Feb. 25, 1941. M. J. BERGEN 2,233,303

METHOD OF MAKING SCOOPS

Filed Nov. 18, 1938

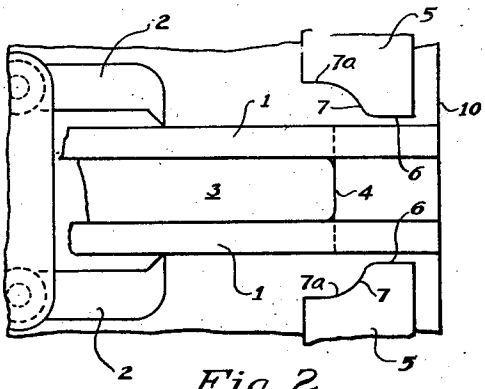


Fig. 2

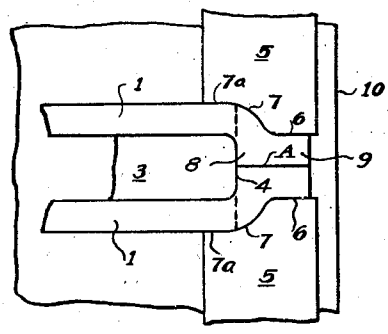


Fig. 3

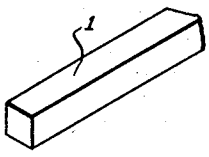


Fig. 1

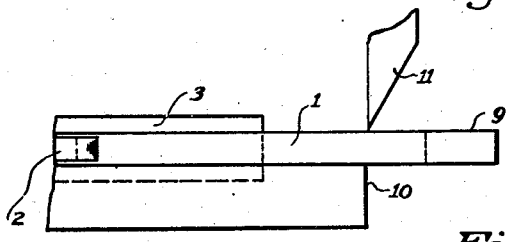


Fig. 4

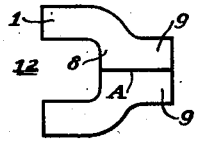


Fig. 8

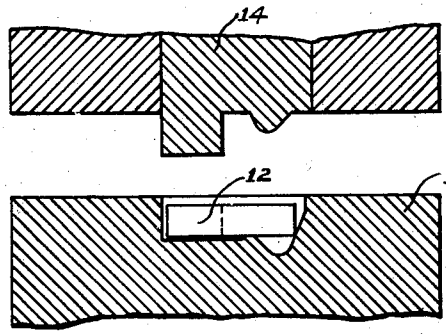


Fig. 5

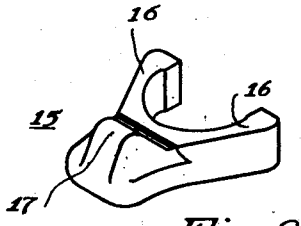


Fig. 6

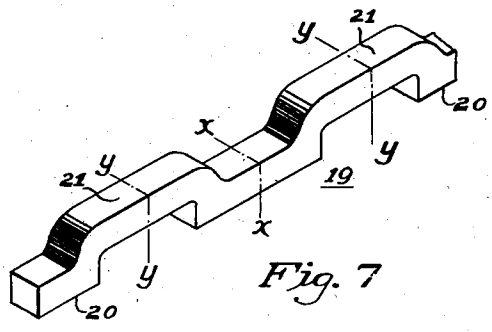


Fig. 7

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UNITED STATES PATENT OFFICE

2,233,303

METHOD OF MAKING SCOOPS

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Application November 18, 1938, Serial No. 241,272

7 Claims. (Cl. 29—148)

This invention relates to slide fasteners of the type having interlocking elements or scoops mounted on opposed stringers or tapes and movable into and out of locking engagement by a slider, and particularly to an improved method of making the individual interlocking elements or scoops.

The principal object of this invention is to provide a method for making the interlocking elements or scoops of a slide fastener from metal stock without waste or the loss of any material as scrap, and which is economical, easy to carry out and which does not require any elaborate or expensive machinery to practice the invention.

Another object is to produce the interlocking elements or scoops of a slide fastener from standard or commercial gauge wire stock of standard shape and size in cross section, wherein the step of rolling or drawing the wire stock to any definite cross sectional configuration or shape, as must now be done in the only process known to me for making such scoops without waste or scrap loss, is omitted.

These and other objects which will hereinafter be made apparent to those skilled in this particular art are accomplished by means of this invention, the steps of my improved method being described in the following specification and diagrammatically illustrated in the accompanying drawing, wherein:

Figure 1 is a perspective view illustrating the preferred shape of a length of wire stock used in carrying out my invention;

Fig. 2 is a plan view illustrating diagrammatically the blank forming mandrel along the sides of which two lengths of wire stock are simultaneously fed;

Fig. 3 is a view similar to Fig. 1 but showing the ends of the wire stock bent around the front end of the mandrel;

Fig. 4 is a side elevation illustrating the step of severing a formed blank from the lengths of wire stock;

Fig. 5 is a sectional view showing a die for receiving the severed blanks and in which the severed blanks are coined to form finished interlocking elements or scoops;

Fig. 6 is a perspective view of a completed interlocking element or scoop;

Fig. 7 is a perspective view showing the shape of another length of wire stock which may be used in carrying out my invention; and

Fig. 8 is a plan view of the blank from which the scoops are coined.

Broadly, my improved method of making interlocking elements or scoops for slide fasteners consists in forming from two lengths of wire stock, a substantially U-shaped blank with the ends of the two lengths of wire projecting a short distance beyond the base of the blank. The formation of the blank is completed by welding these projecting ends together in any suitable or desired manner, such as by spot welding. The blank so formed is then subjected to a coining operation to form from the welded portion thereof an interlocknig head having a recess on one side and a projection on the opposite side thereof, and at the same itme to shape and form from the legs of the U-shaped blank a pair of spaced tape-gripping jaws for clamping the finished scoop or interlocking element to the edge of a tape or stringer. No special equipment or machinery is needed to practice my invention and it may be readily carried out and practiced with the aid of standard apparatus or equipment now in general use.

In the preferred form of my invention, two lengths of wire stock 1, arranged in parallel relation to each other, are simultaneously and intermittently fed forward by a pair of reciprocating wire feeders, indicated at 2, of conventional construction and operation, and moved along the sides of a suitable shaping or forming mandrel 3 having an insulated front face 4. The wire feeders 2 are so arranged and adjusted that each forward movement thereof moves the ends of the lengths of wire stock a predetermined distance beyond the front face 4 of the mandrel.

The term "length of wire stock," as used herein, means the stock lying along each side of the mandrel and extending through the feeding means, and it is to be understood that I am not limited to any particular length of wire but that wire coiled on reels may be readily used in carrying out my improved process.

The projecting ends of the wire stock are then bent toward each other at substantially right angles around the front face 4 of the mandrel. The ends of the length of wire stock are of sufficient length and extend beyond the front face 4 of the mandrel a sufficient distance so that when bent toward each other a portion of each wire forms a split base of a substantially U-shaped blank, and the ends of the wires project a short distance therebeyond and lie in a plane substantially parallel to the sides of the mandrel 3. The ends of the two wires are then united by welding.

In the drawing, I have indicated a pair of opposed welding presses 5, each having a flat exposed face 6 and a curved face 7, a portion 7a of

which is insulated for bending the ends of the wires 1 around the mandrel 3, and which are adapted to be periodically moved toward and away from each other and into and out of engagement with the projecting ends of the wire stock. The presses 5 are so arranged and positioned on each side of the mandrel 3 that as they move into engagement with the projecting ends of the wires 1, the curved portions 7 bend the wires around the front face of the mandrel 4 to form the base 8 of a U-shaped blank having a portion 9 extending a short distance therebeyond, which is formed from the bending pressure exerted on the extreme outer ends of the wire by the face 6. The welding presses 5 are preferably of the electrical resistance type and as soon as the ends of the wire 1 have been bent around the mandrel 3 and while the presses are still in engagement therewith, the exposed faces 6 and 7 of the welders are connected to a source of current and the two wires are welded or united together along the line "A".

After the welding operation has been completed, the presses 5 are moved away from the mandrel 3 and the feeders 2 are again operated to feed the wires along the mandrel and move the base 8 of the U-shaped blank a predetermined distance beyond the edge of a cut-off block 10. With the blank in this position, the wires 1 are severed by a suitable knife or shear, indicated at 11, which operates in conjunction with the cut-off block 10, and a U-shaped blank 12 is thus produced from which the fastener element or scoop is formed.

To complete the formation of the interlocking element or scoop, each blank 12 is transferred or conveyed to and positioned in the female member 13 of a suitable coining die of the usual type used in this industry and having a male member 14 cooperating therewith. When the sections 13 and 14 of the die are brought together, the blank 12 is coined and a fastener element 15 having a pair of spaced tape-gripping jaws 16 at one end and an interlocking head 17 of the usual shape and size is produced.

The scoops 15 after leaving the coining die may be placed in a hopper which feeds them one at a time to a mechanism for clamping the tape-gripping jaws 16 to a suitable tape or stringer, or each individual scoop 15 may be conveyed directly from the coining die to the mechanism for clamping the jaws to the tape, if desired.

Fig. 7 illustrates another form of wire stock which may be used in carrying out my process for making scoops. In this figure, the length of wire stock 19 is preformed to provide a series of longitudinally spaced flat sections 20 which are separated from each other by off-set sections 21. To make scoops from wire of this general shape, two lengths of wire stock are placed in side by side relation with the surfaces 20 on one length abutting against the surfaces 20 on the other length. With the lengths of stock in this position, the surfaces 20 are spot welded together, after which the lengths of wire stock are severed on the lines X—X and Y—Y to form individual blanks which are then coined to produce the fastener elements or scoops 15.

If desired, the blank may be formed by first severing the length of wire 19 on the lines X—X and Y—Y and then arranging the severed pieces in such a way as to form substantially U-shaped members with the surface 20 on one piece in contact with the surface 20 on the other piece, after which the contacting surfaces 20 are welded together by any appropriate welding means to provide an integral blank.

While I have described one embodiment of my invention and indicated mechanisms, which may be used in carrying out such improved method, it is to be understood that my method is not limited to the particular arrangement of steps set forth nor to the mechanisms indicated, but that certain modifications, changes, additions, subtractions and omissions may be made therein, and other apparatus and mechanism may be used, without departing from the spirit of my invention or the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. The method of making scoops from wire stock which consists in positioning a pair of wires along the sides of a mandrel with the ends thereof projecting a predetermined distance beyond the end thereof, bending the projecting ends around the mandrel and forming flat contacting surfaces on the ends of said wire to provide a substantially U-shaped blank having a split base and legs of indeterminate length, welding the contacting surfaces of said wires together, moving the wires forward along the sides of said mandrel, severing the wires at a point a predetermined distance beyond the front of said mandrel to secure a blank, and then coining said blank to form a scoop.

2. The method of making fastener elements of the type having pronged attaching portions adapted to straddle a stringer, and free interlocking heads, having interlocking recesses and projections on opposite sides thereof, which consists in offsetting separate lengths of wire stock to provide, when two such lengths are placed side by side, a substantially U-shaped blank, having a portion of each wire projecting beyond the base of said blank in a plane substantially parallel to the legs thereof, welding the projecting portions of said wires together and then simultaneously shaping the legs of said blank to form the pronged attaching portions and indenting said welded portion to provide on the interlocking head of the scoop having a recess on one side and a projection on the other side.

3. The method of making scoops or fastener elements of the type having pronged attaching portions adapted to straddle a stringer, and free interlocking portions, having interlocking recesses and projections on opposite sides thereof, which consists in placing two lengths of wire, each having an offset therein, side by side, with the offset portions of each wire in contact with each other, welding the contacting offset portions of said wires together to form a substantially U-shaped blank, having a portion projecting beyond the base thereof, and then shaping the legs of said blank to form the pronged attaching portions and indenting the portion projecting beyond the base of said blank to form the interlocking portion with a recess and projection on opposite sides thereof.

4. The method of making scoops or fastener elements of the type having pronged attaching portions adapted to straddle a stringer, and free interlocking portions having interlocking recesses and projections on opposite sides thereof, which consists in forming a blank from wire stock by welding the ends of two lengths of wire stock together while holding the remaining portions of the wires spaced apart and out of contact with each other, and then indenting the welded

portion of said blank to form the interlocking portion having a recess on one side and a projection on the other side thereof, and shaping the spaced apart portions of said blank to form the pronged attaching portions of said scoop.

5. The method of making scoops or fastener elements of the type having pronged attaching portions adapted to straddle a stringer, and free interlocking heads having interlocking recesses and projections on opposite sides thereof, which consists in arranging two wires of an indeterminate length in parallel relation to each other, bending the free end of each wire to provide an offset therein, welding the offset ends of said wires together, severing each of said wires, to provide a substantially U-shaped blank, with the welded portion thereof projecting beyond the base of the blank and then shaping the legs of said blank to form the pronged attaching portions of a scoop, and indenting the projecting welded portion thereof to form an interlocking head having a recess on one side and a projection on the opposite side thereof.

6. The method of making scoops or fastener elements of the type having pronged attaching portions adapted to straddle a stringer, and free interlocking heads, having interlocking recesses and projections on opposite sides thereof, which consists in placing two wires of indeterminate lengths along the sides of a mandrel, having parallel sides with the ends thereof projecting beyond the face of said mandrel a distance greater than the width of said mandrel, bending the projecting ends of the wires around the face of said mandrel to provide an offset in each of said wires, and bring the ends thereof into contact with each other, spot welding the contacting ends of said wires together, feeding said wires forwardly along the sides of said mandrel, severing said wires at a point beyond the face of said mandrel to provide a substantially U-shaped blank, having a portion projecting beyond the base thereof and then simultaneously shaping the legs of said blank to form the pronged attaching portions of the scoop and indenting the projecting portion of said blank to form the interlocking head having a recess on one side and a projection on the other side thereof.

7. The method of making scoops or fastener elements of the type having pronged attaching portions adapted to straddle a stringer, and free interlocking heads having interlocking recesses and projections on opposite sides thereof, which consists in placing a pair of wires of indeterminate length along the sides of a mandrel, with the ends thereof projecting a pre-determined distance beyond said mandrel, subjecting the projected ends of said wires to a bending pressure to form an offset in each of said wires and to move the offset ends thereof into contact with each other, welding the contacting ends of said wires together, feeding said wires forward along the sides of said mandrel a pre-determined distance, severing said wires at a pre-determined distance beyond the end of said mandrel, to provide a substantially U-shaped blank having a portion projecting beyond the base thereof, shaping the legs of said blank to form the pronged attaching portions of the scoop and indenting and shaping the projecting portion of said blank to form the interlocking head having a recess on one side and a projection on the other side thereof.

MARTIN J. BERGEN.