The present invention is directed to a cutting and crimping tool, and more particularly to a cutting and crimping tool which may be used to cut the fastener element carrying tapes of a slide fastener and to apply a clip to permanently join the tapes of the slide fastener together.

In the application of concealed slide fasteners to cloth panels, it is desirable to have means for rapidly and cleanly cutting the fastener element carrying tapes at a desired location and then forming and applying a clip to the fastener element carrying tapes. Thus, where the ends of fastener element carrying tapes are desired to be cut, with such cut ends subsequently joined together, it is essential for high speed production that a simple durable cutting and crimping tool be provided to perform this operation.

This invention has as an object the provision of a novel cutting and crimping tool.

This invention has as another object the provision of a cutting and crimping tool which may be used to rapidly and accurately cut the fastener element carrying tapes of a slide fastener and apply a clip to the tapes of the slide fastener.

This invention has as yet another object the provision of a cutting and crimping tool having a long useful operating life, whose cutting surfaces may be sharpened at will.

Other objects will appear hereinafter.

For the purpose of illustrating the invention there is shown in the drawings forms which are presently preferred; it being understood, however, that this invention is not limited to the precise arrangements and instrumentalities shown.

Figure 1 is a plan view of one embodiment of the cutting and crimping tool of the present invention.

Figure 2 is a side elevational view of the embodiment of Figure 1.

Figure 3 is a section taken on line 3—3 of Figure 1. Figure 4 is a fragmentary view revealing the crimping operation which may be performed by the tool of Figure 1.

Figure 5 is a fragmentary plan view of another embodiment of the cutting and crimping tool of the present invention.

Figure 6 is a section taken on line 6—6 with a clip to be applied to the fastener element carrying tapes of a slide fastener positioned within the tool.

Figure 7 is a perspective view of a formed clip made by the cutting and crimping tool of Figure 5.

Referring to the drawings and initially to Figures 1 through 4 inclusive, the cutting and crimping tool of the present invention is designated 10. Such cutting and crimping tool 10 comprises a pair of handles 12 and 14 pivotably secured together by the bolt 16, washer 18 and nut 20. The handles 12 and 14 are relieved in the region adjacent the bolt 16 in order to provide for relative pivotable movement of the handles 12 and 14 in the same plane.

The jaws 22 and 24 of respective handles 12 and 14 are each provided with threaded openings 26 for receiving the screws 28.

The overlapping cutting blades 30 and 32 are carried on the surfaces of jaws 22 and 24 which are juxtaposed to the heads of screws 28. Each of the cutting blades 30 and 32 is provided with a pair of elliptical slots to receive the screws 28. In this manner relative adjustment of the cutting blades 30 and 32 in respect to the jaws 22 and 24 may be made. As seen particularly in Figures 1 and 3 a gap 34 is provided intermediate the jaws 22 and 24, with the cutting blades 30 and 32 overlapping in the gap region 34. The gap 34 should have its principal dimension running lengthwise and serves to separate the major portions of the jaws 22 and 24.

The tip portions 36 and 38 of the jaws 22 and 24 respectively are provided with inwardly directed land portions 37 which engage each other on the center line of the cutting and crimping tool 10 in the closed position of said jaws 22 and 24. The jaw 22 is provided with an integral land portion 39 at its tip. The jaw 24 is provided with an integral land portion 41 at its tip juxtaposed to the land portion 39. The land portions 37 are integral with the jaws 22 and 24 and are spaced from the land portions 39 and 41. Jaw 24 is provided with a recess 42 between the land portions 37 and 41. Jaw 22 is provided with a recess 40 between the land portions 37 and 39. The recesses 40 and 42 form an elliptical notch having its major diameter perpendicular to the longitudinal axes of the jaws 22 and 24. As seen more clearly in Figure 1, when the jaws 22 and 24 are in their closed position, the land portions 37 are abutting one another with the rear wall surface of each of the mating recesses 40 and 42 united as a continuous surface. When the jaws 22 and 24 are in their closed position, the ends of the land portions 39 and 41 are spaced from one another thereby defining a gap 43. The gap 43 permits an article (see description of operation in connection with Figure 4) to extend from beyond the front of the cutting and crimping tool 10 to within the mating halves 40 and 42.

Referring now specifically to Figure 4 there is shown therein the operation of the cutting and crimping tool 10 in applying a clip 44 to the fastener elements 46 and 48 by means of the cutting blades 30 and 32. Thus, the tapes 50 and 52 may be cut at any predetermined location.

The clip 44 preferably formed from a light soft metal such as aluminum is applied to the fastener elements 46 and 48 as follows:

The clip 44 is initially merely a gently bent clip. For example, a prebent clip may be provided whose degree of curvature is less than that which is necessary for application to the fastener elements 46 and 48. If desired, a long sheet of bent metal may be provided and the individual clips cut therefrom by the user employing the cutting blades 30 and 32.

The tapes 50 and 52 with their juxtaposed plies 54 and 56 is inserted within the mating halves 40 and 42 with the fastener elements 46 and 48 being disposed within the mating recesses 40 and 42. The clip 44 is juxtaposed to the wall surface of the mating recesses 40 and 42 in the manner shown in Figure 4 and is disposed intermediate such wall surface and the fastener elements 46 and 48. The tapes 50 and 52 and the plies 54 and 56 extend from the mating recesses 40 and 42 through the gap 43.

In order to crimp the clip 44 onto the fastener elements 46 and 48 the handles 12 and 14 are brought to-
gether (see arrows in Figure 4). Thus, the clip 44 may be positioned at a predetermined desired location.

In the embodiment shown in Figures 5 and 6 the cutting and crimping tool 10 generally resembles the cutting and crimping tool 10a except that the mating recesses 40a and 42a are sculptured so that the clip 44a is provided at its rear end 58 with an inwardly beveled edge. This is most desirable where there is a possibility that the clip 44a will come in contact with either the skin of the user or articles of apparel worn by the user since the possibility of scratching due to the sharp rear free edge of the clip is eliminated.

Reference to Figures 5 and 6 will reveal the manner in which the mating recesses 40a and 42a have been sculptured in order to achieve the beveling shown in Figure 7. Thus, each of the mating recesses 40a and 42a (see mating recess 42a shown in Figure 6) is provided with a thrust shoulder 60 against which the clip 44a is positioned at the instant the crimping is effected. The opposite portion of the mating recess 42a (the construction of mating recess 40a is identical to that of 42a) is provided with a shaping shoulder 62 which is built up and relieved in such manner as to produce the beveled rear end 58 of clip 44a when the soft metal clip precursor is inserted within the mating recesses 40a and 42a. The shape of shaping shoulder 62 may be varied to produce any intended degree of beveling to the rear end 58 of the clip 44a.

Except for the changes indicated in Figures 5 and 6 in the mating recesses 40 and 42, the cutting and crimping tool 10a generally resembles the cutting and crimping tool 10.

Since the blades 30 and 32 may be readily replaced, and since there is no appreciable wear on the mating recesses 40 and 42 of the cutting and crimping tool 10, the useful operating life of such tool is a most long one. The cutting blades 30 and 32 may be sharpened as often as is necessary to provide for facile cutting of the tapes 50 and 52.

The present invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof and, accordingly, reference should be made to the appended claims, rather than to the foregoing specification as indicating the scope of the invention.

We claim:

1. In a plier type tool comprising a pair of handles pivotally secured together, each handle having a jaw, said jaws being in the same plane, each jaw having integral spaced land portions and a recess extending between said land portions, said recesses forming a substantially elliptical notch, the major diameter of said notch being substantially perpendicular to the longitudinal axis of said jaws in their closed position, the land portions on one side of said notch being in abutting engagement in the closed position of said jaws, the other land portions being spaced from each other in the closed positions of said jaws thereby defining a gap extending from said notch to the tips of said jaws, whereby a clip may be fixedly secured to tapes extending through said gap into said notch.

2. In a plier type tool in accordance with claim 1 including shoulders on said jaws adjacent side faces of said jaws, said shoulders being coextensive with said notch and extending inwardly from the periphery of said notch for a distance substantially less than one-half of the minor diameter of said notch.

3. In a plier type tool in accordance with claim 2 in which the inner wall surface of one shoulder on each jaw is planar, and the inner wall surface of the other shoulder on each jaw being curved, with the planar surfaced shoulders being juxtaposed and the curved surfaced shoulders being juxtaposed when said jaws are in their closed position.

References Cited in the file of this patent

UNITED STATES PATENTS

<table>
<thead>
<tr>
<th>Patent Number</th>
<th>Inventor(s)</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>148,656</td>
<td>Blair</td>
<td>Mar. 17, 1874</td>
</tr>
<tr>
<td>304,089</td>
<td>Entrekin</td>
<td>Aug. 26, 1884</td>
</tr>
<tr>
<td>333,830</td>
<td>Conley</td>
<td>Jan. 5, 1886</td>
</tr>
<tr>
<td>499,638</td>
<td>Mellen</td>
<td>June 13, 1893</td>
</tr>
<tr>
<td>578,038</td>
<td>Hesterhagen</td>
<td>Mar. 2, 1897</td>
</tr>
<tr>
<td>1,361,338</td>
<td>Ketchum</td>
<td>Dec. 7, 1920</td>
</tr>
<tr>
<td>1,482,888</td>
<td>Converse</td>
<td>Feb. 5, 1924</td>
</tr>
<tr>
<td>1,704,999</td>
<td>Bashart</td>
<td>Mar. 12, 1929</td>
</tr>
<tr>
<td>1,848,763</td>
<td>Baringer</td>
<td>Mar. 8, 1932</td>
</tr>
<tr>
<td>1,924,837</td>
<td>Crause</td>
<td>Aug. 29, 1933</td>
</tr>
<tr>
<td>2,562,097</td>
<td>Heuer</td>
<td>July 24, 1951</td>
</tr>
</tbody>
</table>