UNITED STATES PATENT OFFICE.

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DIEING-OUT MACHINE.

1,081,751.

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To all whom it may concern:

Be it known that I, Socrates Keats, a subject of the King of Great Britain, residing at Leicester, Leicestershire, England, have invented certain Improvements in Dieing-Out Machines, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to dieing-out machines and more particularly to machines intended for use in dieing-out thin sheet material, such as parts of uppers for boots and shoes.

Some of the objects of the invention are to provide a dieing-out machine which shall be quick in operation and at the same time shall be so constructed that excessive pressure will not be imparted to the die in a dieing-out operation; to provide a machine of an improved construction adapted to insure that but a single blow will be applied to the cutting die when the machine is started; and to provide a machine that may be used with greater ease and convenience by the operator than machines herebefore employed.

To these ends the invention consists in the features and combinations of parts hereinafter described and referred to in the appended claims.

In the drawings,—Figure 1 is a view in side elevation of a machine constituting one embodiment of the present invention; Fig. 2 is a view in perspective with parts in section of the upper portion of the machine shown in Fig. 1; Fig. 3 is a view in vertical section of a portion of the machine shown in Fig. 1; Fig. 4 is a view in perspective of parts showing in a disassembled relation parts illustrated in Fig. 3; Fig. 5 is a view in front elevation with parts in vertical section of the power actuated means hereinafter referred to and parts cooperating therewith; Figs. 6 and 7 are views similar to Fig. 5 showing the parts in different positions.

Referring to the drawings, the reference numeral 1 indicates a frame upon which the parts hereinafter described are mounted.

The frame 1 is provided with a vertical web 4 and a horizontal web 6 to the faces of which is secured a bracket 8. The bracket 8 carries at its forward end a wooden block 10 which constitutes a cutting bed. The block 10 rests upon a base 12, said base having a depending convex extension 14 which rests in a concave seat formed in the upper face of the bracket 8. The base 12 is also provided with a depending stud 16 which extends through an aperture formed in a web 18 upon the bracket. The lower end of the stud 16 is threaded to receive clamping devices 20 whereby the base 12 may be clamped upon the concave seat in the bracket 8. The base 12, which is of rectangular shape in plan, is provided at each corner with a vertical web 22 extending diagonally of the base, and each web 22 is connected to the bracket 8 by bolts 24 which are constructed for adjustment in length. It will be seen that by manipulating the bolts 24 the base 12 and cutting bed 10 may be adjusted to bring the upper surface of the bed into a parallel relation with the lower face of the presser member hereinafter described.

The bracket 8 is provided at its rear end with a vertical bore of two diameters, as shown in Fig. 3. In the upper enlarged portion of this bore is received the lower end of a tubular shaft 26, upon the upper end of which is secured a presser member 28 projecting forwardly therefrom. In the lower portion of the vertical bore in the bracket 8 is arranged a coiled spring 30. The upper end of the spring 30 transmits pressure to the tubular shaft 26 through a cap plate 32 which is arranged within the lower portion of the shaft 26 and rests against a shoulder formed on the interior thereof. The lower end of the spring 30 is engaged by a bottom plate 34 which rests upon the top of a plug 36 screwed into the lower end of the vertical bore in the bracket 8. Secured to the top plate 32 and passing centrally through the coil spring 30 is a rod 38, the lower end of which extends through a central bore formed in the plug 36. This bore in the plug 36 is threaded and receives an exteriorly threaded sleeve 40 having a smooth inner surface. Upon the lower end of the rod 38, which is threaded for this purpose, is arranged an adjustable stop nut 42 above which is placed one or more washers 44 of compressible material, such as leather. It will be seen that upward movement of the cap plate 32 through the action of the spring 30 is limited by engagement of the stop upon the lower end of the rod 38 with the lower end of the sleeve 40. Variation in the position of the limit of upward move.
2. Ment of the cap plate 32 may be secured by adjustment of the sleeve 40 in the plug 36. Within the upper end of the tubular shaft 26 is received a plunger 46 which rests upon a washer 48 supported upon a shoulder formed on the interior of the shaft 26. The plunger 46 is arranged in a vertical bearing 50 formed upon the upper portion of the frame 1 and is splined in said bearing so that it is held from rotatory movement about a longitudinal axis and is free for vertical movement in said bearing. It will be seen that the plunger 46 constitutes an upper bearing for the tubular shaft 26 so that said shaft by its upper and lower bearings is securely held from lateral movement.

In order that the bracket 8 may be so positioned upon the frame 1 that the vertical bore therein will be in proper alignment with the upper bearing 50 for the shaft 26, said bracket is secured to the frame by connections permitting its exact adjustment into a proper position. As shown in Figs. 1 and 3 the connections between said bracket and the webs 4 and 6 upon the frame 1 comprise bolts 52, successive portions of which are of different diameters and are threaded as shown in Fig. 3. It will be seen from this figure that by adjusting the several bolts 52 in the bracket 8 said bracket may be adjusted relatively to the frame into proper position. When a proper position has been secured, the bracket is clamped rigidly in position by the nuts upon the smaller end of each bolt 52.

In the upper end of the frame 1 is formed a horizontal bearing 54 in which is received a shaft 55 upon the rear end of which is arranged a loose pulley 56 and a fast pulley 58, a fly wheel 60 being formed integrally with the fast pulley 58. A belt shifter 62 is shown for transferring a driving belt from one pulley to the other. Upon the forward end of the driving shaft is arranged an eccentric pin 64 which constitutes a means for imparting a vertical reciprocatory movement to an eccentric sleeve 66 suspended upon the pin 64 and provided with a depending stem in which is movably secured a driving rod 68 by means of a set screw 70. The lower end of the driving rod 68 is received within a cavity formed in the upper end of the plunger 46. Within the plunger 46 is arranged a contact piece forming a shoulder 72 engaged by the lower end of the driving rod 68 in the active operation of the machine. As will appear from Figs. 2 and 5, upon the right-hand side of the shoulder 72 is provided a space in which the driving rod 68 may move vertically without imparting movement to the plunger 46. The driving rod 68 is held in its inoperative position by a spring 74 which presses the rod against the right-hand side of the inner wall of the plunger 46, as will appear from Fig. 5.

To move the driving rod 68 laterally into its effective position above the shoulder 72 there is provided a lever 76 pivoted upon the frame 1 and connected by a link 78 with a manually operated lever 80 pivoted at 81 upon the frame 1 for movement about a horizontal axis. Upon the lower end of the lever 76 is pivotally mounted a dog 82 which is maintained normally in the position shown in Fig. 5 by a stop pin 84 against which the dog is held by gravity. Arranged in a socket in the right-hand side of the plunger 46 in Fig. 5 is a vertical finger 86 which is held in said socket by a pin 88 and is pressed against the wall of the bearing 50 by a spring 90. The socket in which the finger 86 is received is so formed that said finger may be moved laterally by the lever 76 as indicated in Fig. 6. The upper end of the finger 86 is rounded off upon the side adjacent to the finger 82. The hand lever 80 is maintained normally in the position shown in Fig. 5 by a spring 92 which holds the lever against a stop 94 upon the frame 1.

It will be understood that in the operation of the machine the driving rod 68 is in continual reciprocation. To effect an acting stroke of the presser member 28 the hand lever 80 is depressed, moving the lower end of the lever 76 to the left in Fig. 5 and pressing the driving rod 68 into position over the shoulder 72, through the dog 82 and the laterally movable finger 86. In the descent of the driving rod 68 the plunger 46 will be depressed and the finger 86 will be drawn down with it. In the lower part of the downward movement of the plunger 46 the finger 86 will be drawn below the end of the dog 82 and will be moved to the right in Fig. 6 beneath said dog by the spring 90. The rounded upper end of the finger 86 facilitates the movement of said finger beneath the inner end of the dog 82. In the upward movement of the plunger 46 the dog 82 will be turned upon its pivot by the finger 86 into a position wherein it is ineffective to transmit lateral pressure to the driving rod 68, as shown in Fig. 1. The driving rod 68 is then free to be moved into its inoperative position at the close of the upward movement of the presser member. The movement of the presser member is thus restricted to a single reciprocation whether or not the operator at once releases the hand lever 80 after depressing it.

The spring 30 is so arranged that it not only imparts vertical movement to the tubular shaft 26 but also imparts a rotatory movement thereto. To this end the cap plate 32 is held from turning movement in its seat in the lower end of the tubular shaft 26 by means of pins 96, upon said seat, entering recesses in the face of the cap plate 32. The upper end of the spring 30 is rigidly held in fixed relation to the cap plate 32 by
a screw 98, entering the stem of said cap plate and arranged in a recess 100 formed in a coil of the spring 30. The bottom plate 34 is similarly held in fixed relation to the bottom end of the spring 30 by a screw 102 arranged in a recess 104 in a lower coil of the spring. The bottom plate 34 is held from turning movement relatively to the plug 36 by rods 106 projecting from said plug through passages 108 formed in the bottom plate 34. The plug 36 is held from turning movement in its bearing in the bracket 8 by a set screw 110 arranged in the bracket 8 in position to be forced against the side of the plug 36. It will be seen that by adjusting the plug 36 in its bearing the spring 30 may be placed under such tension that the shaft 26 may be held normally in a position adapted to bring the presser member 28 at a certain part of the range of its lateral movement, for example in a position at one side of the central portion of the cutting bed.

The presser member 28 is provided with a handle 112 upon its forward end for moving it into a desired position over the cutting bed. The lower or acting face of the presser member is formed by a plate 114 which may be adjusted vertically upon the presser member by an adjusting screw 116, as shown in Fig. 1.

In the use of the machine shown, a cutting die having been placed in desired position upon a skin supported by the cutting bed 10, the presser member 28 is swung by the operator into position above the die against the resistance of the spring 30. It will be found convenient to so adjust the spring 30 that the presser member is normally maintained thereby at the side of the cutting bed upon the left of the operator. The presser member 28 having been brought into proper position over the die and held there by one hand, the hand lever 80 is depressed by the other hand to bring into operation the power actuated means for depressing the presser member. The driving rod 68 is thus brought over the seat 72 in the plunger 46. In the next descent of the driving rod, which is in continual reciprocation, the shaft 26 and presser member 28 are depressed against the resistance of the spring 30. It will be observed that the downward movement of the presser member is opposed by a progressively increasing resistance of the spring 30. The momentum of the power actuated parts of the machine in the downward movement of the presser member is thus gradually diminished and is a minimum at the limit of the downward movement of the presser member. The movement imparted to the presser member is thus such that an excessive pressure upon the die does not occur. In the upward movement of the driving rod 68, the shaft 26 and plunger 46 are raised by the spring 30, following up the movement of the driving rod. In this portion of the operation of the machine the movement of the power actuated parts is accelerated by the expansion of the spring 30. In the rise of the plunger 46, the finger 86 carried thereby, which in the downward movement of the plunger has moved into position below the dog 82, raises said dog into its inoperative position shown in Fig. 7. As soon as the presser member reaches the limit of its upward movement the driving rod 68 moves out of contact with the seat 72, and said driving rod and the eccentric sleeve 66 are moved by the spring 74 into inoperative position wherein the driving rod moves idly within the plunger 46. The dog 82 is maintained in the position shown in Fig. 7 until the hand lever 80 is released by the operator when the parts return to the position shown in Fig. 5. After a dieing out operation has been completed, the presser member 28 is released by the operator and allowed to be moved to one side of the cutting bed by the spring 30. It will be observed that during the operation of the machine both hands of an operator are so occupied that he is prevented from interposing either of them in the path of any of the power actuated parts. As will be apparent from Fig. 1 the hand lever 80 is arranged at such a distance from the handle 112 upon the presser member that an operator is unable to manipulate both simultaneously with a single hand.

It will be observed that in the machine herein shown the means for yieldingly sustaining the presser member serves also as a means for moving the presser member over the face of the cutting bed. It will be obvious, however, that separate and independent means for performing these two functions may be provided without departing from the present invention.

By adjustment of the sleeve 40 in the plug 36 the normal tension of the spring 30 tending to raise the presser member may be varied. It will be observed that this feature permits the resistance offered to the power actuated means in its acting stroke to be varied and thus made of an amount suitable to secure the best results. For example, if the sleeve 40 is adjusted to draw down the cap plate 32 and apply an increased tension to the spring 30, the normal elevation of the plunger 46 and seat 72 is lowered so that movement is imparted to said plunger by the driving rod 68 during a smaller proportion of the acting stroke of the driving rod. The total resistance to the movement of the power actuated parts in the acting stroke of the driving rod is thereby reduced. The amount of movement imparted to the presser member is also reduced.

The arrangement of the plate 114 upon
the presser member for vertical adjustment permits variation in height of the cutting bed or of the die to be accommodated. It will be obvious that the construction shown whereby the plate 114 is vertically adjusted permits variation in the limit of downward movement of the acting face of the presser member.

It may be observed that variation in the amount of movement imparted to the presser member could be secured by varying the effective length of the driving rod 68, as by adjusting it vertically in the eccentric sleeve in which it is carried. Such an arrangement would also permit the amount of resistance offered to the power actuated parts in the actuating stroke of the machine to be varied. It will be understood that this arrangement falls within the scope of the present invention. It is desired to cover herein any construction or arrangement wherein the downward movement of the presser member effected by power actuated means is opposed by a resistance which may be varied in amount.

The tension of the spring 30 tending to move the presser member laterally over the cutting bed may be varied by adjustment of the plug 36. It will be understood that such adjustment may be found desirable in order to give the presser member a normal position best suited to the convenience of the operator. The construction shown is such that tension tending to move the presser member over the cutting bed may be applied to the spring 30 in either a righthand or a lefthand direction. It will be commonly preferred, however, to arrange the parts so that the presser member is maintained normally in a position at the side of the cutting bed upon the left hand of the operator.

It will be understood that variations in the construction and arrangement of parts from that shown may be made without departing from the present invention. It will be also understood that features of the invention may be employed in relations different from that shown and that all of the features above referred to need not be included in a machine embodying the present invention. The machine herein illustrated as an embodiment of the invention is shown by way of example and not by way of limitation.

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

1. In a machine of the class described, the combination with a cutting bed, of a presser member arranged for movement over the face of the bed and also for movement toward and from the bed, means for depressingly sustaining the presser member, power actuated means for depressing said presser member, and means for adjusting relatively said presser member and said power actuated means to permit a variable portion of the acting stroke of said power actuated means to be made effective to impart movement to the presser member against the resistance of said sustaining means.

2. In a machine of the class described, the combination with a cutting bed, of a presser member arranged for movement over the face of the bed and also for movement toward and from the bed, means for depressing and raising said presser member and means for varying the amount of movement imparted to said member.

3. In a machine of the class described, the combination with a cutting bed, of a presser member arranged for movement over the face of the bed and also for movement toward and from the bed, means for depressing and raising said presser member, means for varying the amount of movement imparted to said member and means for varying the limit of downward movement of said member.

4. In a machine of the class described, the combination with a cutting bed, of a presser member arranged for movement over the face of the bed and also for movement toward and from the bed, means for depressing and raising the presser member and means for varying the upper limit of movement of said member without varying the limit of its downward movement.

5. In a machine of the class described, the combination with a cutting bed, of a presser member arranged for movement over the face of the bed and also for movement toward and from the bed, means for depressing said member comprising a driving member arranged for movement in an approximately vertical direction, means for bringing said presser member and driving member into operative relation, means for raising said presser member, and means for limiting its upward movement arranged for adjustment whereby a variable portion of the acting stroke of the driving member may be made effective to impart movement to the presser member.

6. In a machine of the class described, the combination with a cutting bed, of a presser member arranged for lateral movement over the face of the bed and also for movement toward and from the bed, means for depressing and raising the presser member and means for yieldingly maintaining said presser member normally at a predetermined part of the range of its lateral movement.

7. In a machine of the class described, the combination with a cutting bed, of a presser member arranged for lateral positioning movement over the face of the bed about an axis at one side of the bed and also for movement toward and from the bed in the
different positions, means for depressing and raising the presser member and means for maintaining said presser member normally at a predetermined part of the range of its lateral movement.

8. In a machine of the class described, the combination with a cutting bed, of a presser member arranged for lateral movement over the face of the bed and also for movement toward and from the bed, means for depressing the presser member, and means for raising said member constructed to maintain the member normally in a position at one side of the cutting bed.

9. In a machine of the class described, the combination with a cutting bed, of a presser member arranged for lateral positioning movement over the face of the bed and also for movement toward and from the bed in the different positions, means for depressing the presser member and means for raising said member constructed to move said member out of the selected position over the bed in which it has been depressed.

10. In a machine of the class described, the combination with a cutting bed and a presser member arranged for lateral movement over the face of the bed and also for movement toward and from the bed, means for depressing and raising the presser member, and a spring for moving the presser member laterally over the cutting bed from operative position above a die previously acted upon by said presser member.

11. In a machine of the class described, the combination with a cutting bed, of a presser member arranged for lateral movement over the face of the bed and also for movement toward and from the bed, means for depressing and raising the presser member, and means for moving the presser member laterally over the cutting bed, and means for varying the amount of lateral movement imparted to said presser member.

12. In a machine of the class described, the combination with a cutting bed, of a presser member arranged for lateral movement over the face of the bed into and out of different operative relations to the bed, means for depressing and raising the presser member, and means for yieldingly maintaining said presser member normally at a predetermined part of the range of its lateral movement constructed to return said member to its position of rest from any of the operative positions into which it may be moved.

13. In a machine of the class described, the combination with a cutting bed, of a presser member arranged for lateral positioning movement over the face of the bed and also for movement toward and from the bed in the different positions, means for depressing and raising the presser member and means rendered operative by the movement of the presser member into a selected position over the bed for moving the presser member out of the said position after it has been depressed and raised.

14. In a machine of the class described, the combination with a cutting bed, of a presser member arranged for lateral positioning movement over the face of the bed about a vertical axis at one side of the bed and also for movement toward and from the bed in the different positions, means for depressing and raising the presser member and a spring tensioned by the movement of the presser member into a selected position over the bed for moving the presser member out of the said position after it has been depressed and raised.

15. In a machine of the class described, the combination with a cutting bed, of a presser member arranged for movement over the face of the bed and also for movement toward and from said bed, means for moving said presser member toward the bed including a driving member arranged for continuous reciprocation and normally out of operative relation to the presser member, means for moving the presser member away from the bed, means under the control of the operator for rendering said driving member effective to impart movement to the presser member and automatic means for restricting the movement of the presser member to a single reciprocation.

16. In a machine of the class described, the combination with a vertical shaft guided for vertical sliding movement upon the machine frame and arranged for rotary movement about a longitudinal axis, a presser member secured to said shaft and projecting laterally therefrom, a vertical plunger guided for vertical movement on the frame restrained from rotary movement thereon and arranged to transmit pressure to the shaft, means arranged to have engagement with a predetermined portion of said plunger for depressing said shaft and presser member, and means for raising the shaft and the presser member.

17. In a machine of the class described, the combination with a cutting bed, of a presser member arranged for movement over the face of the bed and also for movement toward and from the bed, a device upon the forward end of said presser member for manually moving the presser member into a desired position over the bed, mechanism for automatically depressing and raising said presser member and manually operated controlling means for said mechanism spaced from said device a sufficient distance to prevent said device and said controlling means from being manipulated simultaneously with a single hand.
18. In a machine of the class described, the combination with a cutting bed of a presser member arranged for manual movement over the face of the bed into a desired position over the bed, and also for movement toward and from the bed, mechanism for automatically depressing and raising said presser member and manually operated controlling means for said mechanism spaced from said presser member a sufficient distance to prevent the presser member from being manually moved and the controlling means from being manipulated simultaneously with a single hand.

19. In a machine of the class described, the combination with a cutting bed and a presser member arranged for movement over the face of the bed about a vertical axis upon the side of the bed remote from the operator, mechanism for automatically depressing and raising said presser member and manually operated controlling means for said mechanism arranged above the presser member and at a point remote from its forward end.

20. In a machine of the class described, the combination with a cutting bed, of a supporting frame therefor, a laterally movable presser member, a cylindrical support for the presser member arranged in a vertical bearing in the frame below said presser member and provided with a tubular upper end, a vertical bearing above the tubular upper end of the support and a member arranged in said upper bearing and provided with a cylindrical lower end inserted within the upper end of the support to form an upper bearing for said support.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SOCRATES KEATS.

Witnesses:
E. N. LEWIS,
GEORGE LESTER.