

Description

This invention generally relates to a slide fastener finishing machine which is adapted to finish a slide fastener by manually assembling a slider and a bottom stop to slide fastener chains sewn on clothing—for example trousers' fly—or slide fastener chains not secured to any support member. More specifically this invention relates to a slide fastener finishing machine comprising an upper frame, a bottom stop fastening head mounted on said upper frame for vertical movement and having a punch, a lower frame, a slider holding jig fixedly secured to said lower frame and offset from the position right below said punch toward the side facing the operator, and a die holder mounted on said lower frame between said position right below the punch and said slider holding jig, said die holder having a die on the top thereof and being movable between a first position in which said die is aligned with said punch and a second position in which the die is offset from the punch.

A slide fastener finishing machine of the aforementioned type is known from GB—A—809 333. In performing a slide fastener finishing operation with such a finishing machine, the slider is held at the upper end of the slider holding jig in such a manner that the throats of the slider direct to the operator. The operator then grips the fastener chains at the leading ends by the finger tips of both hands and pulls the chains through the slider. As the fastener chains are threaded through the slider, the chains mesh with each other. The chains are advanced until the leading end portions of the fastener chains pass over the die on the die holder. As the fastener chains are further advanced the operator moves the die holder forwardly toward the bottom stop fastening head until the die holder is positioned just below the punch. When the particular portion of the fastener chains to which the bottom stop to be fastened is positioned just below the punch the latter is lowered. By this, bottom stop is fastened to the fastener chains to thereby complete the slide fastener finishing operation.

This prior art machine is disadvantageous however in that the movement of the die holder towards the bottom stop fastening head is difficult because the operator needs both his hands to pull the fastener chains forwardly. Another drawback resides in the fact that it is difficult to observe a well-defined distance between the leading ends of the two fastener chains and the die, while this is the precondition for the bottom end stop to have a defined distance from the leading ends of the fastener chains.

It is an object of the invention to improve the slide fastener finishing machine of the type mentioned above in a manner to ensure—with simple constructional means—that the leading ends of the stringers are located at a predetermined distance in front of the die of the die

holder when the latter is disposed just below the punch.

A slide fastener finishing machine satisfying these requirements is characterized in the appended claim 1.

The advantageous effect of the invention resides in the fact that the die holder starts its forward movement automatically at the very moment when the operator's fingers—which hold the leading ends of the fastener chains—contact the pusher plates. But this means at the same time that the operator's fingers and thus the leading ends of the two fastener chains take a predetermined relative position in respect to the die of the die holder. In other words, it is safeguarded that the die is located, at a predetermined distance, behind the leading ends of the fastener chains. Due to the adjustable mounting of the pusher plates on the die holder it is possible to vary the relative position of the operator's fingers—and thus of the leading ends of the fastener chains—in respect to the die, so that the bottom stops may be attached at a defined distance behind the leading end of the fastener chains.

In a preferred embodiment of the invention each of said pusher plates is provided with a mounting plate having a pair of upper and lower parallel slots extending in the direction of movement of the die holder, and said die holder is provided on opposite sides thereof with two clamping bolts extending through the corresponding upper and lower slots. These means allow for a simple adjustment of the pusher plates with respect to the die holder.

The above and other objects and attendant advantages of the present invention will be readily apparent to those skilled in the art from a reading of the following detailed description in conjunction with the accompanying drawings which show preferred embodiments of the present invention for illustration purpose only, but not for limiting the scope of the same in any way.

Fig. 1 is a fragmentary side elevational view in partial section of one preferred embodiment of the slide fastener finishing machine constructed in accordance with the present invention;

Fig. 2 is a fragmentary front elevational view of said machine as shown in Fig. 1 showing the relationship between the holder and the bottom stop fastening head;

Fig. 3 is a plan view showing the manner in which the fastener chains are threaded through the slider in the machine of the invention;

Fig. 4 is a plan view showing the manner in which a bottom stop is fastened to the fastener chains;

Fig. 5 is a fragmentary side elevational view of another embodiment of the slide fastener finishing machine of the present invention; and

Fig. 6 is a cross-sectional view taken substantially along the line A—A and as seen in the arrow direction in Fig. 5.



The present invention will be now described referring to the accompanying drawings and more particularly, to Fig. 1 thereof in which one embodiment of the slide fastener finishing machine of the invention is generally shown. As shown in Fig. 1, a vertically extending upper frame 1 has a bottom stop fastening head 4 mounted thereon and the head includes a vertically movable punch 2 and a vertically movable pocket 3 which houses the punch 2 therein for vertical movement. A horizontally extending lower frame 5 is formed at the outer end portion (the right-hand end portion as seen in Fig. 1) as having a U-shape when viewed horizontally and a slider holding jig 6 is uprightly secured between and to the opposite legs of the U-shape at the outer end of the lower frame 5 which position is offset from right below the head. A holder 9 including a die 8 at the upper end is pivoted to a stub shaft 7, which is provided between and to the opposite legs of the U-shape of the lower frame 5 right below the head 4, for pivotal movement between the retracted position in which the die 8 of the holder 9 is positioned in a position right below the bottom stop fastening head 4 and the advanced position in which the die 8 of the holder 9 is positioned offset from the head 4. In the illustrated embodiment in Fig. 1, although the holder 9 is pivoted to the lower frame 5, the holder may be slid linearly along the opposite legs of the U-shaped outer end of the lower frame 5 as will be described hereinafter.

Furthermore, as more clearly shown in Figs. 1 and 2, a pair of pusher plates 10, 10 are secured to the opposite sides of the holder 9 and project like a wing whereby when the pusher plates 10, 10 are manually pushed in the forward direction or away from the jig 6, the holder 9 is advanced so as to position the die 8 in a position right below the punch 2. In order to retract the holder 9, a pusher pin 12 is received in a cylinder formed at the upper end portion of the lower frame 5 and biased under the force of a spring 11 which is also received in the cylinder in contact with the inner end of the pusher pin 12 so that the pusher pin normally abuts against the holder 9 to urge the holder 9 towards the jig 6. In order to limit the rocking movement of the holder 9 between the advanced and retracted positions, advance and retract stops 13, 14 which are finely adjustable are provided on the lower frame 5.

Although only one pusher plate 10 may be provided projecting from either side of the holder 9, it is preferable to provide the pair of pusher plates 10, 10. And according to the present invention, the position of the pusher plates 10, 10 is adjustable with respect to the holder 9. For this purpose, the holder 9 is provided in the mounting plates 10a, 10a on the opposite sides thereof with a pair of upper and lower parallel and spaced slots 15, 15 and bolts 16, 16 adjustably hold the pusher plates 10, 10 in position.

When the die 8 is aligned with the punch 2, an instruction is given to the machine for performing the bottom stop fastening operation. Although such an instruction can be given by a foot switch, for example, in the illustrated embodiment, the means in the form of a limit switch 17 is mounted on the lower frame 5 and actuated by a dog 18 mounted on the holder 9. Fitted on the lower frame 5 is a shield cover 19 which covers the lower portion of the lower frame.

The bottom stop fastening head 4 includes the pocket 3 for receiving a bottom stop 35 therein which is successively fed by a through structure 20 and the punch 2 which is movable up and down within the pocket 3. At first, both the pocket 3 and the punch 2 are moved downwardly until the bottom of the pocket 3 abuts against the slide fastener chain 30 on the die 8, whereupon the pocket ceases its downward movement and is caused to open laterally to release the bottom stop while the punch 4 continues to move downwardly to strike against one of the bottom stop 35 whereby the bottom stop is secured in the fastener chain. In Fig. 1, reference numeral 21 denotes a safety cover secured to the upper frame 1.

The slider holding jig 6 is formed at the upper end with a concaved recess 22 for receiving a slider 31 in a stabilized position with the pull tab attachment side of the slider being disposed on the top. The slider holding jig 6 is further formed with a vertical pull tab insertion groove 23 in communication with and extending downwardly from the recess 22 for receiving the pull tab 33 of the slider 31. The slider holding jig 6 is further formed with a horizontal slot 23a which communicates with the vertical groove 23 in an intermediate point between the upper and lower ends of the latter. A ball 24 is received in the slot 23a to be forced into the window 34 in the pull tab 33 under the force provided by a spring (not shown) or an air cylinder 25 through a lever 26. In order that the force applied to the ball 24 to force the ball into the pull tab window 34 is generated only when the pull tab 23 is inserted into the pull tab insertion groove 23, a sensor rod 27 extends upwardly through a vertical opening 23b in the jig 6 and is biased upwardly toward the groove 23 under the force of a spring 28. A selector valve 29 is mounted in the jig 6 below the lower end of the sensor rod 27 to control the operation of the air cylinder 25. Thus, when the sensor rod 27 is moved downwardly by pulling the pull tab 33, air under pressure is supplied through the selector valve 29 into the air cylinder 25 which in turn applies a force to the ball 24. However, the slider holding jig 6 is not limited to the illustrated construction, but may have any other suitable construction.

Next, a modified embodiment of the invention having a means adapted to move the die holder 9 slidably will be now described referring to Figs. 5 and 6. Namely, a pair of guide

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rods 36, 36 are provided in the bifurcated end of the lower frame 5 extending in parallel to each other and the holder 9 having the die 8 is mounted on the guide rods 36 with slide bearings 37, 37 interposed therebetween for slidable movement along the rods. As in the first embodiment, the reciprocal movement of the die holder 9 is limited by the advance stopper 13 and retraction stopper 14 like in the first embodiment. Furthermore, the slider holding jig 6 is pivotally mounted at the extreme outer end of the lower frame 5 and the holder 9 is normally urged outwardly by means of the springs 11, 11 as in the first embodiment.

With the above-mentioned construction and arrangement of the slide fastener finishing machine of the present invention, when the slide fastener finishing machine of the invention is operated for performing the finishing work on the fastener chains 30 (which are attached to a clothing 36' such as the trousers' fly in the illustrated embodiment), first of all, the slider 31 is held in the concaved recess 22 at the upper end of the jig 6 in such a manner that the throats 32, 32 of the slider 31 direct to the operator i.e., opposite from the bottom stop fastening head 4 as seen in Fig. 3. The operator then grips the fastener chains 30 at its leading end by the finger tips of both hands and pulls the chains apart from each other as shown in Fig. 3. Thereafter, the fastener chains 30 are threaded through the slider 31 maintaining their parallel relationship. As the fastener chains 30 are threaded through the slider 31, the chains 30 mesh with each other. The chains are advanced until the leading end portions of the fastener chains 30 are positioned just below the bottom stop fastening head 4. As the fastener chains 30 are advanced in this manner, the fastener chains 30 pass over the die 8 on the holder 9 and the operator's fingers engage the pusher plates 10. As the fastener chains 30 are further advanced, the operator's fingers push the pusher plates 10 forwardly or leftwards as seen in Fig. 1 until the holder 9 is positioned just below the bottom stop fastening head 4. When the particular portion of the fastener chains 30 to which the bottom stop 35 to be fastened is positioned just below the punch 2, this is sensed by the limit switch 17 and the punch 2 and the pocket 3 are lowered. By this, bottom stop 35 is fastened to the fastener chains 30 to thereby complete the slide fastener finishing operation. At the end of the finishing operation on the slide fastener, when the fastener chains 30 are taken out of the machine, the slider 31 is also removed from the jig 6. At this time, since the holder 9 is biased rightwards by the spring 11, when the finger force applied by the operator is removed from the holder, the holder 9 automatically assumes the initial position as shown by the solid line in Fig. 1 whereby the machine is ready for the next finishing operation. The operation of the modified embodiment in which the holder 9 is adap-

ted to slide linearly is similar to that of the first embodiment.

As is clear from the foregoing description, according to the present invention, since the slider holding jig is positioned remote from the punch closer to the operator, the die holder is positioned between the position just below the punch and the slider toward the position just below the punch holding jig and is movable and the pusher plates are secured to and project from the die holder, while the fastener chains are manually fed to the position just below the punch where the fastener chains are threaded through the slider to mesh with each other and the chains are further moved toward the position just below the punch together with the die while maintaining the particular portion of the fastener chains to which the bottom stop is to be fastened in position on the die. Thus, since the fastener chains are fed only in one direction and the die is also moved to the position just below the punch together with the chains, it is not necessary to change the manner of gripping the chains while they are fed and the fastener chains are finished by only a simple feeding operation. By this, operation efficiency of fastener chain finishing is greatly improved and the bottom stop is fastened to the predetermined position safely and positively.

List of reference numerals

- 1 =upper frame
- 2 =punch
- 3 =pocket
- 4 =head
- 5 =lower frame
- 6 =slider holding jig
- 7 =stub shaft
- 8 =die
- 9 =holder
- 10 =pusher plate
- 10a=mounting plate
- 11 =spring
- 12 =pusher pin
- 13 =stopper
- 14 =stopper
- 15 =slot
- 16 =bolt
- 17 =limit switch
- 18 =dog
- 19 =shield cover
- 20 =structure
- 21 =safety cover
- 22 =concave recess
- 23 =groove
- 23a=slot
- 24 =ball
- 25 =air cylinder
- 26 =lever
- 27 =sensor rod
- 28 =spring
- 29 =selector valve
- 30 =slide fastener chain
- 31 =slider

- 32 =throat
 33 =pull tab
 34 =window
 35 =bottom stop
 36 =guide rod
 36' =clothing
 37 =slide bearing

Claims

1. A slide fastener finishing machine comprising an upper frame (1), a bottom stop fastening head (4) mounted on said upper frame (1) for vertical movement and having a punch (2), a lower frame (5), a slider holding jig (6) fixedly secured to said lower frame (5) and offset from the position right below said punch (2) toward the side facing the operator, and a die holder (9) mounted on said lower frame (5) between said position right below the punch (2) and said slider holding jig (6), said die holder (9) having a die (8) on the top thereof and being movable between a first position in which said die (8) is aligned with said punch (2) and a second position in which the die (8) is offset from the punch (2), characterized in that a pair of pusher plates (10, 10) are provided on opposite sides of the die holder (9) and project like a wing whereby when the pusher plates (10, 10) are manually pushed away from the jig (6) by the operator's fingers gripping the fastener chains (30), the die holder (9) is advanced so as to position the die (8) in a position right below the punch (2), said pusher plates (10, 10) being adjustably secured to said die holder (9) so that the distance between the pusher plates (10, 10) and the die (8) of the die holder (9) is adjustable.

2. The slide fastener finishing machine as set forth in claim 1 in which each of said pusher plates (10) is provided with a mounting plate (10a) having a pair of upper and lower parallel slots (15, 15) extending in the direction of movement of the die holder (9), and in that said die holder (9) is provided on opposite sides thereof with two clamping bolts (16, 16) extending through the corresponding upper and lower slots (15, 15).

Patentansprüche

1. Vorrichtung zur Fertigstellung von Reißverschlüssen, bestehend aus einem oberen Rahmen (1), einem zum Anbringen eines unteren Begrenzungssteils dienenden Kopf (4), der an dem oberen Rahmen (1) vertikal beweglich angeordnet ist und einen Stauchstempel (2) aufweist, einem unteren Rahmen (5), einem zum Festhalten des Schiebers dienenden Ausleger (6), der an dem unteren Rahmen (5) starr befestigt und aus einer genau unter dem Stauchstempel befindlichen Position zu der der Bedienungsperson zugekehrten Seite hin versetzt ist, und einem Gesenkhalter (9), der an dem unteren Rahmen (5) zwischen der Posi-

tion genau unter dem Stauchstempel (2) und dem Ausleger (6) angeordnet ist, wobei der Gesenkhalter (9) an seiner Oberseite ein Gesenk (8) aufweist und zwischen einer ersten Stellung, in der das Gesenk (8) mit dem Stauchstempel (2) fluchtet, und einer zweiten Stellung bewegbar ist, in der das Gesenk (8) gegenüber dem Stauchstempel (2) versetzt ist, dadurch gekennzeichnet, daß zwei Schubplatten (10, 10) auf gegenüberliegenden Seiten des Gesenkhalters (9) angeordnet sind und flügelartig abstehen, wodurch der Gesenkhalter (9) vorwärtsbewegt wird, um das Gesenk (8) genau unter dem Stauchstempel (2) anzuordnen, wenn die Schubplatten (10, 10) von den die Reißverschlußkette (30) erfassenden Fingern der Bedienungsperson vom Ausleger (6) weggedrückt werden, wobei die Schubplatten (10, 10) am Gesenkhalter (9) einstellbar befestigt sind, so daß der Abstand zwischen den Schubplatten (10, 10) und dem Gesenk (8) des Gesenkhalters (9) einstellbar ist.

2. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß jede Schubplatte (10) mit einer Befestigungsplatte (10a) versehen ist, die zwei parallele obere und untere Schlitze (15, 15) aufweist, die sich in Bewegungsrichtung des Gesenkhalters (9) erstrecken, und daß der Gesenkhalter (9) auf gegenüberliegenden Seiten mit zwei Klemmschrauben (16, 16) versehen ist, welche die entsprechenden oberen und unteren Schlitze (15, 15) durchsetzen.

Revendications

1. Une machine de finition de fermetures à glissière comprenant un bâti supérieur (1), une tête (4) de fixation de butée inférieure montée sur ledit bâti supérieur (1) en vue d'un déplacement vertical et comportant un poinçon (2), un bâti inférieur (5), un montage (6) de support de curseur monté de façon fixe sur ledit bâti inférieur (5) et décalé de la position située juste en dessous dudit poinçon (2) en direction du côté orienté vers l'opérateur, et un porte-matrice (9) monté sur ledit bâti inférieur (5) entre ladite position située juste en dessous du poinçon (2) et ledit montage (6) de support de curseur, ledit porte-matrice (9) comportant une matrice (8) sur son dessus et pouvant être déplacé entre une première position dans laquelle ladite matrice (8) est alignée avec ledit poinçon (2) et une seconde position dans laquelle la matrice (8) est décalée du poinçon (2), caractérisée par le fait qu'une paire de plaques de poussée (10, 10) sont disposées sur les côtés opposés du porte-matrice (9) et font saillie à la manière d'une aile, de sorte que lorsque les plaques de poussée (10, 10) sont écartées manuellement du montage (6) par les doigts de l'opérateur qui saisissent les chaînes (30) de fermeture à glissière, le porte-matrice (9) avance de manière à placer la matrice (8) dans une position située juste en dessous du poinçon (2), lesdites plaques de poussée (10,



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2. The slide fastener finishing machine as set forth in claim 1 in which each of said pusher plates (10) is provided with a mounting plate (10a) having a pair of upper and lower parallel slots (15, 15) extending in the direction of movement of the die holder (9), and in that said die holder (9) is provided on opposite sides thereof with two clamping bolts (16, 16) extending through the corresponding upper and lower slots (15, 15).

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10) étant fixées de façon réglable audit porte-matrice (9) de sorte que la distance entre les plaques de poussée (10, 10) et la matrice (8) du porte-matrice (9) peut être réglée.

2. La machine de finition de fermetures à glissière selon la revendication 1, dans laquelle chacune desdites plaques de poussée (10) est munie d'une plaque de montage (10a) compor-

tant une paire de fentes parallèles supérieure et inférieure (15, 15) s'étendant dans la direction du déplacement du porte-matrice (9) et par le fait que ledit porte-matrice (9) est muni sur ses côtés opposés de deux vis de blocage (16, 16) s'étendant à travers des fentes supérieure et inférieure correspondantes (15, 15).

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