April 21, 1964 J. O. LOWELL 3,129,623

PLURAL DIE ELEMENTS SURROUNDED BY SINGLE STRIPPER PAD MEANS WITH WORK GAUGE OVERLYING STRIPPER

Filed July 3, 1956 2 Sheets-Sheet 1

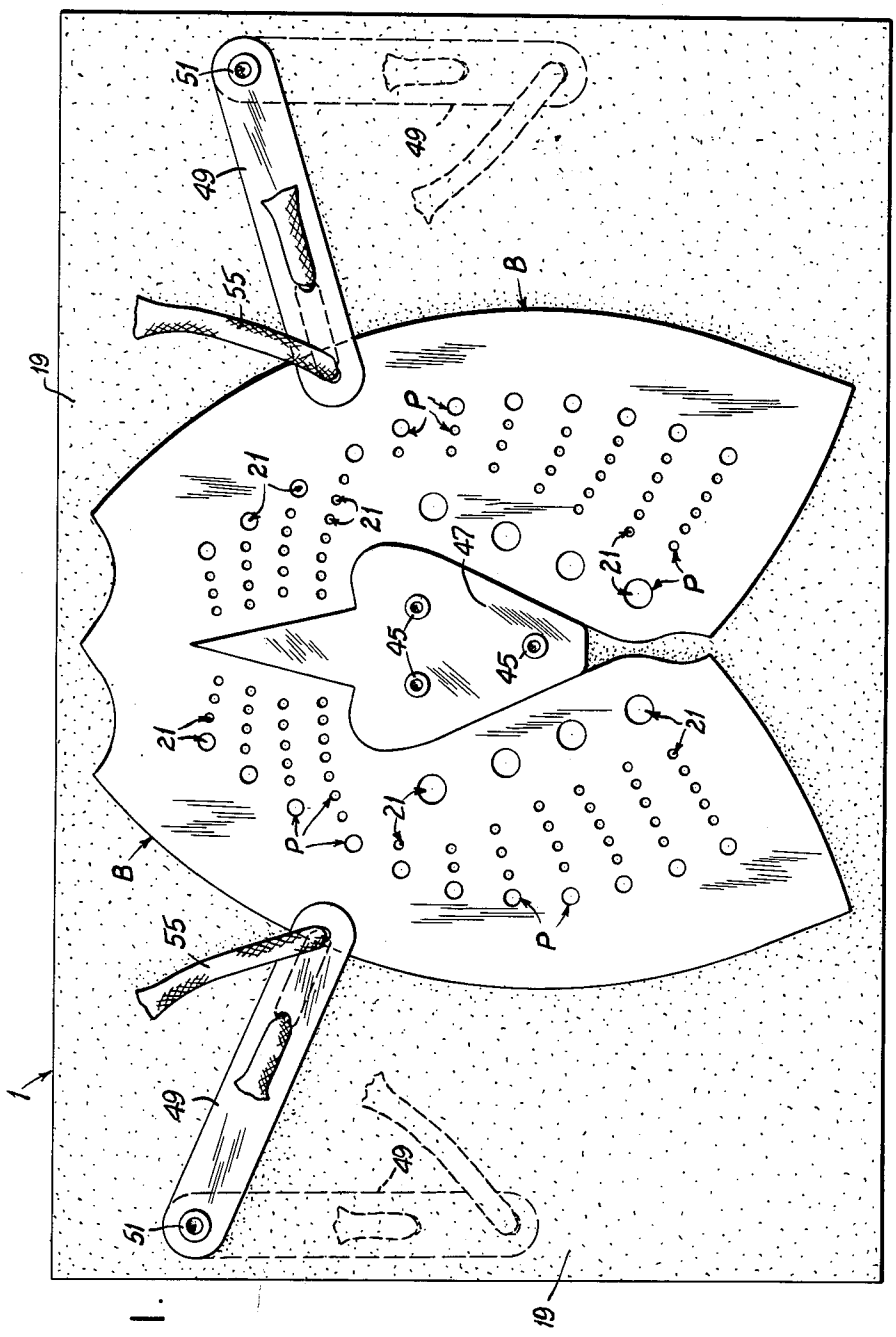


FIG. 1.

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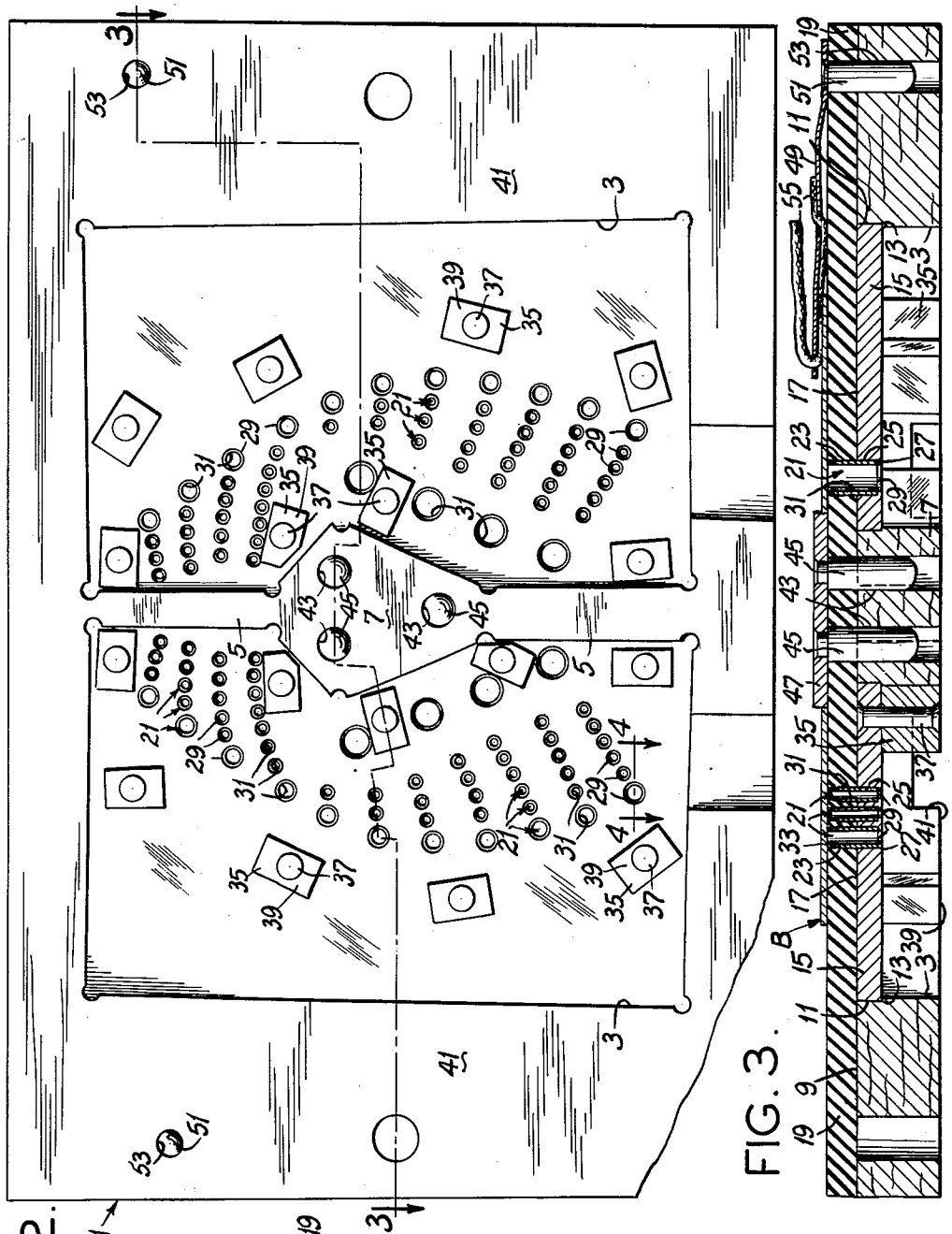


FIG. 2.

FIG. 3.

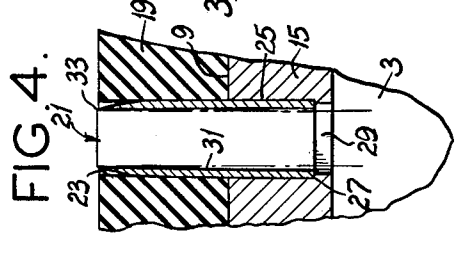


FIG. 4.

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United States Patent Office 3,129,623 Patented Apr. 21, 1964

3,129,623

PLURAL DIE ELEMENTS SURROUNDED BY SINGLE STRIPPER PAD MEANS WITH WORK GAUGE OVERLYING STRIPPER

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Filed July 3, 1956, Ser. No. 595,763
1 Claim. (Cl. 83—133)

This invention relates to dies, and more particularly to dies such as are used for perforating and trimming blanks of leather or other material used for shoe uppers or other parts of shoes.

Among the several objects of the invention may be noted the provision of a die of the class described having means for clamping a blank of material on the face of the die with this clamping means of such construction as to facilitate the removal of blanks from the die and the application of blanks to the die; the provision of a perforating die of the class described which is of such construction as to allow for close spacing of perforating elements without preventing the continuous removal of waste from the perforating elements; and the provision of a die having the stated features which is economical to manufacture. Other objects and features will be in part apparent and in part pointed out hereinafter.

The invention accordingly comprises the constructions hereinafter described, the scope of the invention being indicated in the following claim.

In the accompanying drawings, in which one of various possible embodiments of the invention is illustrated,

FIG. 1 is a plan view of a perforating die of this invention with a blank on the die, the blank being shown with the pattern of perforations made therein by the die;

FIG. 2 is a bottom plan of FIG. 1;

FIG. 3 is a cross section taken on line 3—3 of FIG. 2; and,

FIG. 4 is an enlarged fragment of FIG. 3.

Corresponding reference characters indicate corresponding parts throughout the several views of the drawings.

Referring to the drawings, a die of this invention is shown to comprise a base 1 constituted by a rectangular block of wood having two openings 3 therein (see FIGS. 2 and 3). These openings are separated by a portion of the block designated 5 which forms a bridge extending from one long side of the block to the other. This bridge 5 has a widened central portion 7. The edge of each of the openings 3 at the upper face 9 of the block is rabbeted or grooved as indicated at 11 thereby providing a shoulder 13. A metal plate 15, of a thickness corresponding to the depth of the rabbet or groove 11 and of less thickness than the block 1, is set into the rabbet or groove 11 in each of openings 3 bearing against the shoulder 13, with the upper face 17 of each plate flush with the upper face 9 of the block and with the bottom surface of each plate above the bottom of the block so that there is a space below each plate.

A resilient mat 19, preferably made of rubber, covers the upper face 9 of the block and the upper face 17 of each of the plates 15. This mat constitutes a work support and stripper. Each plate 15 has a plurality of tubular perforating die elements 21 projecting therefrom through openings 23 in the mat. Various sizes of die elements 21 are shown. Each die element is fitted in a socket 25 formed in the respective plate 15. Each socket 25 is formed with an upwardly facing annular shoulder 27. The lower end of the die

element 21 bears against this shoulder. Below this shoulder there is an opening or hole 29 in the plate 15 which is of somewhat smaller diameter than the socket 27 but larger than the internal diameter of the die element at the lower end of the die element. The die element preferably has a tapered bore 31 which diverges in the direction toward the upper cutting end 33 of the die element, as indicated by the dot-dash lines in FIG. 4. This end of the die element is generally flush with the outer face of the mat 19.

Each plate 15 has fastened to its underside a plurality of supporting members constitued by metal blocks 35. Each of these may be fastened to the plate by a rivet as indicated at 37. The bottom faces 39 of the blocks 35 are generally flush with the bottom face 41 of the base block 1. The mat 19 and the widened central portion 7 of the bridge 5 are provided with a plurality of openings 43 (three being shown) for the reception of pins 45 which extend from the bottom of a metal gauge plate 47. This plate rests on top of the mat 19 and is shaped and located for positioning a blank B in the proper position relative to perforating elements 21 for being perforated. The gauge plate 47 shown in the drawings may be removed and replaced by a gauge plate of different shape for a blank of different shape.

For clamping the blank B on the face of the mat 19, I provide spring clamp members 49, one at each side of the die. Each clamp member 49 comprises a spring blade having a pin 51 at one end frictionally received in an opening 53 in the mat 19 and base block 1. The blade 49 lies flat on the mat. Secured to each blade is a cord 55 which may be grasped to bend the blade upward and to swing the blade into and out of engagement with a blank B.

In use, a blank B (such as a preformed leather blank) is placed on the upper face of the mat 19, being located in the proper position in respect to the perforating die elements 21 by means of the gauge plate 47. The spring blades 49 may be rotated to a position such as shown in dotted lines in FIG. 1 to permit this. The pins 51 are rotary in the openings 53 to permit the swinging of the blades. Then, the blades are lifted by means of the cords 55, swung over the blank to a position such as shown in solid lines in FIG. 1, and released for clamping the blank on the mat.

The die with the blank clamped thereon is placed on the bed of a press (not shown) having a head plate which is movable down into engagement with the upper cutting ends 33 of the die elements 21, and the press is operated to move the head plate down. The mat 19 yields under the pressure of the head plate. The cords 55 sink into the mat and do not interfere with the perforating operation. The engagement of the head plate with the cutting ends of the die elements results in the perforation of the blank with the attendant cutting out of small circular pieces of the bank. These drop out through the tubular die elements 21 and the openings 29 in plates 15 into the spaces provided below the plates 15. The taper of the bore 31 in the die elements and the provision of the openings 29 of larger diameter than the diameter of the bore insures free disposal of this waste. The blocks 35 support the plates 15 under the load imposed by the head plate of the press.

FIG. 1 shows the blank B with the perforations P made therein as a result of the perforating operation. It will be understood that upon raising the head plate of the press, the resilient mat 19, being relieved of compression, expands to its original thickness and strips the perforated blank from the die elements 21. Then,

the cords 55 are grasped, and the spring blades 49 are bent up and swung aside, and the blank is removed.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As various changes could be made in the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:

A die comprising a base having two openings therein, a bridge between the openings, two rigid plates smaller than and of less thickness than the base, and of a shape to engage the sides of the openings and to be positioned thereby, the plates being removably inserted in said openings, at least one tubular die element mounted in each plate, means limiting the movement of the plates in the openings to locate them with their upper faces generally flush with the upper face of the base and their bottom faces above the bottom of the base; stripper means in the form of cushion pad material of uniform thickness mounted on and covering the flush upper faces of the base, the bridge, and the two plates, and having openings through it to receive the die elements on the two plates, the die elements projecting from the plate through the openings in the stripper means, and a work gauge removably mounted on the bridge above the stripper pad.

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