

Aug. 11, 1931.

H. LAMB

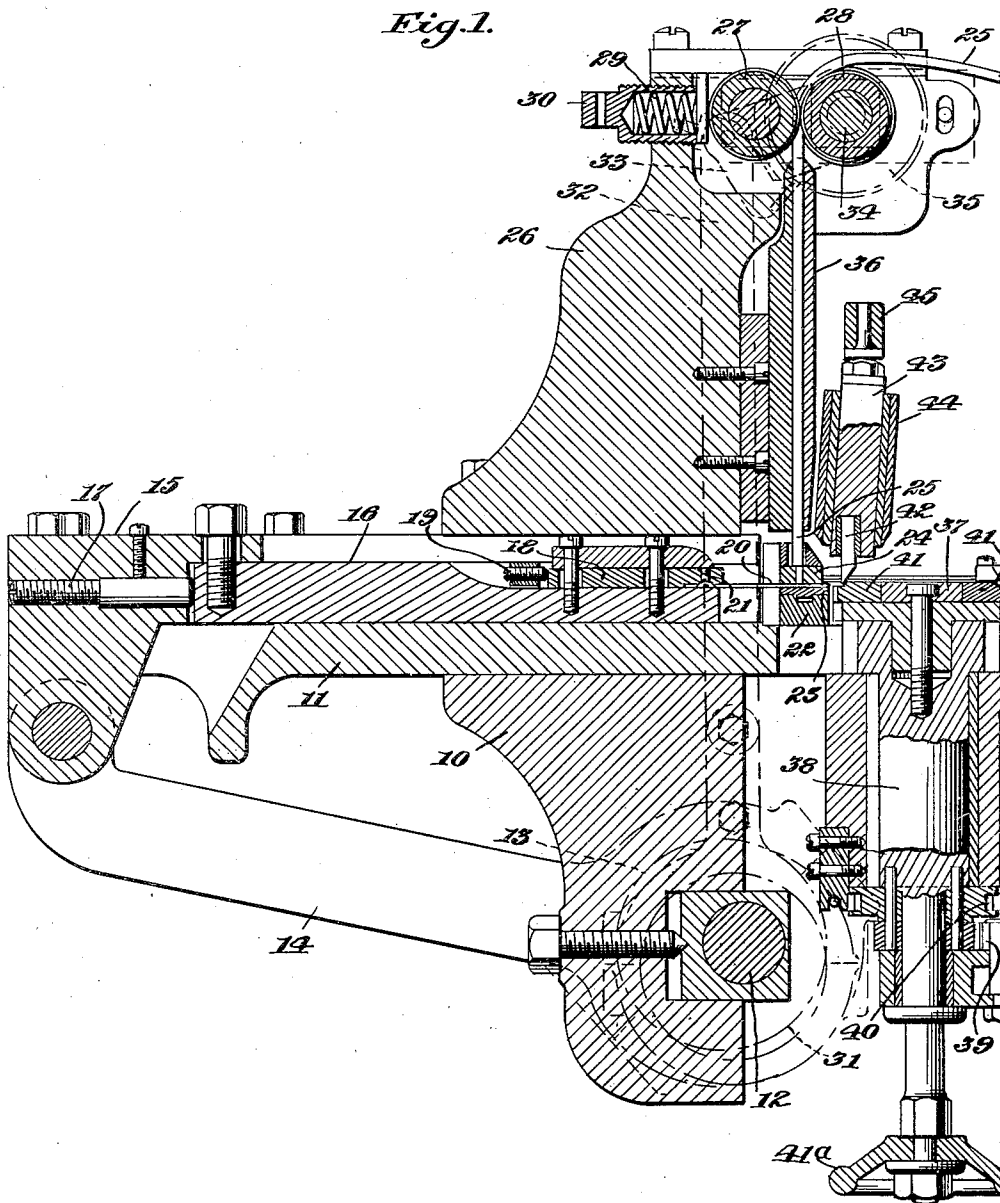
1,817,990

FASTENER MAKING MACHINE

Filed Dec. 21, 1929

2 Sheets-Sheet 1

Fig.1.



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Fig. 2.

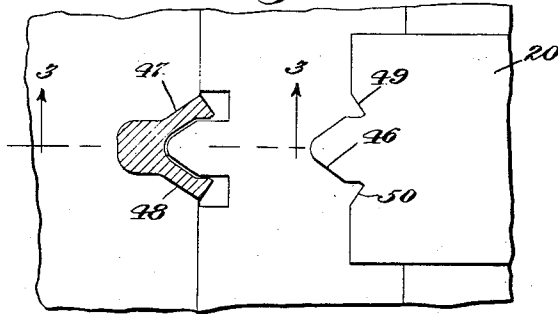


Fig. 4.

OLD METHOD

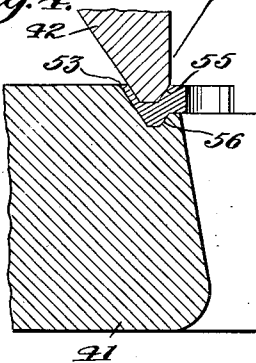
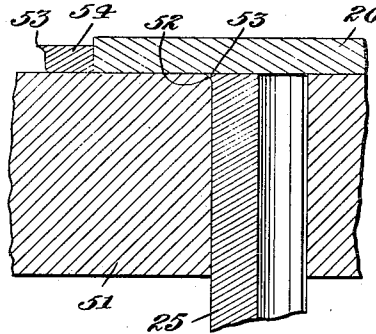


Fig. 5.



NEW METHOD

Fig. 5.

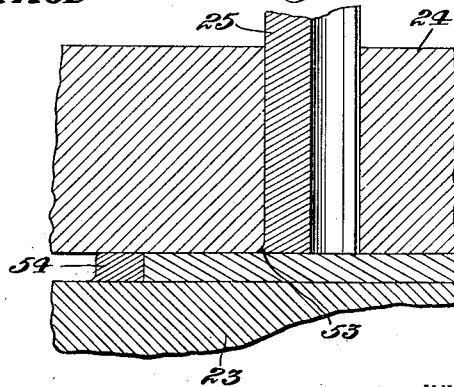
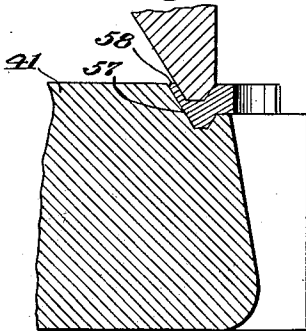


Fig. 6.



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UNITED STATES PATENT OFFICE

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FASTENER MAKING MACHINE

Application filed December 21, 1929. Serial No. 415,730.

My invention relates to a method and machine for making fastener elements and particularly to making fastener elements for slide fasteners of the same general type as disclosed in the patent to Gideon Sundback No. 1,219,881, March 20, 1917.

It is the general object of my invention to provide an improved method and machine for making the fastener elements so that a much smoother fastener is produced than has heretofore been done.

A machine of the same general type as disclosed in the patent to Gideon Sundback No. 1,467,015, September 4, 1923, has been used successfully for making stringers for slide fasteners. In the patented machine a wire of special cross-section is fed upwardly from the under side of a platform and blanks are sliced off from the upper end of this wire as it is intermittently fed through a cutting die. These blanks are in turn placed in a recessed forming die and a vertically reciprocating punch is operated downwardly to press a blank which has been sliced off into the recessed die to form the interlocking projection and recess. During the slicing operation a small burr is sometimes left on the front side of the wire after the blank has been sliced off and this is particularly true when the cutting dies become slightly worn. When the wire is next fed upwardly this burr is found on the next blank to be sliced off and the blank is thus placed in the recessed die with the burr on the upper or outer side of the die. The burr being at this point, is not always completely absorbed during the operation of punching the blanks into the recessed die to form the interlocking projection. I have discovered that by feeding the wire into the machine from above the platform and placing the stationary cutting die above the movable cutting knife that this burr is left on the lower side of the fastener blank and when the blank is placed in the recessed die the burr will come against the flat forming surface of the die and be absorbed in the operation of forming the interlocking projection.

The fastener making machine of the type to which my invention relates comprises a

series of related mechanisms and since my invention is concerned with only a portion of such mechanisms, the machine will not be illustrated and described in complete detail. For a full disclosure of the related mechanisms reference may be had to the patent to Sundback No. 1,467,015. The machine disclosed in this patent has means for placing the blanks in a series of dies spaced around the periphery of a rotating dial and this dial is intermittently rotated to bring the blanks in turn into line with a punch mechanism and with clamping jaws where it is attached to a fabric stringer. The punch mechanism is operated in properly timed relation to form in conjunction with the forming die in which the blank is resting, the interlocking recess and projection of the fastener element. Mechanism is also provided for feeding the tape intermittently between the clamping portions of the fastener element and side tools are reciprocated at the proper time to clamp the fastener element to the stringer.

In the accompanying drawings, I have shown for purposes of illustration one embodiment which my invention may assume in practice. In these drawings:

Fig. 1 is a vertical sectional view through a portion of a fastener making machine embodying my invention.

Fig. 2 is a fragmentary view of the cutting dies.

Fig. 3 is a vertical section corresponding to a section on line 3—3 of Fig. 2 illustrating the old method of feeding and cutting off the wire which my invention is designed to improve.

Fig. 4 is a view of the fastener element while being formed in the forming die when the blanks are fed and sliced off as in Fig. 3.

Fig. 5 is a view similar to Fig. 3 on line 3—3 of Fig. 2 showing the difference in die arrangement required to carry out my invention.

Fig. 6 is a view of the fastener element in the forming die when the blanks are fed and sliced off as shown in Fig. 5.

In the portion of the machine illustrated in Fig. 1 there appears a part of the stationary base frame 10 which carries a suitable

stationary table or platform 11. A shaft 12 is rotatably supported in the base frame and is driven at the desired speed by a suitable motor and gearing not illustrated. On this shaft is an eccentric 13 which operates a connecting rod 14 connected to a reciprocating mechanism generally designated 15. The principal part of this mechanism is a slid 16 which reciprocates horizontally in suitable guides carried by the table 11. This slide is adjustable relative to the connecting rod 14 by means of suitable mechanism including an adjusting screw 17. At the front end of this slide is adjustably mounted the knife carrier 18, which may be adjusted lengthwise of the slide by an adjusting screw 19. A knife 20 is connected by means of a screw 21 to this knife carrier and the thickness of the knife is comparatively small, being the same as that desired in the fastener blank. The front end of the knife is supported during motion by a stationary support 22 which carries a guide plate 23. The cutting die 24 is mounted above the knife instead of below it as heretofore and the wire 25 is fed downwardly through the knife die.

The frame is extended upwardly to provide a stationary support 26 which carries the wire feeding mechanism. Instead of locating the feeding mechanism below the knife die as disclosed in the above mentioned patent, it is desirable in carrying out my invention to locate it directly above the knife die. This mechanism comprises a pair of rollers 27 and 28 which are suitably grooved to fit the wire and which are held in frictional engagement with the wire by means of a spring 29 which is adjustable by a screw 30. The feed rollers are driven from the shaft 12 by an eccentric 31 and connecting rod 32 which operate a pawl mechanism 33 pivotally mounted on the shaft 34 which carries the feed roller 28. A ratchet wheel 35 is mounted on the same shaft 34 and has teeth spaced around its periphery to cooperate with the pawl 33. The eccentric 31 is so positioned as to affect an actuation of the feed rolls at the proper time while the knife is withdrawn from the knife die. The ratchet wheel is so driven as to feed the wire just the right amount to provide the desired thickness of the fastener blank. After the wire passes through the feed rolls it is received by a suitable guide 36 which extends to a point closely adjacent the cutting die.

The rotating dial 37 is supported on a vertical shaft 38 which is operated by means of a ratchet and pawl mechanism 39 which may be driven from the shaft 12 or any other suitable means as described in the above mentioned patent. A brake mechanism 40 prevents rotation of the shaft 38 beyond the points to which it is actuated by the ratchet mechanism 39. A hand wheel 41a is provided on the end of this shaft to adjust the dial

manually. The dial 37 carries a series of forming dies 41 equally spaced around its periphery and these dies are progressively brought into alignment with the knife 20 to receive the fastener blanks in turn. Immediately after a blank is received in one of the dies 41 a punch 42 is depressed to form the interlocking recess on the fastener element is being understood that metal is displaced from the blank into the forming die at the same time to form the interlocking projection on the fastener element. The punch is carried by a punchholder 43 which reciprocates in a stationary guide 44 and the punch is preferably depressed by a hammer mechanism 45 which is operated in a manner similar to that described in connection with the punch mechanism of the above mentioned patent.

The contour of the knife 20 is best illustrated in Fig. 2 and comprises a V-shaped nose portion 46 adapted to enter the space between the clamping portions 47 and 48 of the fastener blank. The knife is also recessed as indicated at 49 and 50 to receive the ends of the fastener blank. The knife die and wire guide are also shaped in cross-section so as to conform to the shape of the wire from which the blanks are made.

Referring now to Figs. 3 and 4 which illustrate the old method of making the fastener element, the wire 25 is fed upwardly through a knife die 51 positioned directly under the knife 20. After continued use, the corner 52 of the knife die becomes slightly rounded and after each movement of the knife 20 a small burr 53 is sometimes left on the advancing end of the wire. As the blank 54 which has been sheared off, moves into the forming die 41 this burr 53 is positioned at the outer edge of the forming die and when the punch 42 is depressed to form the interlocking recess 55 and projection 56, the burr 53 remains on the blank without being absorbed wholly into the metal during the forming operation.

Now with my improved machine and method of feeding the wire and shearing off the blanks as indicated in Figs. 5 and 6 the burr 53 on the advancing end of the wire is disposed on that side of the blank which forms the projection when the blank is in the forming die. This is due to the fact that the knife die 24 is located above the knife and instead of feeding the wire upwardly it is fed downwardly. In Fig. 6 it will be noted that when the blank 54 moved into the forming die, the burr came into contact with the flat surface 57 of the die and was necessarily absorbed in the metal during the forming operation. The edge 58 of the fastener element is thus left free from any burrs.

As a result of my invention it will, therefore, be seen that a very simple modification of a standard fastener making machine is

all that is required to insure the production of a smooth fastener. This is a very desirable result particularly when it is considered that the fastener is frequently applied to such articles as ladies handbags where any sharp edges adjacent the opening through which the hand must be inserted, is very objectionable.

While I have in this application, specifically shown and described one embodiment of my invention and have shown it incorporated in one type of fastener making machine, it will be understood that the invention may be embodied in various other forms and be used with other types of machines than the one shown.

I claim:

1. A method of forming a fastener element comprising feeding a wire of special cross-section, slicing a blank from the end of said wire and leaving a burr on such blank, placing the blank in a forming die with the burr against a forming surface of the die, and pressing said blank into said die to form an interlocking projection and simultaneously absorb said burr.

2. In a machine for forming fastener elements, means for feeding a wire of special cross-section, means for slicing blanks from the end of said wire, a recessed forming die for receiving said blanks in turn, and a punch mechanism cooperating with said recessed die to form an interlocking projection, and recess on each of said blanks, the direction of feed of said wire being the same as the direction of movement of said punch in forming the projection.

3. In a machine for forming fastener elements, means for feeding a wire of special cross-section, means for slicing a blank from the end of said wire, a recessed die adjacent said slicing means for receiving the blank, the recess of said die facing in the direction opposite to the direction of feed of said wire, and a punch cooperating with said die to form an interlocking projection and recess.

4. In a machine for forming fastener elements, a stationary cutting die, means for feeding a wire of special cross section downwardly from the upper side of said cutting die, a cutting knife cooperating with said cutting die for slicing blanks from the end of said wire, a forming die with an upwardly facing recess for receiving said blank, and a vertically reciprocating punch adapted when depressed to press said blank into the die and form an interlocking projection.

5. The method of forming fastener elements of a generally elongated block-like shape each having a pair of clamping jaws at one end and interlocking means at the other or head end comprising shearing substantially Y-shaped flat metal blanks, placing such blanks individually in dies in such a manner that a burr formed during shearing

on one corner of the head end of each element will lie against a relatively broad flat surface of said die, and pressing said blank in said die whereby said burr is absorbed by said flat surface of the die.

6. The method of forming fastener elements of the type having clamping jaws at one end and interlocking projections and recesses on opposite sides at the other or head ends of the elements, and an inclined guiding surface at the head end of each element co-extensive with the projection which comprises shearing substantially flat U-shaped blanks from a strip, placing the head end of each blank in a die for forming the interlocking projection and inclined surface in such relative position that any burr which may be formed on one corner of the head end of the blank during shearing will lie against said inclined flat surface, and punching out an interlocking recess and simultaneously pressing the head end of said blank into said die to form said projection and guiding face whereby the burrs are flattened out by the inclined face of said die.

In testimony whereof I affix my signature.

HAROLD LAMB.