Dec. 13, 1932. A. W. ALTVATER 1,890,715

UNITARY DIE ASSEMBLY

Filed June 9, 1930

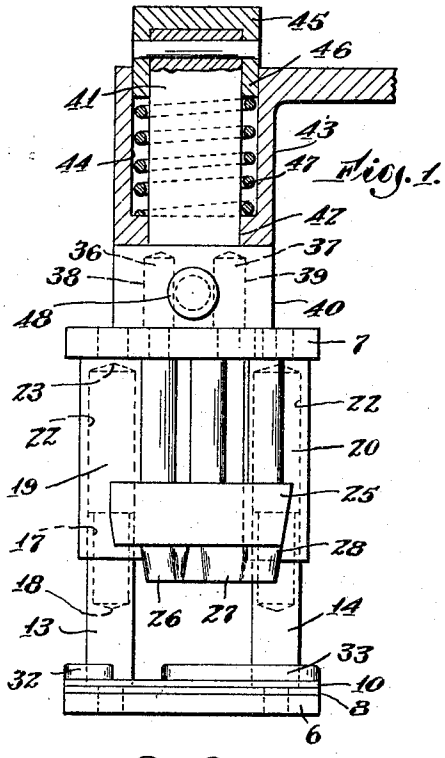


Fig. 1.

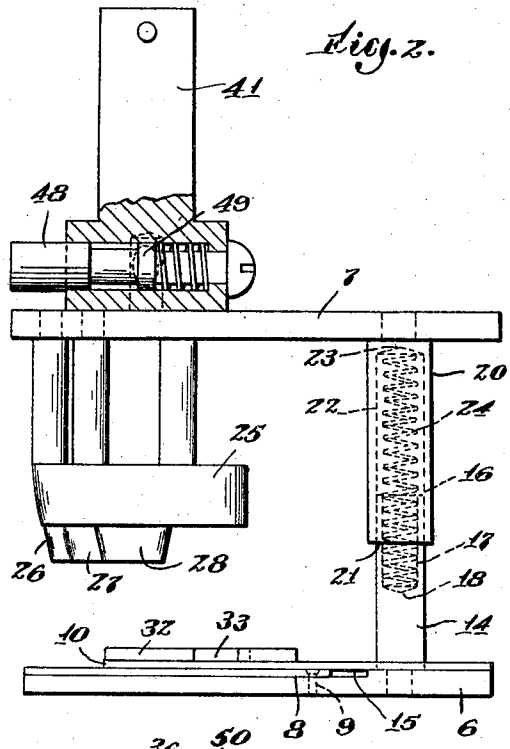


Fig. 2.

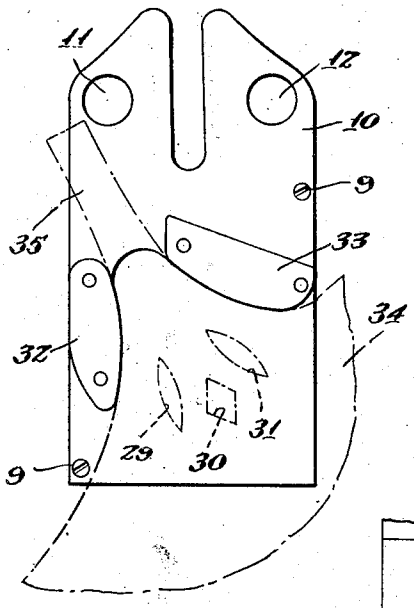


Fig. 3.

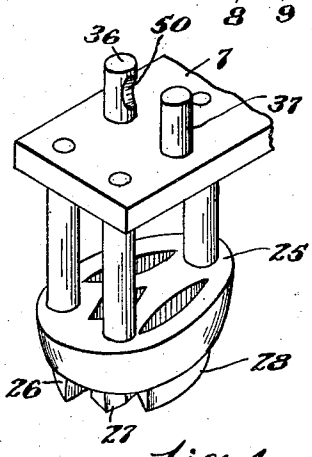
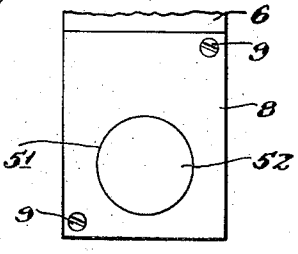


Fig. 4.

Fig. 5.



Inventor:
Arthur W. Altvater
by Charles W. McDermott
his attorney

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UNITED STATES PATENT OFFICE

ARTHUR W. ALTVATER, OF UNIVERSITY CITY, MISSOURI, ASSIGNOR TO WESTERN SUPPLIES COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI

UNITARY DIE ASSEMBLY

Application filed June 9, 1930. Serial No. 460,082.

The present invention relates to the art of forming perforations such, for instance, as ornamental cut-outs in shoe upper blanks, which term includes within its scope, vamps, quarters, tips and straps.

In using one type of machine for forming ornamental cut-outs it is necessary to have on hand available for use therein a large number of interchangeable dies, interchangeable gages and interchangeable striking plates. When a gage is used it must be associated with a particular one of the interchangeable dies. Initially any one of the striking plates may be used with any one of the interchangeable dies, but after a particular striking plate has been used once with a particular one of the interchangeable dies the said striking plate should be reused only with the said die. After a die and its gage and striking plate have been used to cut out a particular design in a lot of shoe upper blanks the die, gage and striking plate are removed from the machine for storage until again needed for use in forming the particular design in a similar lot. Heretofore, when the die and its gage and striking plate were removed from the machine they constituted separate pieces. Notwithstanding that great care was taken to store the cooperating die, gage and striking plate in disuse so that they could be readily identified for reassembly in the cut-out forming machine, they were liable to become mingled with the other dies, gages and striking plates. When this occurred considerable trouble was experienced owing to the difficulty in selecting the proper die, gage and striking plate from the commingled ones. Serious loss often resulted as it was easy to make a mistake and assemble in the machine the wrong cooperating elements. Moreover, it was easy to lose or mislay one of the needed parts thus necessitating expense and delay in obtaining and waiting for a duplicate.

The principal object of the present invention is to produce an assembly of the cooperating interchangeable elements of a cut-out machine, such for instance, as a die and the striking plate therefor, or a die and its gage, or a die and its gage and striking plate, or it may be, a gage and a striking plate, for use and for storage in disuse as a unit.

To the accomplishment of this object, and such others as may appear hereinafter, the various features of the present invention reside in certain devices, combinations and arrangements of parts hereinafter described and then set forth broadly and in detail in the appended claims which possess advantages readily apparent to those skilled in the art.

The various features of the present invention will be readily understood from an inspection of the accompanying drawing, illustrating the best form of the invention at present known to the inventor, in which,

Figure 1 is a view in front elevation showing the assembly of the die, gage and striking plate secured to the die holder of a machine for forming ornamental cut-outs in shoe upper blanks;

Fig. 2 is a view in side elevation, the die holder of the machine being separated from its carrier;

Fig. 3 is a detail view in plan of the assembled gage and die striking plate, the posts on their supporting plate being removed to show the openings in the gage plate;

Fig. 4 is a detail view in perspective of the die, and

Fig. 5 is a view in plan of a modified form of the die striking plate assembled on its supporting plate.

In the illustrated embodiment of the invention the assembly of the cooperating interchangeable elements such, for instance, as a die, gage and die striking plate for a machine for forming ornamental cut-outs in shoe upper blanks comprises two flat plates 6 and 7 (Figs. 1 and 2). The die striking plate 8 is secured removably to the plate 6 by two screws 9, the rear one being shown in Fig. 2 and both being shown in Fig. 3. Superimposed upon the die striking plate 8 is a flat gage plate 10 provided with openings 11 and 12 (Fig. 3) which fit loosely, respectively, posts 13 and 14, rising vertically from and secured to the plate 6. At the rear end of the striking plate 8 the plate 6 is provided with a recess 15 permitting the insertion of a tool

therein for the purpose of prying the gage plate 10 from the striking plate 8 in case it should stick thereon.

Each of the free ends of the posts 13 and 14 is provided with a blind orifice 16 to form a chamber 17 having a solid bottom 18. Depending from and secured to the plate 7 are two posts or sleeves 19 and 20 which fit over and slide telescopically on the posts 13 and 14, respectively. Each of the free ends of the posts 19 and 20 is provided with a blind orifice 21 to form a chamber 22 having a solid bottom 23. Interposed between the bottoms 18 and 23 of the chambers 17 and 22 is a coiled spring 24.

Depending from and secured to the plate 7 is a die 25 provided with the cutting knives 26, 27 and 28 shaped, respectively, to form the ornamental cut-outs 29, 30 and 31 (Fig. 3). As shown in Fig. 3 the gage plate 10 is provided with two gage blocks 32 and 33 pinned thereto. These blocks are shaped to engage the peripheral edge of the shoe upper blank 34 adjacent the base of a strap 35. The blocks 32 and 33 are spaced apart to allow the strap to extend between them over the gage plate 10.

Rising vertically from and secured to the plate 7 are two pins 36 and 37. These pins may be inserted, respectively, into vertical sockets 38 and 39 formed in a holder 40 provided with a polygonal shank 41 mounted to engage a polygonal opening 42 formed in the carrier 43 of a well known type of machine for forming ornamental cut-outs in shoe upper blanks. The shank 41 passes into a chamber 44 formed in the carrier 43. The upper end of the shank 41 is pinned to a cap 45 provided with a depending skirt 46 engaged slidably with the walls of the chamber 44. The holder 40 is maintained normally engaged with the carrier 43 by a spring 47 coiled around the shank 41 and interposed between the bottom of the chamber 44 and the skirt 46.

Cooperating with the pins 36 and 37 is a spring-pressed plunger 48 having a central head 49 arranged to engage notches 50 formed in the pins 36 and 37 in the manner disclosed in my pending application Serial No. 336,122. When it is desired to remove the unitary die assembly from the holder 40 the protruding end of the plunger 48 is pushed in against the tension of its spring to withdraw the head 49 from engagement with the notches 50 in the pins 36 and 37. When it is desired to insert the unitary die assembly into the holder 40 the protruding end of the plunger 48 is pushed in, the pins 36 and 37 are inserted in the sockets 38 and 39, respectively, and the plunger 48 is released whereupon the plunger spring moves the head 49 into engagement with the notches 50 in the pins 36 and 37.

In the illustrated embodiment of the invention the plates 6 and 7, the striking plate 8, the gage plate 10, the posts 13, 14, 19 and 20, the springs 24 and the pins 36 and 37 are standardized. That is, the plates 6 and 7, the striking plate 8, the gage plate 10, the posts 13, 14, 19 and 20, the springs 24 and the pins 36 and 37 in one die assembly are identical with the corresponding parts in any other die assembly of the kind described in this specification. With this construction the only elements in one assembly which differ from any other assembly are the die 25 and the gage blocks 32 and 33.

In making up an assembly the striking plate 8 and the posts 13 and 14 are secured to the plate 6. The gage plate 10, provided with the gage blocks 32 and 33, is superimposed on the striking plate 8 by threading the posts 13 and 14 through the holes 11 and 12. Then the springs 24 are inserted into the chambers 21 of the posts 13 and 14. The posts 19 and 20, the die 25 and the pins 36 and 37 are secured to the plate 7. Then the posts 19 and 20 are fitted over the springs 24 and the posts 13 and 14. The posts 19 and 20 have a tight sliding fit with the posts 13 and 14 so that after being assembled thereon a depression of the plate 7 towards the plate 6 causes air to be expelled out of the chambers 17 and 22, thus creating a condition of unbalanced pressure therein sufficient for atmospheric air to hold the posts 13 and 14 from dropping out of the posts 19 and 20 when the springs 24 return the plates 6 and 7 to their normal spaced positions. This construction permits the assembly, comprising the plates 6 and 7 and the parts carried thereby, to be handled as a unit both in inserting it into the cut-out forming machine and removing it therefrom for storage. The cooperating elements in the unit assembly are held in their proper operating relation both in use and in disuse. When a die and/or gage becomes broken or obsolete the die and/or gage may be removed and replaced by a new die and/or gage.

Heretofore it has been considered essential in order to obtain a clean cut-out in the shoe upper blank to employ a die striking plate of soft material, such as fibre, lead or brass and/or to interpose between the striking plate and the shoe upper blank a piece of paper, which is moved after each stroke of the die to present a fresh surface thereto. This paper is expensive and its use adds materially to the cost of operation of cut-out machines.

In the illustrated embodiment of the present invention the die striking plate 8 is made of steel and no paper is interposed between it and the shoe upper blank. Experience has demonstrated that the life of the die is much longer when used with a steel striking plate than when it is used with a metal striking plate other than steel and/or with a paper backing. Of course the steel striking plate wears out eventually, but in the illustrated

embodiment of the present invention the life of the steel striking plate is prolonged by mounting it on the plate 6 for reversal when one surface thereof becomes worn out. When reversed the die striking plate 8 may be used for a long time before being replaced by another plate 8. These steel striking plates 8, being standardized, may be made very cheaply.

It will be apparent to those skilled in the art that in operating upon certain types of work it may be desirable to locate the gage on the die. In operating upon other types of work the gage may be located on the striking plate. In still others it may be desirable to dispense with any gage. Dispensing with a gage is permitted by the peculiar characteristics of the well known type of machine identified by the holder 40 and the carrier 43. In this machine the cap 45 is depressed by a plunger operated from a foot treadle to lower the die upon the work which may be manipulated by hand to locate the die properly thereon. Thereafter a second foot pedal is operated to throw into action power mechanism for depressing the plunger to drive the die through the work. Dividing the movement of the die in this way permits the extent of movement of the die in forming the cut-out to be accurately controlled so that it may form a clean cut without, however, digging into the striking plate.

In modern shoe making the location of some of the cut-outs require their backing with a reinforcing stay to prevent distortion of the cut-outs during the shoe making operations. After the shoe is made the reinforcement may be cut out either by hand or by a Booth trimmer. With a machine in which the die is engaged with the work manually prior to throwing in the power mechanism for driving the die through the work, the die may be located in the reinforced cut-outs without the use of any gage in order to position the die properly for the cutting out of the reinforcement flush with the walls of the cut-out in the shoe upper blank.

In Fig. 5 the plate 8 is shown with a central opening 51 in which is pressed a steel die striking disk 52 which may be reversed when one surface becomes worn in use and then replaced by another one of the standard disks.

Nothing herein explained is to be interpreted as limiting the invention in the scope of its application to use in connection with the particular apparatus or the particular mode of operation or both selected for purposes of illustration and explanation. While the particulars of construction herein set forth are well suited to one mechanical form of the invention, it is not limited to these details of construction, nor to the conjoint use of all its features, nor is it to be understood that these particulars are essential since they may be modified within the skill of the artisan without departing from the true scope of the actual invention, characterizing features of which are set forth in the following claims by the intentional use of generic terms and expressions inclusive of various modifications.

What is claimed as new, is:

1. In a die assembly, the combination with means for supporting a die and means for supporting a striking plate therefore, of means for connecting the die supporting means and the plate supporting means comprising telescoping tubes connected, respectively, to the die supporting means and the plate supporting means.

2. In a die assembly, the combination with means for supporting a die and means for supporting a striking plate therefor, of means for connecting the die supporting means and the plate supporting means comprising telescoping tubes connected, respectively, to the die supporting means and the plate supporting means, each tube having a blind orifice, and a spring interposed between the ends of an opposed pair of the telescoping tubes.

3. In a die assembly, the combination with a standardized plate having a pair of standardized pins projecting upwardly therefrom and a die and a pair of standardized tubes depending from said plate, of a second standardized plate having a pair of standardized tubes projecting upwardly therefrom, a tube of each pair being constructed to telescope on the opposed tube of the other pair.

4. In a die assembly, the combination with a standardized plate having a pair of standardized pins projecting upwardly therefrom and a die and a pair of standardized tubes depending from said plate, of a second standardized plate having a pair of standardized tubes projecting upwardly therefrom, a tube of each pair being constructed to telescope on the opposed tube of the other pair and a standardized striking plate mounted on the second plate.

5. The combination with a die striking plate, of means supported thereby for gaging a shoe upper blank including a strap thereon comprising a standardized plate and a plurality of spaced blocks mounted thereon to embrace the peripheral edge of the blank on opposite sides thereof and adjacent to the base of the strap.

6. The combination with a supporting plate having a die striking plate thereon, a pair of tubes projecting vertically from the supporting plate, a gage plate having openings receiving the tubes, of a second supporting plate and a die and a pair of tubes depending from the second supporting plate, said last named pair of tubes receiving the first named pair of tubes.

7. The combination with a supporting plate having a die striking plate thereon, a

pair of tubes projecting vertically from the supporting plate, a gage plate having openings receiving the tubes, of a second supporting plate and a die and a pair of tubes depending from the second supporting plate, said last named pair of tubes receiving the first named pair of tubes, and means for normally maintaining the die spaced from the die striking plate.

8. The combination with a supporting plate having a die striking plate thereon, a pair of tubes projecting vertically from the supporting plate, a gage plate having openings receiving the tubes, of a second supporting plate and a die and a pair of tubes depending from the second supporting plate, said last named pair of tubes receiving the first named pair of tubes, and means for normally maintaining the die spaced from the die striking plate comprising a spring mounted within the cooperating tubes of each opposed pair.

9. The combination with a die, a standardized gage plate and a standardized die striking plate supporting said gage plate, of means for composing them into an assembly for use as a unit in a cut-out forming machine and for storage in disuse as a unit independently of the cut-out forming machine.

10. The combination with a die, a standardized gage plate, a standardized die striking plate, and a standardized base plate supporting said gage and striking plates, of means for composing them into an assembly for use as a unit in a cut-out forming machine and for storage in disuse as a unit independently of the cut-out forming machine.

11. The combination with a die, a standardized striking plate therefor, a standardized gage plate, and a standardized base plate supporting said gage and striking plates, and means for composing them into an assembly for use as a unit in a cut-out forming machine and for storage in disuse as a unit independently of the cut-out forming machine, of means for removing either the die or the plates from said assembly independently.

12. The combination with a die, a standardized steel striking plate therefor, and a standardized gage plate supported by said striking plate, of means for composing them into an assembly for insertion as a unit into a die press and for its removal therefrom as a unit.

13. The combination with a die, a standardized reversible steel striking plate therefor and a standardized gage plate supported by said striking plate, of means for composing them into an assembly for insertion as a unit into a die press and for its removal therefrom as a unit.

14. In a die assembly, the combination with a base member, a striking plate supported thereby, posts upstanding from said base member, an overhead die, a support therefor having depending sleeves telescopically receiving said posts for aligning and guiding the vertical movement of the die, and means for resiliently impelling said die away from said striking plate, of a gage plate supported by said striking plate for positioning stock relatively to the die.

15. In a die assembly, the combination with a base member, a striking plate supported thereby, posts upstanding from said base member, an overhead die, a support therefor having depending sleeves telescopically receiving said posts for aligning and guiding the vertical movement of the die, and means for resiliently impelling said die away from said striking plate, of a gage plate supported by said striking plate and provided with blocks for engaging at least a portion of the peripheral edge of stock to position it relatively to the die.

16. In a die assembly for use in a cut-out forming machine, the combination with a base member, a striking plate supported thereby, posts upstanding from said base member, an overhead die, a support therefor having depending sleeves telescopically receiving said posts for aligning and guiding the vertical movement of the die, means for resiliently impelling said die away from said striking plate, and a gage plate supported by said striking plate for positioning stock relatively to the die, of means carried by the die support for detachably securing the die assembly to the cut-out forming machine.

In testimony whereof I have signed my name to this specification.

ARTHUR W. ALTVATER.