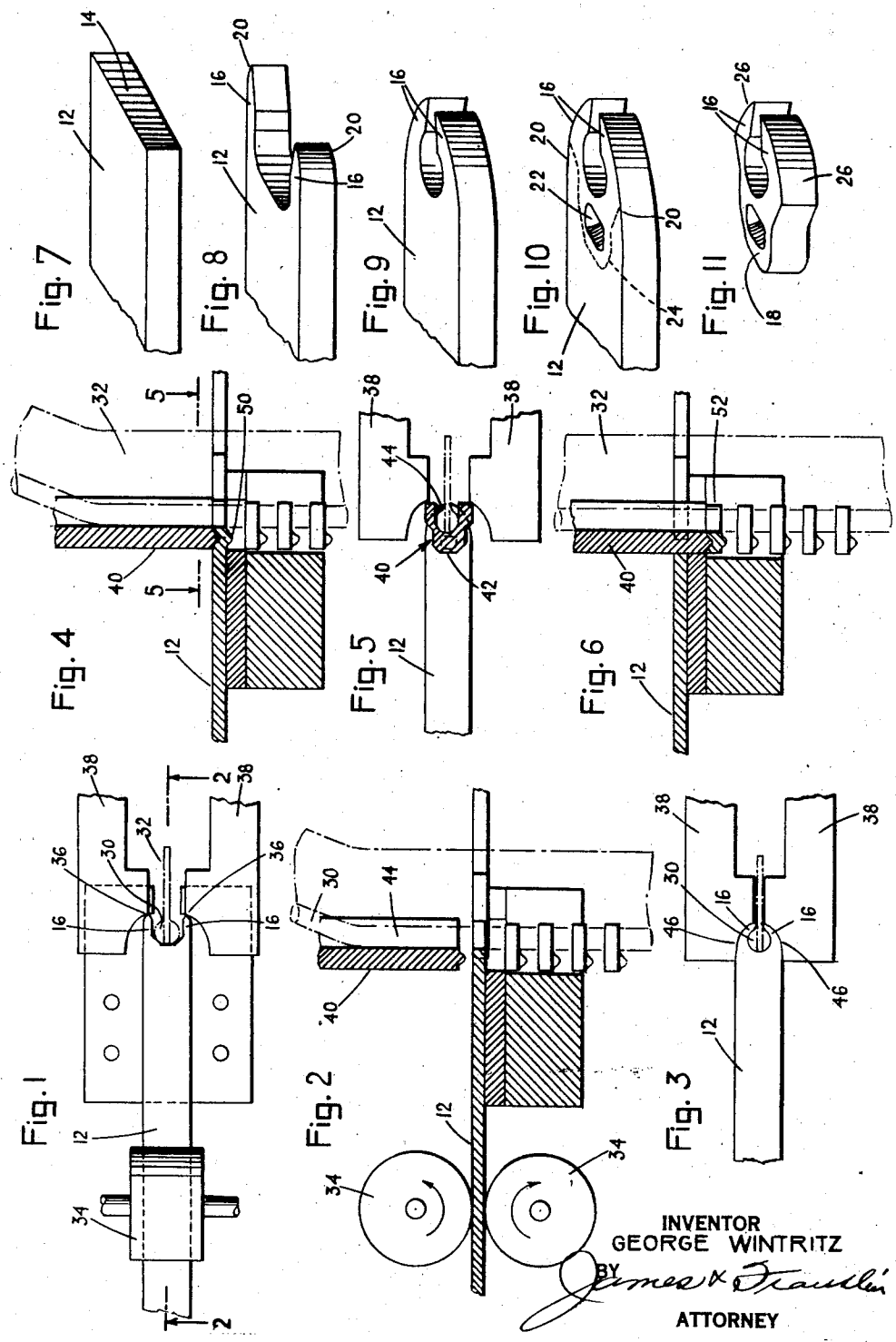
Oct. 20, 1942. G. WINTRITZ 2,299,606

METHOD OF MAKING SLIDE FASTENERS

Filed Dec. 19, 1939 2 Sheets-Sheet 1



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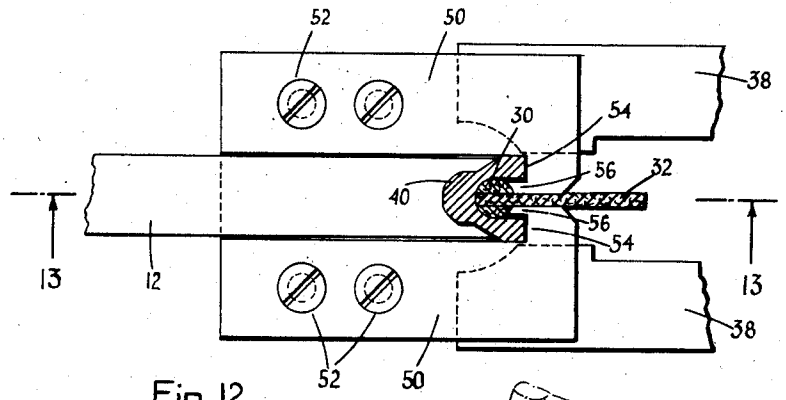


Fig. 12

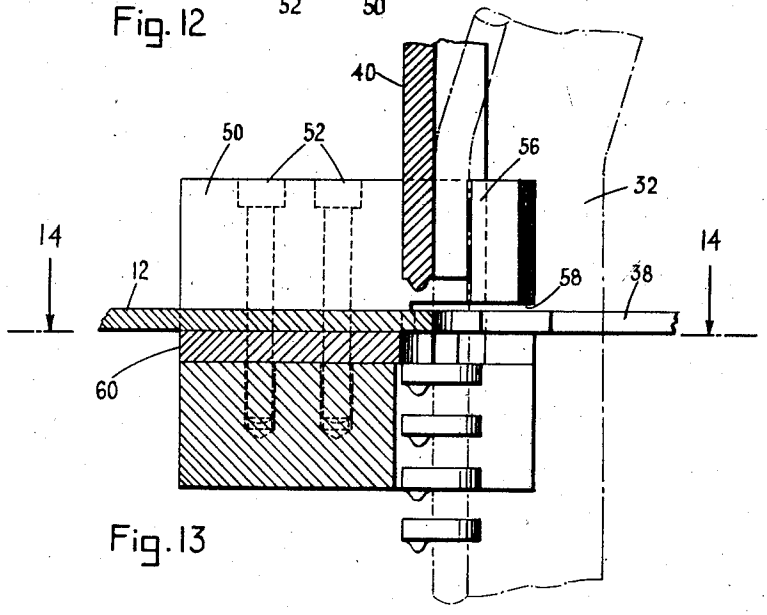


Fig. 13

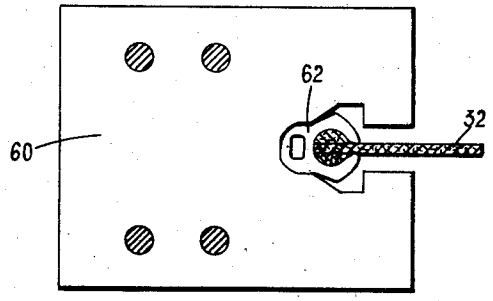


Fig. 14

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Patented Oct. 20, 1942 2,299,606

UNITED STATES PATENT OFFICE

2,299,606

METHOD OF MAKING SLIDE FASTENERS

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Application December 19, 1939, Serial No. 309,948

6 Claims. (Cl. 29—148)

This invention relates to slide fasteners, and more particularly to a method of making the same.

The primary object of my invention is to generally improve the manufacture of slide fasteners. A more particular object is to provide a method for forming the slide fastener elements without waste from a smooth-edged strip, and attaching the elements to a tape, and feeding the tape, in as simple a manner as possible.

To the accomplishment of the foregoing, and such other objects as will hereinafter appear, my invention consists in the method steps and their relation one to the other, as hereinafter are more particularly described in the specification and sought to be defined in the claims. The specification is accompanied by drawings, in which:

Fig. 1 is a plan view of schematically illustrated apparatus for practicing the invention;

Fig. 2 is a vertical section taken in the plane of the line 2—2 of Fig. 1;

Fig. 3 is a view similar to Fig. 1, but showing the clamping of the jaws on the tape;

Fig. 4 is a section similar to Fig. 2, but showing partial descent of the punch;

Fig. 5 is a horizontal section taken approximately in the plane of the line 5—5 of Fig. 4;

Fig. 6 is a section similar to Fig. 4, but showing full descent of the punch;

Fig. 7 is a perspective view showing the strip or wire from which the elements are formed;

Fig. 8 is a similar view showing the end of the strip cut to form a jaw opening;

Fig. 9 is a similar view showing the jaw closed, but with the tape omitted;

Fig. 10 is a similar view showing the coining of a recess and projection;

Fig. 11 illustrates the configuration of the completed element when severed from the strip;

Fig. 12 is a plan view showing the tape guide;

Fig. 13 is a section taken in the plane of the line 13—13 of Fig. 12; and

Fig. 14 is a horizontal view taken in the plane of the line 14—14 of Fig. 13, and showing the die.

Referring to the drawings, and more particularly to Figs. 7 through 11, the elements are formed from a strip or wire of metal 12 preferably having a rectangular cross section, as is indicated at the end 14. After the machine has been put into operation, the blanking of an element from the strip leaves the strip with spaced jaws 16 having a jaw opening therebetween. This jaw opening conforms in dimension and shape to the head of the finished element, this being indicated at 18 in Fig. 11. Reverting to Fig. 8, there is an inward curvature at 20 at the ends of the jaws, but this is not due to the blanking operation, and instead results from the closing of the jaws of the preceding element. Thus, referring to Fig. 10, it will be seen that the inward bending or closing of the jaws 16, while these jaws are still integral with the strip 12, draws metal inwardly somewhat at the parts 20, although these subsequently form a part of the next succeeding element.

In the present method the jaws are clamped on the tape before the element is cut from the strip 12. This is indicated in Fig. 9, in which the jaws 16 are shown closed, but in Fig. 9 the tape has been omitted in order to more clearly show the configuration of the fastener element itself. The material is then coined to form a recess 22, and this displaces metal downwardly, thereby forming a projection on the opposite side of the element. This projection is not visible in Fig. 10. The element is next blanked or severed from the strip, this being done along the dotted outline 24. Inasmuch as the jaws have already been clamped on the tape, the punch movement which coins and shears the element from the strip may also be used to feed the element and with it the tape, thus dispensing with the need for special tape feed means. The finished element is not a conventional element having parallel side edges, but instead has a special configuration which is rather clearly shown in Fig. 11. It will be understood that the outside walls 26 of the jaws 16 are the original side edges of the strip 12, these side edges being unchanged, except for their curved and convergent relation caused by closing or clamping of the jaws on the tape.

Referring now to Fig. 1, the strip 12 is fed forwardly toward the beaded edge 30 of a tape 32 by any suitable feed means. In the present case, this is illustrated by feed wheels 34 which frictionally engage the strip 12 and may, therefore, be rotated continuously. The forward movement of strip 12 may be limited by suitable stop means, here exemplified by the parts 36 of a pair of clamping plates 38. This movement of strip 12 brings the jaws 16 astride the tape, as is shown in Fig. 1, and it also brings the end of strip 12 into the field of action of a vertically reciprocable punch 40, as is shown in Fig. 2. The section shape of punch 40 is preferably as illustrated in Fig. 5, in which it will be seen that the part 42 of the punch is shaped to form the head of the element, while the opposite side of the punch is cut away or channeled at 44 to receive the tape bead 30.

During the advance of strip 12 the punch 40 is elevated. It remains elevated until after the clamping plates 38 have acted. This is indicated in Fig. 3 which clearly shows how the closing of plates 38 clamps the jaws 16 on the edge 30 of the tape. The curved surfaces 46 on the clamping plates impart the desired configuration to the jaws 16 as they are closed.

After clamping the jaws on the tape, the plates 38 again separate or are moved back to initial position, as is clearly shown in Fig. 5. At this time they are in such position as to clear the punch 40. The punch then descends and strikes the metal strip 12 to coin and blank the same. In Fig. 4 the punch has moved down far enough to form the desired recess on the upper side of the strip, and the downward displacement of material caused by the punch also results in the formation of a projection 50 on the lower side of the strip.

Continued descent of the punch shears the endmost element from the strip, this being shown in Fig. 6, in which the element has been moved downwardly from the level of strip 12 to the point 52. Inasmuch as the element has already been clamped on the tape 32, the latter is fed downwardly with the element by the punch. The stroke of the punch is made such as to move the element and tape the exact amount necessary to produce the desired spacing or pitch of elements along the tape. The punch then rises to the position shown in Fig. 2, and as soon as the punch rises above the level of strip 12, the latter is advanced by the feed wheels 34, whereupon the entire cycle is repeated.

Referring now to Figs. 12 and 13, the tape 32 is guided by tape guide blocks 50 which are mounted at each side of the strip 12. The blocks may be held in position on the die by suitable means, such as the screws 52. The blocks 50 are so shaped at 54 as to clear the punch 40, and include parts 56 which bear against the bead 30 of tape 32 and thereby hold the tape accurately in position. In Fig. 13 it will be seen that the tape guides are cut away at the bottom to provide clearance 58 for the clamping blades 38.

Fig. 14 shows the die plate 60 which is shaped to accurately receive the punch. This necessarily provides adequate clearance for downward movement of the clamped elements, as is indicated by the element 62 disposed in the die opening.

It is believed that the method of my invention, as well as the advantages thereof, will be apparent from the foregoing description. The elements are formed without scrap or waste from a simple smooth edged strip of metal. The strip is advanced to the tape and the jaws are clamped on the tape before the punch comes into operation. When the punch operates it coins the desired projection and recess, and it shears or blanks the element from the strip, and in addition it feeds the element and with it the tape, the amount needed for proper spacing between elements. The method is direct and simple and results in an extreme simplification of the apparatus used for practicing the method.

It will be apparent that while I have shown and described my invention in a preferred form, many changes and modifications may be made without departing from the spirit of the invention defined in the following claims.

I claim:

1. In the manufacture of slide fasteners, the method which includes forming a jaw opening at the end of a smooth-edged strip of metal, said jaw opening being shaped and dimensioned to conform to the heads of the desired fastener elements, whereby the elements may be formed without waste, advancing the jaw end of the strip to the beaded edge of a tape, closing the jaws in order to clamp the same securely on the beaded edge of the tape, the outside walls of the jaws being formed from the side edges of the strip, blanking an element including the closed jaws from the end of the strip by means of a punch having a Y-shaped section and operating at the edge of the tape in the direction of the tape, the arms of the Y straddling the bead of the tape, and the stem of the Y being shaped to form the head of the element and to thereby leave a new jaw opening at the end of the strip.

2. In the manufacture of slide fasteners, the method which includes forming a jaw opening at the end of a smooth-edged strip of metal, said jaw opening being shaped and dimensioned to conform to the heads of the desired fastener elements, whereby the elements may be formed without waste, advancing the jaw end of the strip to the beaded edge of a tape, closing the jaws in order to clamp the same securely on the beaded edge of the tape, blanking an element including the closed jaws from the end of the strip by means of a punch having a Y-shaped section and operating at the edge of the tape in the direction of the tape, the arms of the Y straddling the bead of the tape, and the stem of the Y being shaped to form the head of the element and to thereby leave a new jaw opening at the end of the strip, and feeding the tape an amount equal to the desired pitch or spacing between elements on the tape.

3. In the manufacture of slide fasteners, the method which includes forming a jaw opening at the end of a smooth-edged strip of metal, said jaw opening being shaped and dimensioned to conform to the heads of the desired fastener elements, whereby the elements may be formed without waste, advancing the jaw end of the strip to the beaded edge of a tape, closing the jaws in order to clamp the same securely on the beaded edge of the tape, blanking an element including the closed jaws from the end of the strip by means of a punch having a Y-shaped section and operating at the edge of the tape in the direction of the tape, the arms of the Y straddling the bead of the tape, and the stem of the Y being shaped to form the head of the element and to thereby leave a new jaw opening at the end of the strip, at the same time feeding the element and with it the tape by means of the punch, and moving the punch an amount greater than needed for the blanking operation and great enough to feed the tape an amount equal to the desired pitch or spacing between elements on the tape.

4. In the manufacture of slide fasteners, the method which includes forming a jaw opening at the end of a smooth-edged strip of metal, said jaw opening being shaped and dimensioned to conform to the heads of the desired fastener elements, whereby the elements may be formed without waste, advancing the jaw end of the strip to the beaded edge of a tape, closing the jaws in order to clamp the same securely on the beaded edge of the tape, blanking an element including the closed jaws from the end of the strip by means of a punch having a Y-shaped section and operating at the edge of the tape in the direction of the tape, the arms of the Y straddling the

bead of the tape, and the stem of the Y being shaped to form the head of the element and to thereby leave a new jaw opening at the end of the strip, and at the same time coining a recess and projection on the head of the element by means of the punch.

5. In the manufacture of slide fasteners, the method which includes forming a jaw opening at the end of a smooth-edged strip of metal, said jaw opening being shaped and dimensioned to conform to the heads of the desired fastener elements, advancing the jaw end of the strip to the beaded edge of a tape, closing the jaws in order to clamp the same securely on the beaded edge of the tape, blanking an element including the closed jaws from the end of the strip by means of a punch operating at the edge of the tape and shaped to form the head of the element and to thereby leave a new jaw opening at the end of the strip, and at the same time coining a recess and projection on the head of the element and feeding the element and with it the tape by means of the punch an amount equal to the desired pitch or spacing between elements on the tape.

6. In the manufacture of slide fasteners, the method which includes forming a jaw opening at the end of a smooth-edged strip of metal, said jaw opening being shaped and dimensioned to conform to the heads of the desired fastener elements, frictionally feeding the strip to bring the jaw end thereof into engagement with abutments so positioned that the jaws are astride a tape, closing the jaws in order to clamp the same securely on the beaded edge of the tape, blanking an element including the closed jaws from the end of the strip by means of a punch operating at the edge of the tape and shaped to form the head of the element and to thereby leave a new jaw opening at the end of the strip, and at the same time coining a recess and projection on the head of the element and feeding the element and with it the tape by means of the punch an amount equal to the desired pitch or spacing between elements on the tape.

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