

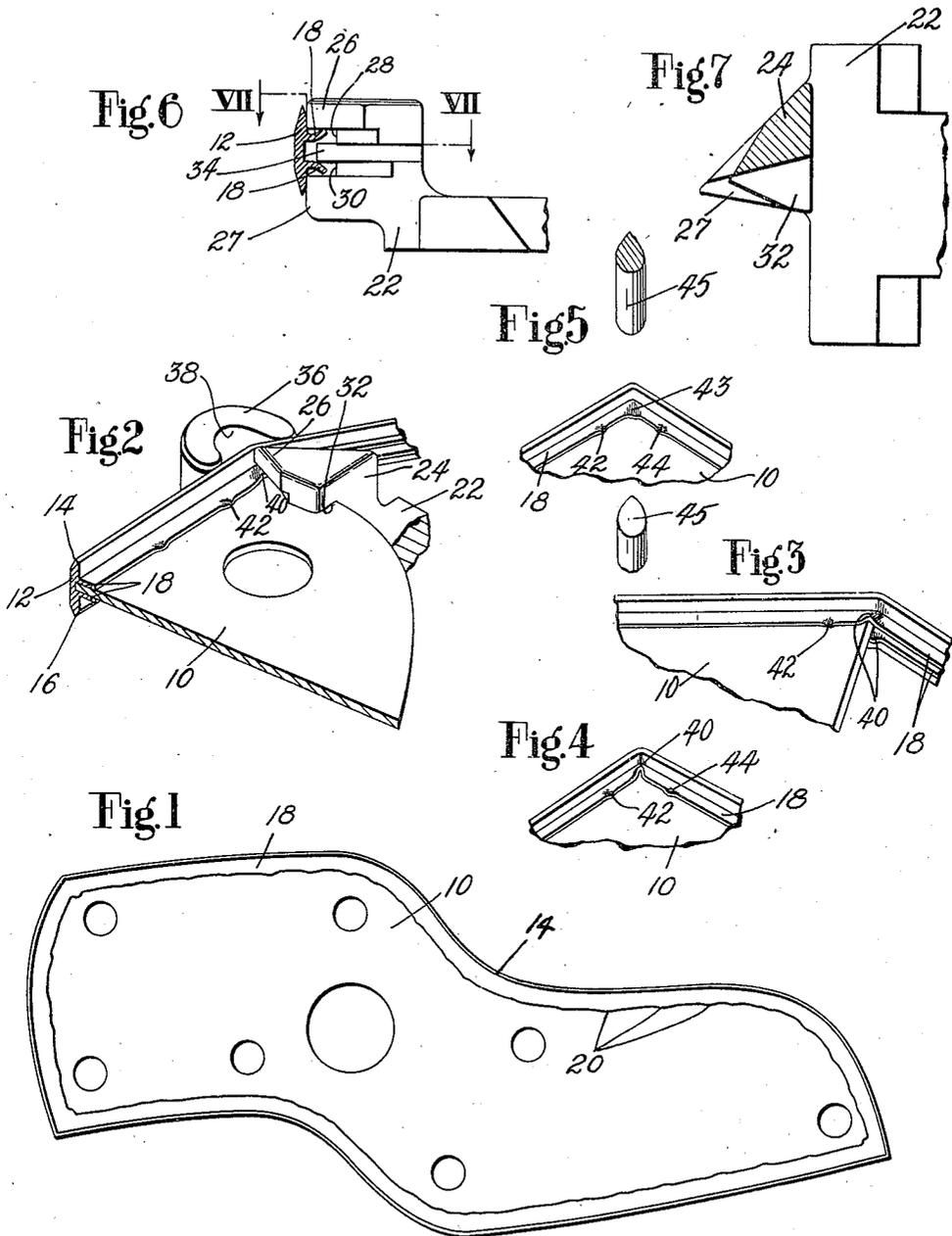
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2,281,587

METHOD OF MAKING CUTTING DIES

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METHOD OF MAKING CUTTING DIES

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3 Claims. (Cl. 76—107)

This invention relates to methods of making cutting dies and is herein illustrated in connection with a die, suitable for use in cutting shoe part blanks, of the type illustrated in United States Letters Patent No. 2,124,676, granted July 26, 1938, upon an application filed in the name of George Ryan.

Dies of the type referred to usually comprise a metal core and a double-edged blade having two laterally projecting flanges, which are bent along the edge of the core and secured to opposite faces thereof. Such dies have gone into extensive use and have been satisfactorily employed in cutting large numbers of shoe-part blanks of various kinds.

It is an object of the present invention to produce an improved cutting die, in which the corner portions thereof will be especially strong to adapt them to resist forces tending to break the die at such corner portions. To this end, and as illustrated, my invention contemplates the provision of a die having a core, and a blade extending along the periphery of the core and having a continuous flange in engagement with the core along the corner thereof. The continuous flange acts to reinforce the blade along corner portions of the die, with the result that likelihood of breakage of the die at such portions during pressure-applying operations is reduced to a minimum.

In view of the foregoing, the invention provides a novel method of producing a die of the type referred to, in which a flanged blade is bent along the periphery of the core, and when a corner portion of the core is encountered the flange portion of the blade is swaged to form a loop or loops projecting from the surfaces of the core at the corner, and the flange is successively secured to the core at various points along the periphery thereof, after which the loop or loops are flattened, thus to form a die having a continuous flange secured to a core along the corner portions thereof. Preferably and as shown, the blade stock is secured to the core by spot welding the flange of the blade to the core, and the swaged portion of the flange is flattened by spot welding the flange at the corner of the die.

These and other aspects of the invention will be apparent from the following detailed specification, when taken in connection with the accompanying drawing, and are pointed out in the appended claims.

In the drawing,

Fig. 1 is a plan view of a die construction in accordance with my invention;

Fig. 2 is a perspective view illustrating the step of bending the blade about a corner portion of the core of the die;

Fig. 3 is a perspective view illustrating a portion of the core with the blade stock partially bent about the corner;

Fig. 4 is a perspective view of a corner portion of the die after the blade stock has been bent about the corner and secured to the core;

Fig. 5 is a perspective view of a corner portion of the die after the loops have been flattened, showing electrodes for performing the operation;

Fig. 6 is a view in side elevation of a portion of a bending tool with blade stock, shown in cross section, in engagement with the tool; and

Fig. 7 is a view, partly in cross section, of the bending tool looking in the direction of the arrows VII—VII of Fig. 6.

Fig. 1 illustrates a die, constructed in accordance with my invention, and comprising a core 10 corresponding in size and shape to a quarter blank to be cut by the die and a blade 12 bent along the periphery of the core. As shown in Fig. 2, the blade 12 has oppositely disposed cutting edges 14 and 16, and laterally projecting flanges 18 arranged to engage opposite faces of the core 10 and which are secured thereto by spot welding, successive welds being indicated in Fig. 1 by reference character 20. In forming the die, the blade stock is bent along the peripheral portion of the core, using the flanges as guides in positioning the core with its edge in contact with the bottom of the recess in the blade formed between the flanges, and the flanges are secured to the surfaces of the core by spot welding at intervals along the periphery thereof. A more complete description of the method of forming the die, as thus far set forth, is to be found in the specification of the aforementioned Letters-Patent.

In bending the blade stock about the corner portions of the die, use is made of a bending tool 22, illustrated in Figs. 2, 6 and 7. This tool comprises a tapered head 24 having nose portions 26 and 27 which are arranged to engage the blade stock upon opposite sides of the flanges 18, the head being recessed at 28 and 30 to provide clearance for the flanges. The head 24 is also provided with a slot 32 for receiving the edge of the core 10 when the tool is in engagement with the blade stock. The head 24 is also provided with a guide 34 adapted to enter the space between the flanges 18 and the blade stock in locating the stock relatively to the tool. The tool is used in conjunction with a stationary supporting mem-

ber 36, having a U-shaped recess 38, the walls of which provide means for cramping the blade stock against the tool, when the latter is forced into the recess, thereby to bend the free end of the blade stock about the nose portions 26 and 27 of the tool in forming the corner of the die. As the blade stock is bent about the corner of the core, as shown in Figs. 2 and 3, the flanges 18 are deformed by being bent or swaged outwardly forming loops 40 extending outwardly from the core. Fig. 3 shows the die with the blade secured to the core adjacent to the corner of the core 10 by a spot-weld 42 and the free end of the blade partly bent around the corner forming the loops 40.

Fig. 4 shows the corner portion of a die after the blade has been bent completely about the corner of the core 10. It is to be noted that the blade is secured to the core by a second spot-weld 44 which was made after the flanges of the blade had been swaged and the blade bent around the corner.

After the blade stock is bent completely around the die and temporarily secured thereto by a few spot-welds, such as welds 42 and 44, the ends of the blade stock are butt welded together in the usual manner, after which the flanges are further secured to the core by spot welding along the flanges at frequent intervals, as indicated by reference character 20 (Fig. 1).

At any convenient time after the blade has been bent around a corner or corners of the die, the loops 40 are flattened out as indicated at 43, Fig. 5, preferably by spot welding at the corner of the die by means of electrodes 45, the effect of the heat and pressure of the electrodes used being to flatten and melt the material of the loops to such an extent that they form parts of continuous flanges extending past the corner portion of the die.

It is to be noted that by forming dies in the manner just described no material is removed from the flanges at the corners, with the result that the corner portions of the die are as strong as other portions thereof, and in fact, due to the placement of material caused by the looping and

flattening of the flanges in the narrow spaces at the corners, the blade at the corner portions is additionally reinforced against breakage.

Having described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A method of forming a cutting die having a corner, which consists in providing a core of a shape corresponding to a blank to be cut and a shape having a laterally projecting flange, bending the blade along the core with the flange in engagement with a surface thereof, securing the blade to the core at a point adjacent to the corner, bending the free end of the blade about the corner to form a loop in the flange at the corner, securing the free end of the blade to the core adjacent to the corner, and applying pressure and heat to the loop to flatten and melt the metal of the loop to form a continuous flange reinforced at the corner portion of the die.

2. A method of forming a cutting die having a corner, which consists in providing a core of a shape corresponding to a blank to be cut and a blade having a laterally projecting flange, bending the blade along the core with the flange in engagement with a surface thereof, bending the free end of the blade about the corner to form a loop in the flange at the corner, applying pressure and heat to the loop to flatten and melt the metal of the loop to form a continuous flange, and welding the flange to the core at the corner portion of the die.

3. A method of forming cutting dies, which consists in providing a metal core and a blade having a laterally projecting flange, bending the blade along the core with the flange in engagement with the core adjacent to a corner thereof, welding the flange to the core at a point adjacent to the corner, bending the free end of the blade about the corner to form a loop in the flange adjacent to the corner, welding the free end of the blade to the core adjacent to the corner, and applying pressure and heat to the loop to flatten and melt the metal of the loop thereby forming a continuous flange past the corner.

HAROLD A. M. LATHAM.

CERTIFICATE OF CORRECTION.

Patent No. 2,281,587.

May 5, 1942.

HAROLD A. M. LATHAM.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, second column, line 10, claim 1, for "shape" read --blade--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 7th day of July, A. D. 1942.

Henry Van Arsdale,
Acting Commissioner of Patents.

(Seal)