Sept. 25, 1962 E. B. FERNBERG 3,055,103

METHOD OF MAKING SHEET METAL FASTENERS

Original Filed Oct. 2, 1957

2 Sheets-Sheet 1

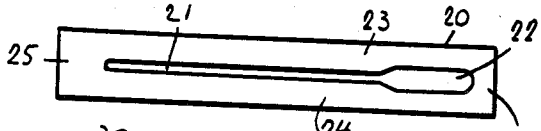


FIG. 1

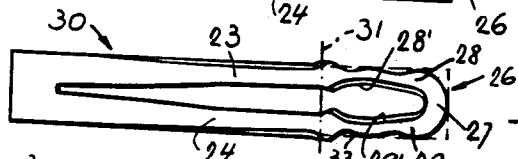


FIG. 2

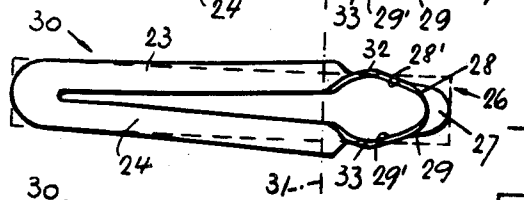


FIG. 3

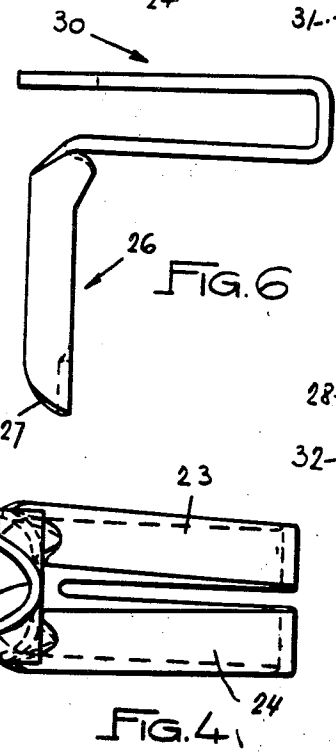


FIG. 6

FIG. 4

FIG. 5

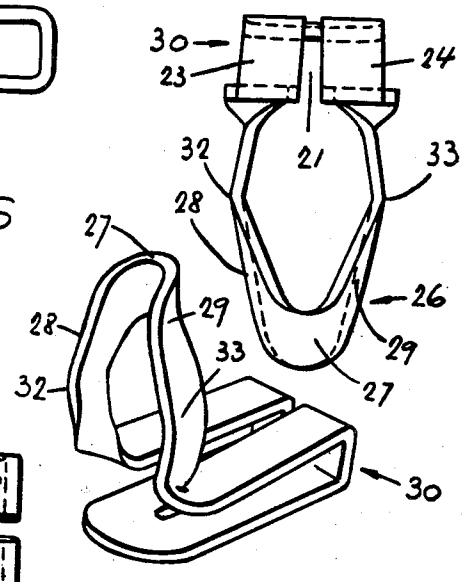


FIG. 7

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METHOD OF MAKING SHEET METAL FASTENERS

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2 Sheets-Sheet 2

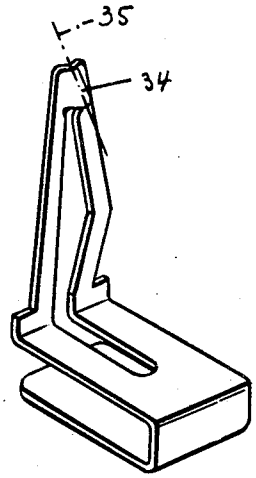


FIG. 8

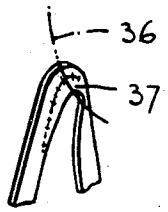


FIG. 9

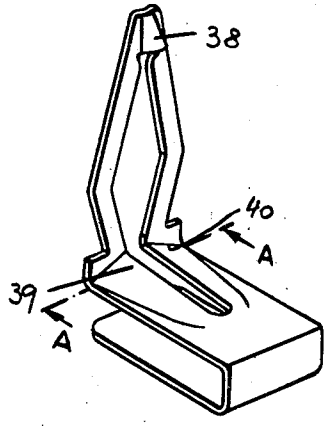


FIG. 10

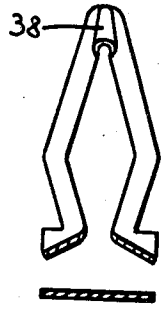


FIG. 11

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3,055,103

Patented Sept. 25, 1962

3,055,103

METHOD OF MAKING SHEET METAL FASTENERS

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Original application Oct. 2, 1957, Ser. No. 687,674, now Patent No. 2,966,711, dated Jan. 3, 1961. Divided and this application Dec. 11, 1957, Ser. No. 702,140

Claims priority, application Great Britain Oct. 4, 1956

3 Claims. (Cl. 29—549)

This invention relates to sheet metal fasteners but more particularly to the manufacture of such features.

An object is to produce a simple and efficient method of producing fasteners from a single strip of sheet metal in such manner that a substantial saving of material is effected as compared to current methods; resilient characteristics are selectively imparted to the ultimate fastener in a novel manner; and different size fasteners can be produced from a starting piece of the same width of sheet metal.

By way of illustration but not of limitation, embodiments of the invention are shown on the accompanying drawings in which:

FIGURES 1, 2 and 3 show three stages in shaping a blank to form a fastener;

FIGURES 4, 5, 6 and 7 are respectively a plan, front and side elevation and perspective view of the fastener formed from the blank of FIGURES 1 to 3, and

FIGURES 8 to 11 are illustrations of modifications of the invention, FIGURE 11 being a section on the line A—A of FIGURE 10.

At 20 in FIGURE 1 is shown a blank in the form of a rectangular strip of steel out of which has been punched an elongate hole 21. The hole lies along the length of the strip and is wider at one end 22 than the other. The hole leaves two arms 23 and 24 and two closed ends 25 and 26.

As shown in FIGURE 2, the next step in the process is, simultaneously or in sequence, to force apart the two arms 23 and 24, shear out the arms at the right hand end to the shape shown, and twist the arms.

The sheared-out right-hand end of the strip is to constitute a snap-engaging stud portion of the final fastener and henceforth therefore will be called a stud 26, having a closed nose 27 and two limbs 28 and 29.

The left-hand end of the strip is to constitute a base 30 of the finished fastener.

It will be seen that the arms 23 and 24 have maximum displacement at about the line 31, the original shape of the rectangular blank being shown in broken lines.

The two arms 23 and 24 are twisted in opposite senses. Those portions of the arms constituting the stud-limbs 28 and 29 have their inside edges pushed up from the plane of the paper, with respect to the outer edges, so that the narrow inside edges can be seen at 28′ and 29′ in the plan view of FIGURE 2.

Those portions of the arms 23 and 24 which lie in the base portion 30 adjacent the line 31, have their outside edges twisted upwardly from the plane of the paper.

The next step is illustrated in FIGURE 3. Here the twist of the stud limbs 28 and 29 has been increased until intermediate portions of the limbs are in approximately parallel planes which are perpendicular to the plane of the paper. Thus in the plan view of FIGURE 3 only the edges 28′ and 29′ can be seen at these intermediate positions. The two limbs have also been formed with opposed outwardly directed snap-engaging elbows 32 and 33, whilst the temporary twist in the arms 23 and 24 has been removed so that these portions are again flat and in the plane of the paper.

The strip is then bent, approximately at right angles, in the neighborhood of the transverse line 31 so that the stud 26 stands perpendicular to the base 30. Finally the base is bent twice at approximately right angles into the shape of a hook.

The final shape of the fastener is illustrated in FIGURES 4 to 7. After being thus formed the fastener is preferably rendered resilient and rust-proof in any convenient manner.

It can be seen that the hole 21 extends into the base 30 and around the web thereof. This feature of the fastener ensures high resiliency in the stud portion.

The resiliency of the stud is also enhanced by the bend in the nose 27 of the stud, this bend being about a line parallel with the plane containing the limbs of the stud.

The fastener may be used, in well known manner, to hold one member, such as a trim pad, to an apertured panel, the hook engaging an edge of (or a hole in) the pad and the stud snapping through the aperture in the panel.

Four important advantages accrue to the fastener described and its method of manufacture.

The first is that a very large saving of material is achieved as a result of the forcing apart of the limbs. One may start with a strip of given width and expand it to a width which may be up to as much as 50% greater.

The second is that the final dimensions of the stud can be adjusted by appropriately varying the extent to which the arms 23 and 24 and limbs 28 and 29 are forced apart. For a large panel aperture the limbs are forced further apart and for a small one are pushed only a little way apart.

Thus fasteners accommodating a range of panel aperture sizes can be produced from starting strip of the same width. The finished fasteners are usually wider than the starting strip.

The third advantage is that not only does the presence of the elongate hole afford great resilience in the fastener, but by choice of the length of the hole, the resilience can be adjusted.

The fourth advantage is similar to the first and arises from the bend in the nose 27 of the fastener, this bend increasing the resilience which can be given to the fastener.

In FIGURE 8 is shown a modified fastener in which the limbs have not been forced apart, but in which a bend 34 in the nose of the fastener is formed about a line 35 inclined a little to the plane containing the limbs. Nevertheless, the line about which bending occurs remains very approximately parallel to this plane. The elbow is formed in one limb only, and shoulders are formed at the roots of the limbs to limit the distance by which the stud enters a panel aperture.

As shown in FIGURE 9 the line 36 about which the bend 37 in the nose occurs is curved, remaining, however, approximately parallel to the plane containing the limbs.

The fastener illustrated in FIGURES 10 and 11 has a bend 38 in the nose similar to that of FIGURE 8 and in addition has those portions 39 and 40 of its arms lying in the stud twisted, in opposite senses, so that their inner edges are higher than their outer edges. The bend in the nose and the twist of the arms both increase the resilience of the fastener.

The bend in the nose of the fastener may be either convex or concave. Similarly the limbs of the fastener may have their bends of opposite sense to that described above.

This application constitutes a division of my copending application Serial No. 687,674, filed October 2, 1957 now Patent No. 2,966,711 and entitled "Fasteners."

What I claim is:

1. A method of making a one-piece snap fastener from a blank in the form of a single strip of flat material, comprising the steps of forming in the strip an elongate hole lying along the length of the strip so as to form two arms of material joined at their ends, increasing the distance between the two arms over at least an intermediate portion of their lengths to form at least one external elbow on one of the arms, bending the strip about a transverse line offset from the elbow so that one portion containing the elbow forms a snap-engaging stud and the other portion forms a base, and twisting the arms constituting the stud in opposite senses through approximately 90°, and bending the arms to form in the finished stud opposed outwardly directed snap-engaging elbows.

2. A method of making a one-piece snap fastener from a blank in the form of a single strip of flat material, comprising the steps of forming in the strip an elongate hole wider at one end lying along the length of the strip so as to form two arms of material joined at their ends, increasing the distance between the two arms and bending the strip about a transverse line so that the portion having the wider portion of the hole forms a resilient stud and the other a base, and twisting the arms constituting the stud in opposite senses through approximately 90°.

3. A method of making a one-piece snap fastener from a blank in the form of a single strip of flat material, comprising the steps of forming in the strip an elongate hole lying along the length of the strip so as to form two arms of material joined at their ends, increasing the distance between the two arms and bending the strip about a transverse line so that one portion forms a resilient stud and the other a base, twisting the arms constituting the stud in opposite senses through approximately 90°, and bowing the closed end of the strip forming part of the stud about a line which is approximately parallel with the plane of the strip.

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