slider blank 106 is positioned. The walls of the cut-outs which lead toward the recess 116 are angularly inclined to conform to the angle of the slider wings defining the diverging channels 20. The cut-outs are made deep enough to substantially fully receive the slider blanks 106. Elongated narrow grooves 122 are formed in each of the cut-outs 120 to receive the bails 14. A finger 124 projects into the recess 116 from each one of the cut-outs 120 to provide an anvil cooperating with the operative portion 126 of the punch 112. Said portion 126 is concavely shaped, as illustrated, to conform to the desired outline of the free end of the platform 24.

While the punch 112 is descending, sizing plates 128 are moved inwardly into the entrance channel of each of the sliders 10. Said plates may be actuated from the reciprocating head of the apparatus 110 by any suitable means. The ends of the plates 128 are bifurcated to form diverging fingers 130 shaped to the desired inner contour of a portion of the diverging channels 20.

When the head which carries the punch 112 has fully descended, it will clamp the pair of sliders 10 which have been severed from each other between the said head and the die block 114, with the fingers 128 disposed inside of the slider and thus accurately size the sliders to their desired ultimate shape with the wings parallel and the proper distance apart, and the wings and rails in alignment. While this sizing operation is of aid in bringing the slider to its final correct size and shape, the slider has nevertheless already been completely fashioned, and said sizing operation is not embraced within the term "forming" as used herein.

It will thus be seen that we have provided a slider blank and method for making and using the same, pursuant to which the several objects of this invention are achieved, and which is well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiment above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

Having thus described our invention, we claim as new and desire to secure by Letters Patent:

1. A slider blank comprising two pairs of spaced parallel completely fashioned slider wings, each wing having a plane body portion with rails running along its lateral edges and extending away from the plane of said body portion, and each wing having an attaching portion raised above

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said body portion and extending in the same direction as said rails, each attaching portion lying immediately adjacent and being integrally connected to the other attaching portion of the same pair, the attaching portions of one of said pairs being integrally connected to the attaching portions of the other of said pairs, the wings and attaching portions being in alignment and the rails being opposed.

2. A slider blank comprising two pairs of spaced parallel completely fashioned slider wings, each wing having a plane body portion with rails running along its lateral edges and extending away

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from the plane of said body portion and each wing having an attaching portion raised above said body portion and extending in the same direction as said rails, each attaching portion lying immediately adjacent and being integrally connected to the other attaching portion of the same pair by a link, the attaching portions of one of said pairs being integrally connected to the attaching portions of the other of said pairs, the wings and attaching portions being in alignment and the rails being opposed.

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