

May 22, 1934.

H. R. STANBON

1,959,602

PERFORATING MACHINE

Filed Feb. 1, 1933

2 Sheets-Sheet 1

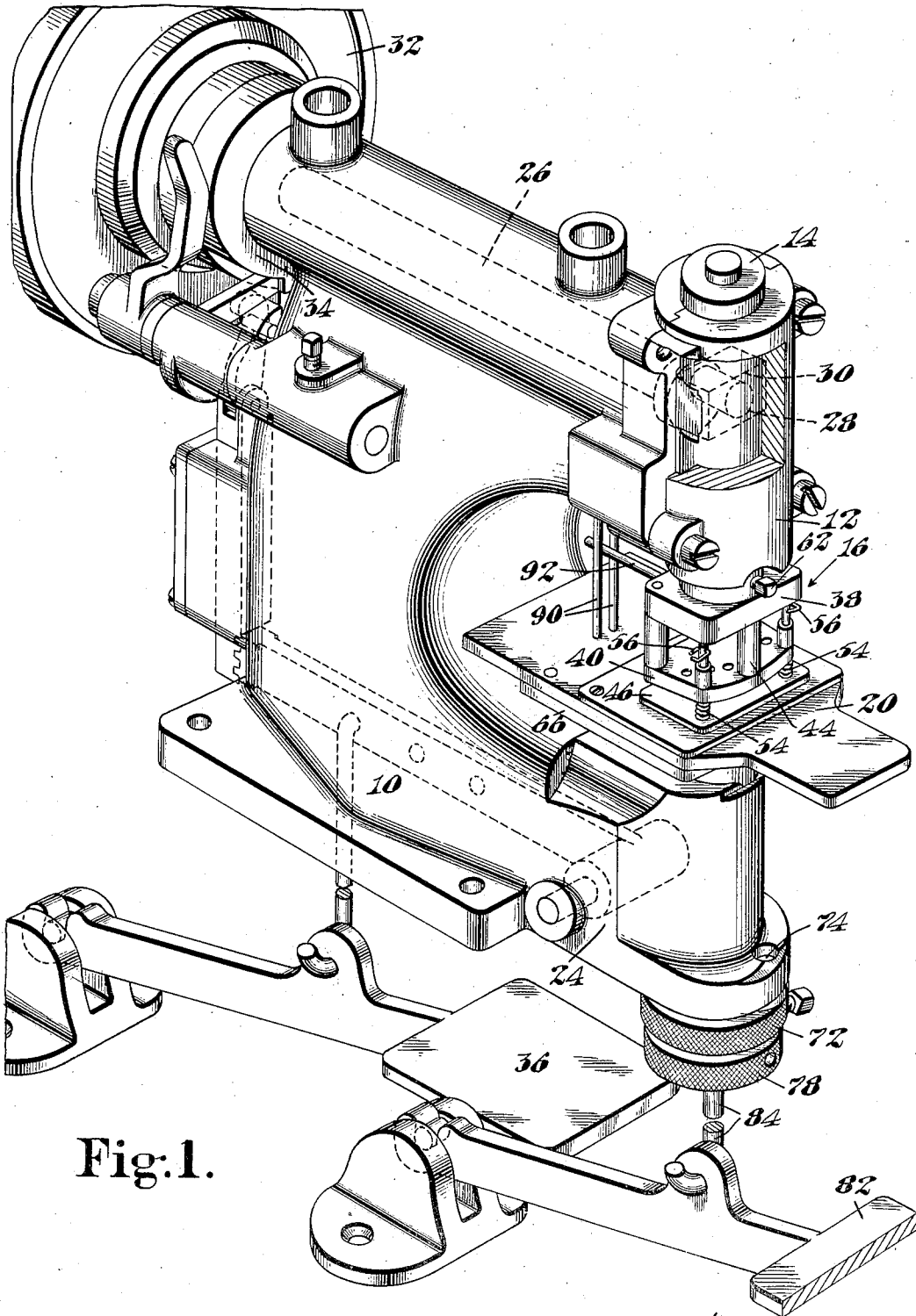


Fig.1.

INVENTOR.
Harry Rings Stalton
By his Attorney,
Harlow M. Wain.

May 22, 1934.

H. R. STANBON
PERFORATING MACHINE

1,959,602

Filed Feb. 1, 1933

2 Sheets-Sheet 2

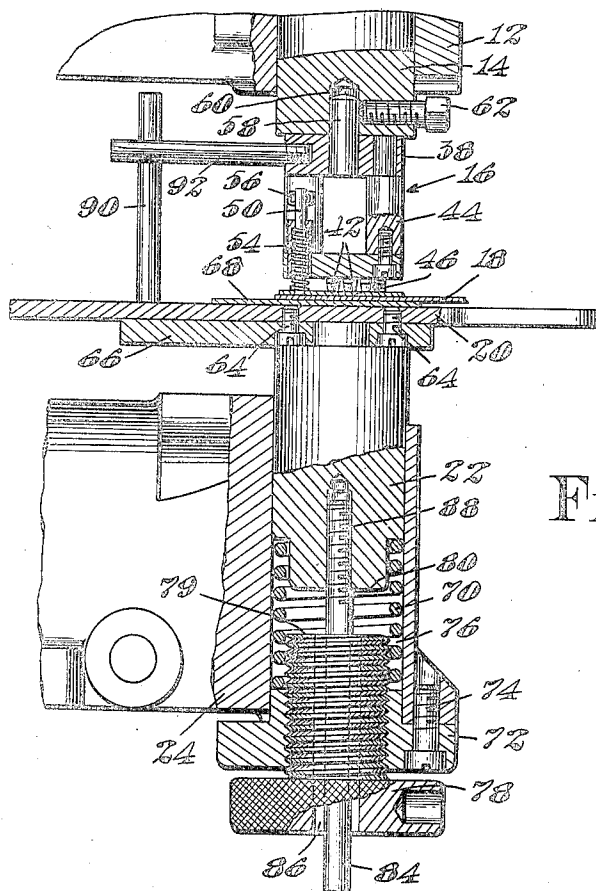


Fig. 2.

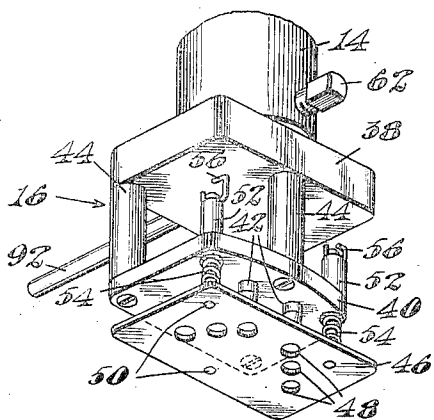


Fig. 3.

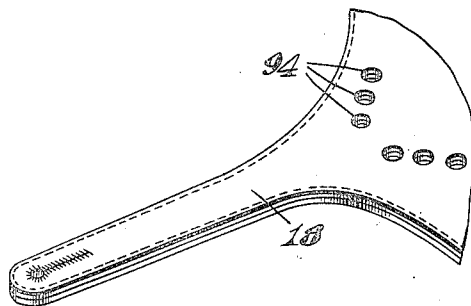


Fig. 4.

INVENTOR.
Harry Ruess Stanbon
By his Attorney,
Harlow M. Davis

UNITED STATES PATENT OFFICE

1,959,602

PERFORATING MACHINE

Harry Rines Stanbon, Salem, Mass., assignor to
United Shoe Machinery Corporation, Paterson,
N. J., a corporation of New Jersey

Application February 1, 1933, Serial No. 654,669

5 Claims. (Cl. 164—118)

This invention relates to a machine for operating upon shoe parts and is herein illustrated as embodied in a machine for performing cut-out operations on shoe uppers.

It has long been customary in the manufacture of shoes to ornament the uppers thereof by designs formed by perforating or cutting out portions of the uppers, the operation commonly being performed in a press by means of dies or punches. Machines for this purpose, heretofore in use, have been comparatively massive in construction in order to withstand the great pressures required to force dies through material, particularly in such cases where the dies are formed of a large number of punch tubes. In many cases the dies used in such machines are designed to perforate a considerable portion of the upper of a shoe and are consequently of correspondingly heavy construction. In some instances, however, it is found desirable to perforate a small portion only of the upper and consequently dies of heavier construction than necessary are used in order to fit such machines with the result that the operation is not economical both from the standpoint of the time consumed and the cost of the apparatus used.

It is an object of the present invention to provide a perforating machine which, without sacrificing advantages of such machines as heretofore constructed will be particularly adapted for economical performance of perforating operations upon small areas of shoe uppers.

In view of the foregoing and as illustrated, the invention provides a perforating machine having a die member and a work supporting member normally forced toward each other, together with means for moving the members relatively to the frame of the machine and means operative to limit movement of one of the members to force the die member through work positioned between the members. Preferably, and as shown, the die member is carried by a plunger and the work supporting member is mounted upon a slide and is resiliently forced into engagement with the die member, there being manually operable means for moving the work supporting member away from the die member to provide for insertion of the work.

The construction above outlined is advantageous in that the work, such as a shoe upper, can be readily located in operative position relatively to the die member and secured in such position by pressure of the work supporting member against the die member prior to operation of the plunger in forcing the die member through the work.

Other objects and features of the invention will be apparent from the following detailed description when taken in connection with the

accompanying drawings and will be pointed out in the claims.

In the drawings,

Fig. 1 is a perspective view of a perforating machine embodying one form of the invention; 65

Fig. 2 is a view in vertical cross-section illustrating the construction and arrangement of the die and work support;

Fig. 3 is a perspective view showing one form of die adapted for use in the machine; and 70

Fig. 4 is a perspective view of a portion of a shoe-part blank illustrating the work done by the machine.

As illustrated in Fig. 1, the machine comprises a C-shaped frame 10, in the upper arm 12 of which is mounted a reciprocating plunger 14 carrying at its lower end a die 16 arranged for operation upon work such as a shoe part 18 positioned upon a work support 20 carried at the upper end of a slide 22 mounted in the lower arm 24 of the frame in axial alinement with the plunger.

Reciprocating movements are imparted to the plunger 14 by a rotary shaft 26 which is operatively connected to the plunger through an eccentric 28 and block 30. The shaft 26 is rotated by means of a pulley 32 and a one-revolution clutch 34 under the manual control of a treadle 36.

The die 16, best shown in Figs. 2 and 3, comprises a base plate 38 and a punch plate 40 bearing a plurality of punch tubes 42 which extend through the punch plate which is spaced from the base plate 38 by collars 44 to provide for elimination of the material cut by the tubes which passes through the tubes and out of the die between the two plates. In the die shown, use is made of a stripper plate 46 provided with perforations 48 which correspond in shape and number to the punch tubes 42 and are held in alinement therewith by pins 50 secured to the stripper plate and extending through the punch plate 40 and collars 52. The stripper plate is normally spaced from the punch plate by means of springs 54 surrounding the pins 50 and engaging the upper face of the stripper plate and the lower face of the punch plate. Movement of the stripper plate away from the punch plate is limited by cotter pins 56 which extend through the pins 50 and which are adapted to engage the upper surfaces of the collars 52. The die 16 is arranged to be readily attached to the plunger 14 by a pin 58 positioned in the base plate 38 and arranged to be engaged in a recess 60 in the plunger 14 and to be secured therein by a set screw 62.

The work support 20 is in the form of a plate which is removably secured by screws 64 to a base plate 66 forming the upper portion of the slide 22. The immediate work-engaging portion of the work support comprises a brass plate 68 secured to the plate 20 and arranged to engage the

cutting edges of the tube 42 during the perforating operation to prevent dulling of the tools.

The lower end of the slide 22 is engaged by a spring 70 which rests upon a plate 72 secured by screws 74 in position in the recess 76 in which the plunger is mounted. The spring 70 is operative normally to force the work support upwardly into engagement with the die 16 but permits downward movement of the work support under the force exerted by the plunger 14 in performing the perforating operation. Downward movement of the work support is limited by an adjustable stop comprising a nut 78 screw-threaded into the plate 72, the upper portion 79 of the nut constituting an abutment adapted to engage an abutment 80 upon the lower portion of the plunger 22. The construction is such that when downward movement of the work support is arrested by the nut 78 further downward movement of the plunger 14 will result in the forcing of the punch tubes 42 through work positioned upon the support.

Manually controlled means is provided for moving the work support 20 away from the die 16 to permit location of the work on the support. To this end, there is a treadle 82 having a treadle rod 84 which extends through an opening 86 in the nut 78 and is secured by screw threads 88 to the plunger 22. Operation of the treadle 82 effects movement of the work support in a downward direction, thereby permitting the operator to locate the work, such as a quarter 18, Figs. 2 and 4, upon the work support 20 with the punch tubes 42 in alinement with that portion of the work upon which the perforating operation is to be performed, release of the treadle serving to permit the upward movement of the work support to force the work against the punch tubes. By this mechanism, the operator is enabled quickly and accurately to position the work. In this connection, it is to be noted that the positioning of the work may be done by adjusting the work relatively to the punch tubes themselves or relatively to the edge portions of the stripper plate which is definitely alined with the punch tubes.

It is desirable to have the cutting-edge portions of the tubes 42 of the die strike the same portions of the brass plate, otherwise ridges might be formed in the plate which would tend to break the tubes. In view of this, means is provided for insuring alinement of the cutting edges of the die with the same portions of the work support during successive perforating operations. To this end, the work support is provided with two posts or guide members 90 extending at right angles thereto and spaced apart sufficiently to receive between them a pin 92 extending laterally from the base plate 38 of the die. This arrangement is such that relative movement between the die and work support in a vertical direction may take place but angular movement between the two is prevented and consequently the die will be maintained in alinement with the work support. This is particularly advantageous in view of the fact that various dies and their cooperating work supports may be used in a machine at different times, and by providing means for insuring alinement of a die and its corresponding work support the assembly of that particular die and its support in the machine can be rapidly accomplished.

In the operation of the machine, the treadle 82 is depressed to effect downward movement of the work support 20 a slight distance away from the die 16, and the work, such as, for example, a quarter 18, is positioned upon the work support

beneath the die and is adjusted into position with the punch tubes properly located relatively to marginal or other portions of the work and the treadle is then released with the result that the spring 70 forces the work support upwardly to clamp the work between the support and the die. The treadle 36 is then depressed to initiate the reciprocation of the plunger 14 which moves downwardly carrying with it the die 16, the work 18, and the support 20 until the downward movement of the support is arrested by engagement of the slide 22 with the abutment 79, after which continued movement of the plunger forces the die through the work to produce perforations, such as perforations 94.

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

1. A perforating machine comprising a frame, cooperating die and work-supporting members mounted in the frame, means normally operative to force the members toward each other, means for moving the members simultaneously relatively to the frame, and means operative to limit movement of one of the members thereby effecting operation of the members upon work positioned between them.

2. A perforating machine comprising a frame, a die member and a work-supporting member mounted in the frame, means normally operative to force the members into engagement with each other, means for moving the die member and the work-supporting member relatively to the frame, and a stop for arresting movement of one of the members thereby effecting an operation of the members upon work positioned between them.

3. A perforating machine comprising a die member, a work-supporting member, resilient means tending normally to force the members toward each other, manually controlled means for causing relative movement between the members to provide for insertion of work between them, means for moving the members in a predetermined direction relatively to the frame, and a stop for limiting movement of one of the members thereby effecting an operation of the members upon the work.

4. A perforating machine comprising a frame, a plunger mounted in the frame, a die carried by the plunger, a slide mounted in axial alinement with the plunger and movable into juxtaposition with the plunger in any position thereof, a work support carried by the slide, a spring normally operative to maintain the slide in juxtaposition with the die, means for operating the plunger to move the die, work support and slide in an axial direction, and a stop for limiting movement of the work support to effect a perforating operation of the die upon work positioned between the die and the work support.

5. A perforating machine comprising a frame, a die and a work support mounted in the frame for movement relatively thereto, resilient means normally operative to maintain the work support and die in engagement, means for causing relative movement between the work support and the die to provide for insertion of work therebetween, an abutment, means for moving the die, work support, and work carried by the work support toward the abutment to effect an operation of the die upon the work, and means for varying the position of the abutment relatively to the frame.