June 21, 1949. F. WUNDER 2,473,837

DIE AND DIE SET FOR SHOE PARTS AND THE LIKE

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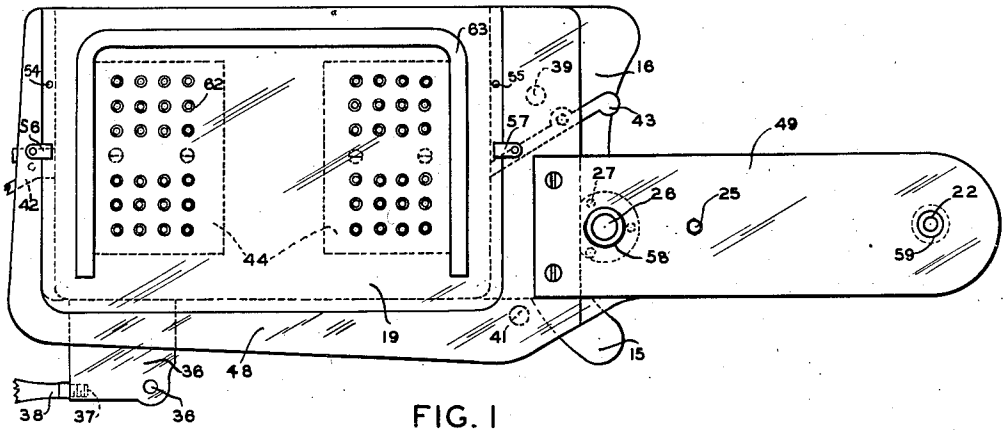


FIG. 1

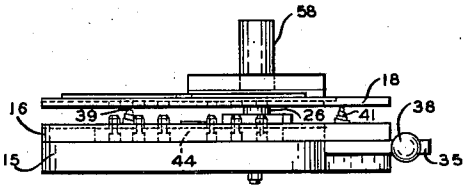


FIG. 2

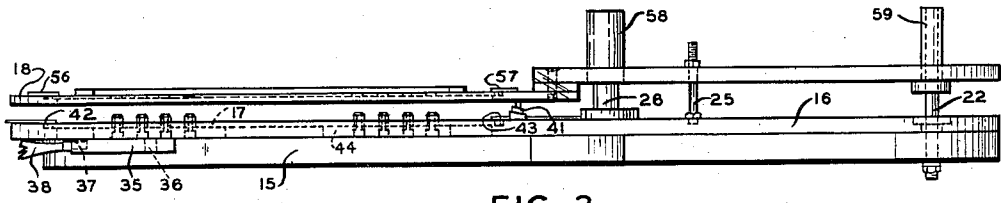


FIG. 3

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FIG. 4

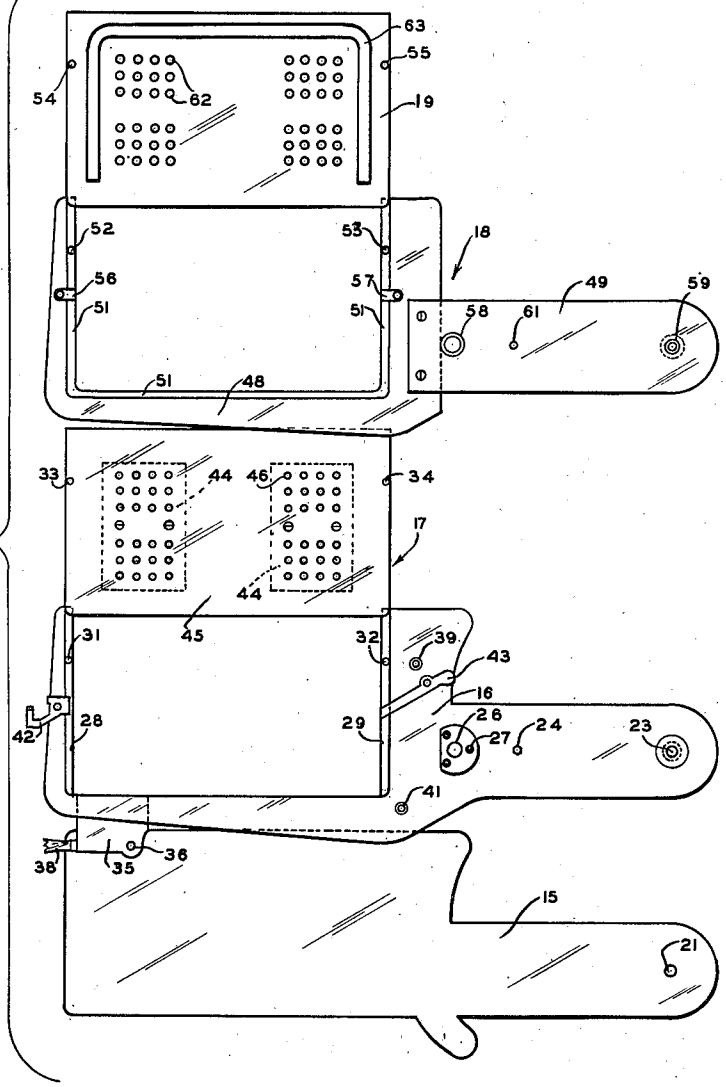
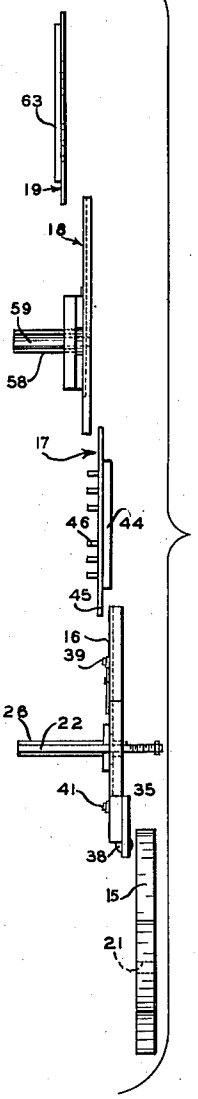


FIG. 5



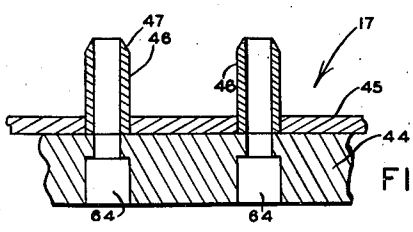


FIG. 6

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DIE AND DIE SET FOR SHOE PARTS AND THE LIKE

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6 Claims. (Cl. 164—93)

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This invention relates to cutting and perforating die assemblies of the type especially adapted for use in operating on material for shoe parts to cut ornamental designs therein.

It is an object of the invention to provide a die assembly which may be withdrawn from the machine in which it is employed for the purpose of inserting and removing a blank to be cut and for changing the die proper to accommodate for various designs with greater speed and accuracy than has been known heretofore in the art.

Another object of the invention is to provide a die assembly of the type described which is easy to operate, which provides for the instant interchangeability of its die proper to various designs, which is adaptable to positive and accurate operations, is sturdy in construction, has a minimum number of working parts and is economical to manufacture.

Other objects and advantages will become apparent as the description proceeds and a more comprehensive understanding of the invention will be afforded from the following detailed specification when considered in conjunction with the accompanying drawings, in which

Figs. 1, 2 and 3 are plan, end and front views, respectively, of a die assembly embodying the instant invention,

Fig. 4 is in the nature of an exploded view showing separated the various parts of the die assembly in plan in the order of their positioning from top to bottom,

Fig. 5 is in the nature of an exploded view showing separated the various parts of the die assembly in end elevation in the order of their positioning from top to bottom, and

Fig. 6 is a detail view showing an arrangement of the cutting tubes in the tube plate of the die.

In perforating or cutting designs in material for shoe parts two machines are most commonly used, namely, punch presses and clicker die presses. The instant invention relates to die assemblies employed with the former type machine in which a die assembly is supported on the bolster of the punch press for operation by the machine's hammer or press plunger. Due to the fact that a large amount of the material operated upon in these machines is sleazy in texture, it is not possible to operate them in a manner similar to punch presses used to operate on stiff materials, such as metals. In other words, the blank which is to be perforated cannot be pushed into the die against a gauge plate while the punch press hammer is on its upward stroke. Thus, it is necessary that the blank must be

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placed on the die by hand and smoothed into position before the cutting operation is effected. Accordingly, die assemblies have been proposed which provide for withdrawal of the die assembly from the punch machine into a position where the operator can smooth the blank onto the die, preparatory to moving the same back into the machine where the cutting operation is effected. Without exception, these prior art devices have taken the form of die assemblies which are moved into and out of the machine for loading and unloading in trackways fixed to the bolster of the machine. With these devices, instant interchangeability of the die proper in the assembly has not been possible due to the fact that the assembly must be "set up" for each die and thereafter "knocked down" when the die is changed to a different design. Moreover, the operation of these die assemblies has been unnecessarily time consuming due to their straight line motion.

In the instant invention, it is proposed to secure a die assembly to the punch press in a manner such that the same may be moved into and out of the machine about a fixed point to which the die assembly is pivoted. Furthermore, it is proposed to provide a pivoted tube plate mount and a pivoted stripper plate mount cooperating therewith, both of which are capable of receiving respectively a tube plate and a stripper plate which are instantly changeable to effect a complete change of the die proper. In accordance with this teaching and in the preferred embodiment of the invention, a die assembly is provided which comprises a rest plate 15, a tube plate mount 16, a tube plate 17, a stripper plate mount 18, and a stripper plate 19. The rest plate 15 is arranged to be secured in a position above a bolster (not shown) of a punch press and is drilled with a hole 21 which receives a stud or bolt 22 about which the tube plate mount 16 and the stripper plate mount 18 are rotated.

The tube plate 16 takes the form of a plate like arm which is drilled at 23 to receive the stud 22. A tapped hole 24 is also provided in the arm of this member to receive a restraining stud 25 which extends through a portion of the stripper plate mount 18. Also, this portion of the tube plate mount supports a collared sleeve 26 which is secured thereto by a plurality of screws 27. The bifurcated extensions of this member are shouldered to provide ledges 28 and 29 upon which the tube plate 17 rests. Extending upwardly from the ledges 28 and 29 are two studs or pins 31 and 32, respectively, which engage in two holes 33 and 34 in the tube plate 17 to se-

cure the latter on the tube plate mount. Also forming a part of the tube plate mount 16, is a handle block 35 which is drilled with two holes 36 and 37 to receive a handle 38. The two holes 36 and 37 are provided and are so arranged that the handle 38 may be screwed into the block in one of three positions selected by an operator. Thus, the handle may be screwed into the end of the block, as shown, to lie in a plane with the tube plate mount; may be screwed into the block in the hole 36 from the top, or positioned in the same hole from the bottom. The block 35 also forms a stop for the tube plate mount which acts against the base plate 15 when the assembly is moved into cutting position.

This mount also supports two volute springs 39 and 41, which supply a restoring force to return the stripper plate mount to its normal position after a cutting operation has been made. Two latches 42 and 43 are also fixed to the tube plate mount 16 to retain the tube plate 17 in position thereon.

The tube plate 17 comprises two sections 44 and 45 which are screwed together as is shown. The section 45 mounts a plurality of cutting or perforating tubes 46, which are arranged in any required design. These tubes may be round, square, oblong or of any other desired shape necessary to cut the required design in the material. In any case, they are each provided with a beveled edge 47 (Fig. 6) which form a cutting or knife like edge therefor.

Occupying a position immediately above the tube plate mount 16 and the tube plate 17, is the stripper plate 18 comprising a bifurcated member 48 and an arm 49 which is offset in a plane above that of the member 48. The member 48 is shouldered to form a ledge 51 on which the stripper plate 19 rests. Here, also, two studs 52 and 53 are provided which engage respectively in holes 54 and 55 in the stripper plate 19. The latter element is latched into position onto the stripper plate mount by two latches 56 and 57. The arm 49, which is secured to the member 48, mounts two sleeve tubes 58 and 59 that receive respectively the collared sleeve 26 and the stud 22, the former being supported on the tube plate mount 16. A hole 61 is also drilled in this arm to receive the restraining stud 25.

With this arrangement of the parts, the stripper plate mount 18 is free to move vertically above the tube plate mount on the sleeve 26 and the stud 22 which fit into the tubes 58 and 59 respectively with close tolerances.

The stripper plate 19, which is latched into position on the stripper plate mount 18, has a plurality of holes 62 drilled therein corresponding in number and arrangement with the cutting tubes 46 of the tube plate 17. A fence or gauge 63 is also provided on the stripper plate 19 against which a blank is moved for accurate positionment with respect to the die proper of the assembly.

In operation the die assembly is mounted in a punch press (not shown) so that the rest plate 15 will occupy a position above and rest on the bolster of the machine. The tube plate 17 and a stripper plate 19, forming the die proper of the assembly, are then secured in their respective mounts as above described. By means of the handle 38 the pivoted portions of the die assembly are withdrawn from underneath the punch press hammer and a blank, which is to be cut, is smoothed onto the stripper plate 19 in positionment against the gauge 63 thereof. The die assembly is then moved under the press hammer by means of the handle 38 and the machine is put into operation to press the stripper plate 19, the stripper plate mount 18, and the blank itself downwardly until the tubes 46 are forced through the holes 62 in the stripper plate 19 to cut the design in the blank. The press hammer is next withdrawn, at which time the volute springs 39 and 41 restore the stripper plate mount 18 and the stripper plate 19 to their normal positions and withdraw the cutting tubes from the blank. The severed portions of the blank are, through repeated operations, forced downwardly through the tubes 46 and are released in the expanded areas 64 (Fig. 6) which communicate with the bore of the tubes. As the pivoted portions of the die assembly are then withdrawn to insert a new blank, the tube plate mount 16 moves off of the rest plate 15 and the cut portions of the blank are free to fall out of the areas 64.

As will be apparent to those skilled in the art, it will be observed that due to the pivoted movement of the die assembly, the same may be withdrawn from the punch press to a position for loading and unloading with greater speed than can be effected with straight line motion. Also, the unique arrangement of the tube plate mount and the stripper plate mount provides for the instant inter-changeability of the tube plate 17 and the stripper plate 19 forming the die proper.

Various changes may be made in the details of construction, within the scope of the appended claims, without departing from the spirit of this invention. Parts of the invention may be used without the whole and improvements may be added while retaining some or all of the advantages of the invention.

What is claimed is:

1. In a die assembly of the type described, a tube plate mount and a stripper plate mount both of which are adapted to be pivoted about a fixed point, a stripper plate detachably supported on said stripper plate mount; and a tube plate similarly supported on said tube plate mount.

2. In a die assembly of the type described, a rest plate, a tube plate mount supported above and pivotably movable with respect to said rest plate, a stripper plate mount resiliently supported on said tube plate mount and pivotable therewith, a detachable tube plate supported on said tube plate mount, and a stripper plate detachably supported on said stripper plate mount.

3. In combination with a die assembly having a die mount pivotably movable with respect to a punch press plunger, a die detachably supported in said die mount comprising a stripper plate, a gauge supported on said stripper plate, and a tube plate having a first section supporting a plurality of cutting tubes passable through holes in said stripper plate and secured to a second section forming a frame for said first section.

4. In a die assembly of the type described, a tube plate mount pivotably movable about a fixed member, a tube plate detachably supported in said tube plate mount, a stripper plate mount pivotable with said tube plate mount about said fixed member, a stripper plate detachably supported on said stripper plate mount, means for supporting said stripper plate mount above said tube plate mount for vertical movement with respect thereto comprising a plurality of sleeve tubes connected to said stripper plate mount, at

least one of which receives a sleeve fixed to said tube plate mount and another of which receives said fixed member, and means acting on said stripper plate mount and said tube plate mount for applying a separating force as between these members.

5. In combination with a punch press having a press plunger, a die comprising a tube plate and a stripper plate movable relatively each to the other, a die mount pivotably movable into and out of the path of said press plunger about a fixed point having means therein providing for the relative movement of said tube plate and said stripper plate.

6. Apparatus as claimed in claim 5, including means for detachably connecting said tube plate and said stripper plate to said die mount.

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REFERENCES CITED

The following references are of record in the file of this patent:

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