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PRESS FOR CUTTING OR PUNCHING SHEET MATERIAL

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2 Sheets-Sheet 1

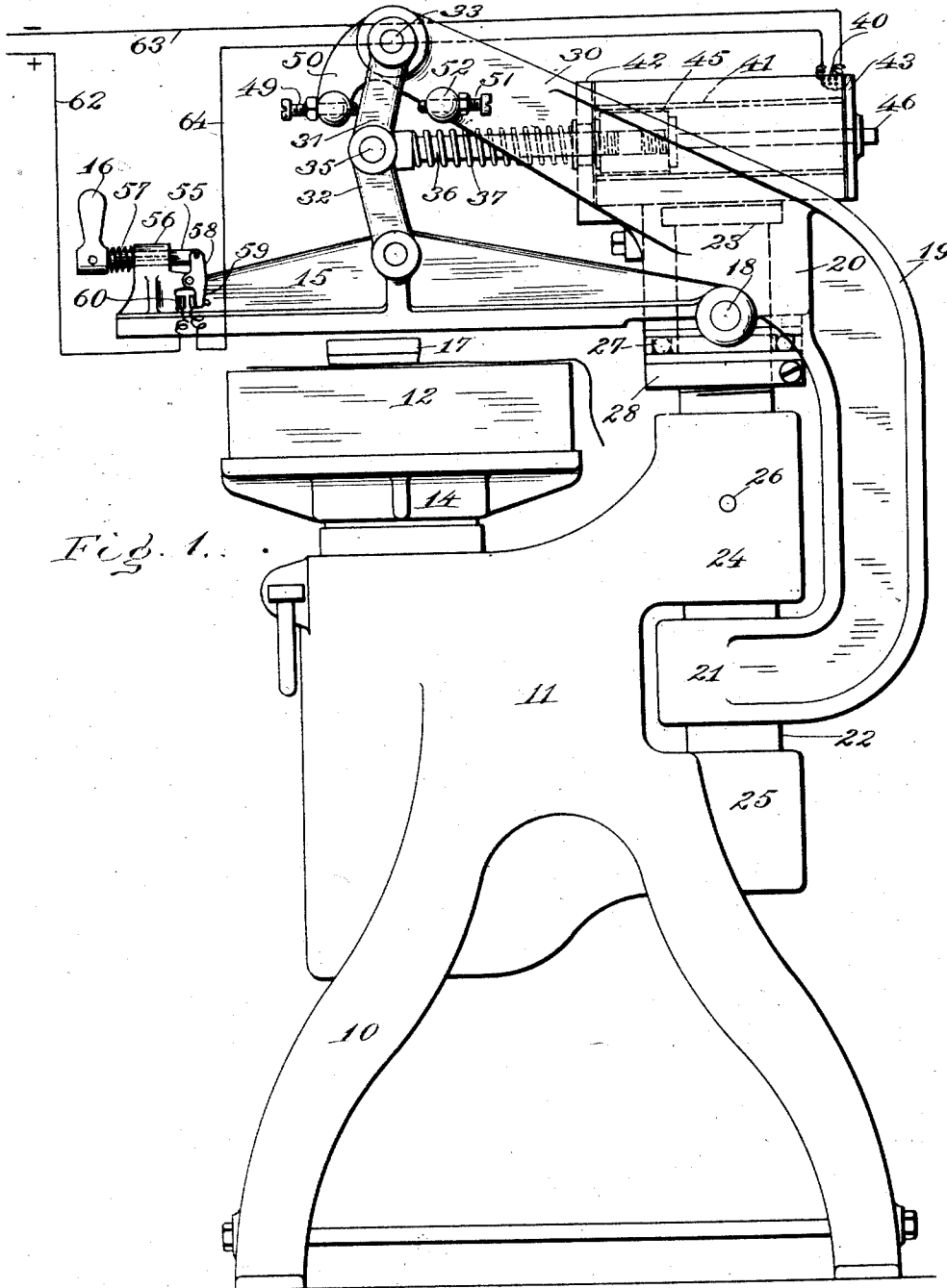


Fig. 1.

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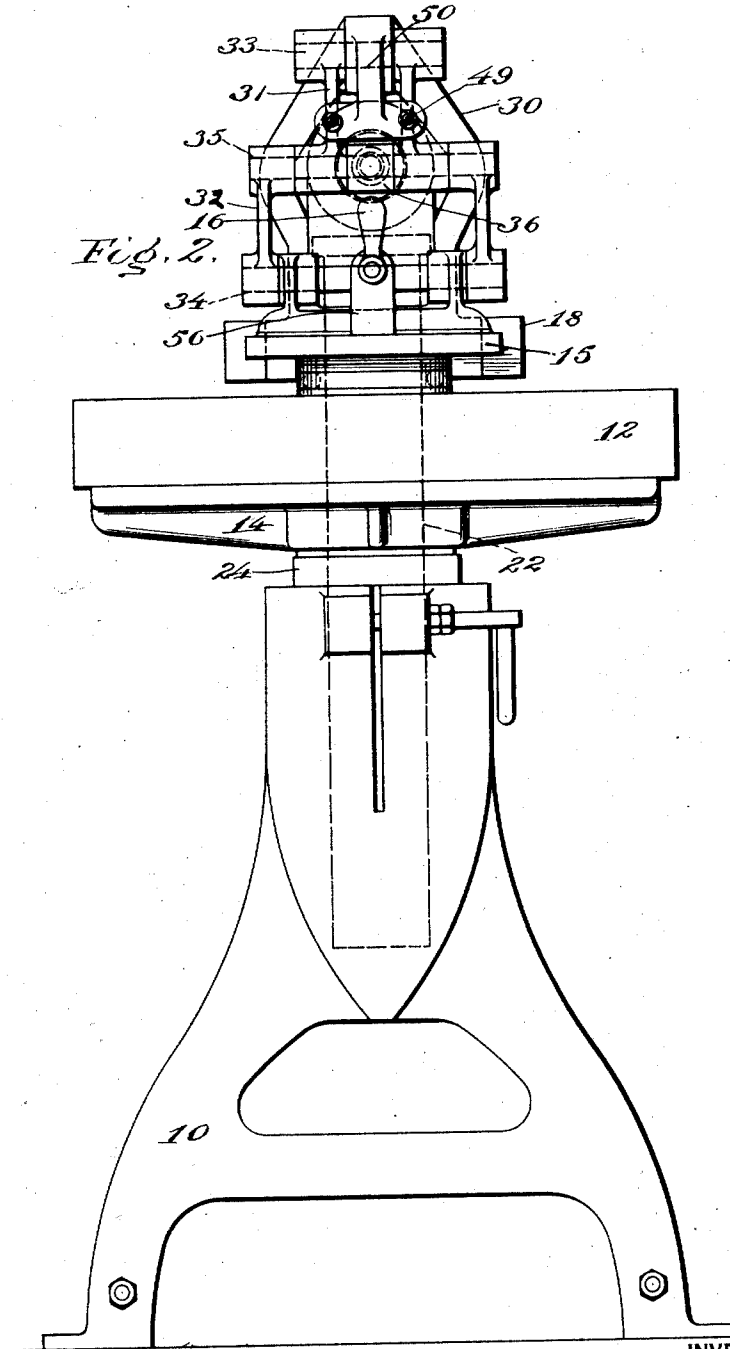
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UNITED STATES PATENT OFFICE.

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PRESS FOR CUTTING OR PUNCHING SHEET MATERIAL.

Application filed November 23, 1926. Serial No. 150,260.

This invention is a novel press for cutting or punching sheet material, and while the principles of the invention might be employed in various types of presses for such purposes, the same are herein shown applied illustratively to a type of press adapted more especially for the purpose of dieing out leather or similar sheet material to produce the constituent parts of various articles, such as the uppers of boots and shoes.

The invention is particularly adapted for, and herein shown applied to, a press which, like prior Patents No. 1,228,834 of June 5, 1917 and No. 1,295,931 of March 4, 1919, embodying a heavy frame carrying a flat bed for supporting the leather and an overhanging presser adapted to descend upon a loose die placed selectively upon the material and thus force the die through the material, and the overhanging presser or head being fitted so that it may swing laterally into and from position enabling clear inspection of the work between cutting operations; such machines being generally known in the trade as clicking machines.

A general object of the present invention is to improve the efficiency, convenience and output of presses of the class and type referred to. A particular object is to obviate one of the defects of the usual clicking machine in that the heavy presser head being brought down abruptly upon the die tends to cause undue vibrations and noise, resulting sometimes in damage or danger as well as annoyance. A further object is to afford a press of relatively light construction and adapted more particularly for cutting out the thinner articles or components of shoes not requiring a heavy abrupt blow.

Other and further objects and advantages of the invention will be explained in the following description or will be apparent to those conversant with the subject. To the attainment of the above referred to objects and advantages the present invention consists in the novel press or cutting machine, and the novel features of combination, arrangement, mechanism and detail herein illustrated or described.

In the accompanying drawings disclosing one form in which the invention may be embodied, Fig. 1 may be described as a right elevation of the machine, the operator being supposed to stand at the left side of the figure for manipulation of the leather, the die, the

presser head and the controlling mechanism.

Fig. 2 is a front elevation of the machine shown in Fig. 1.

The present invention may be said to comprise the combination of certain elements including the bed or block carried by the frame and on which the leather is spread, the presser or head overhanging the bed and mounted on a rear support which is swivelled about a vertical axis so that the presser can be swung to right and left over the bed, with the presser and rear support so connected or arranged as to permit up and down movements of the presser, the presser for this purpose being preferably swingingly connected to the rear support to permit tilting downward and upward movements, and the rear support having an upward or overhead extension, with a pressure multiplying mechanism, preferably a toggle device, between the overhead extension and the presser head for forcing the latter downward toward the die and bed in any swung position of the presser. This general plan of structure and operation may be embodied, in various forms. The presser is readily swung into selected position by hand, which is preferable, although it might be done by power. The overhead toggle is a very effective means for forcing or tilting the presser downwardly upon the die, it being understood that the presser will be parallel with the bed while in contact upon the die. The toggle action gives a thrust in the nature of a blow, but without the abrupt shock delivered by the bodily blow of the usual clicking machine presser. The inertia of the presser head which is relied upon in the usual clicker is largely replaced herein by the powerful or multiplied force of the toggle, a characteristic of which is that as the toggle comes into straightness it delivers its maximum force, whereas the actual speed of the thrust part is on the decrease, so that the downward throw of the presser is substantially mechanically terminated at the point where the cutting is completed, and undue shock upon the cutting block or bed is obviated. Equivalents of the toggle device, having the same advantages and action, could be substituted, and the toggle can be actuated in various ways. Thus the straightening of the toggle to throw down the presser might be performed by mechanical connections from a power shaft, but it is an advantage of this invention that such thrusting means could be

operated otherwise for example by pneumatic, hydraulic or magnetic means, and my preferable plan is to employ magnetic means to operate the toggle, as herein specifically illustrated.

Above the supporting legs 10 is firmly mounted the main frame 11 constituting a support for the movable elements of the press. Above the forward part of the frame 10 is the bed or cutting block 12 which may consist of wood suitably clamped and held as in said prior patents at the top of a solid support 14 which may be vertically adjustable in the frame to determine the height of the bed in relation to the die and the presser.

The swinging presser or head 15 is arranged to overhang the bed and the presser is shown provided with a handle 16 at its forward or free end, this being available and convenient for effecting the bodily lateral swinging of the presser to and from its position over a loose die 17 resting upon a hide or piece of leather on the bed.

The presser or head 15 is preferably mounted for tilting down and up movements and for this purpose is shown fulcrumed at 18 to a rotary or swivelled support 19. This support may for example be mounted to rotate on a vertical axis by means of an upper bearing 20 and a lower bearing 21, these turning freely on a vertical cylinder or bearing post 22. This post at its upper end is formed with a shoulder 23 to hold down the rotary support. The post preferably is held against rotation in upper and lower frame extensions or bearings 24 and 25, through one of which is shown a pin or bolt 26 holding the post against vertical and rotary movement. The weight of the rotary support 19 may be taken by a thrust bearing 27 resting upon a collar 28 secured to the post. By the described arrangements the presser 15 is capable of swinging laterally over the bed and of tilting downwardly toward the bed and die and returning upwardly to the normal position shown.

The means for supporting the weight of the presser 15 and for effecting its actuation may consist of power operated mechanism between the presser and an extension of the rear swivelled support 19. Such extension is preferably in the form of a rigid arm 30 extending upwardly and forwardly from the rear support. Between the overhead extension 30 and the presser is shown a pair of toggle links 31, 32, the upper link pivoted at 33 to the extension arm 30 and the lower link pivoted at 34 to the presser, the two links pivoted to each other centrally at 35. In the drawings the two links are shown in bent condition, so that the presser is slightly elevated above the die 17. By straightening the links the presser is thrown down to produce its desired actuation. From the central pivot 35 is shown extending an operating rod

36, the rear end of which is suitably guided, and this rod is surrounded by a spring 37 of sufficient strength normally to bend the toggle and lift the presser to the position shown.

The means for forcing the toggle into straight condition to depress the presser is shown as magnetic means or a solenoid comprising the annular coil 40 surrounding a sleeve 41 which may be of iron. At the front end of the solenoid is a vertical end plate or disk 42 which may constitute a guide for the longitudinal movements of the operating rod 36, and at the rear end of the solenoid is shown a disk 43. The solenoid core consists of a cylindrical block 45 of iron mounted at the rear end of the rod 36, and to the rear of the core is shown a brass tail rod 46 which may extend centrally through the disk 43 for guidance. These described parts are mounted on the swivelled rear support 19, so that said support, in its swinging movements carries the presser and its actuating mechanism and the source of power, giving the desirable pressing action already described and with great simplicity as all moving parts are carried on the rotary support.

Preferably the described toggle linkage is arranged in a symmetrical manner as disclosed in Fig. 2. Thus there are duplicate links 31 and duplicate links 32, while the central pivot 35 is an elongated axle at the center of which is the head of the operating rod 36. It is desirable to provide stops for both extreme positions of the described parts, and this may conveniently be done by means of a forward stop 49, or rather a pair of them, each consisting of an adjusting screw extended through one of the arms of an inverted T bracket 50. A rearward stop means may consist of opposite stop screws 51 threaded into bosses 52 standing out at the two opposite sides of the overhead extension 30. In the normal position shown the upper links 31 bear against the forward stops while the presser is in its upper position, while when the presser is thrown down by the pull of the solenoid upon the core 45 this motion will be terminated by the links 31 contacting the rear stops 51.

The described operating mechanism may be simply and conveniently controlled from the same handle 16 through which the lateral swinging movements are given to the presser. For this purpose the handle is shown standing upwardly from a square shank or bar 55 sliding rearwardly and forwardly in a lug 56 at the top side of the free end of the presser, a spring 57 pressing the handle forward to the normal position shown. Pivoted to the rear end of the shank 55 is shown a swinging lever 58 centrally pivoted to the shank and having at its lower swinging end an insulated contact 59 arranged opposite to a similar contact mounted on the lug 56. After the presser 15 has been swung to a desired position by the

handle 16, the latter may be thrust rearwardly, thus bringing together the contacts 59 and 60. These contacts may be part of a circuit including also the solenoid 40. Line 5 wires 62 and 63 are shown, the former leading to the contact 60 and the latter to the solenoid 40, while a conductor 64 extends from the contact 59 to the other terminal of the solenoid. This diagrammatic illustration is representative of many convenient electrical arrangements for controlling the operation.

In operation the presser is swung to position by the handle 16 and the latter is then thrown rearwardly thus causing the solenoid and connected mechanism to operate to throw 15 down the presser, which will be released when the handle is released, to permit the spring 37 to restore the parts to normal position. The control handle, it will be noticed, is thrown 20 rearwardly rather than downwardly to effect the actuation. If thrown downwardly the resulting descent of the presser might impair the control, therefore the handle motion is other than downward and might be upward, 25 but is illustratively shown as rearward.

There has thus been described a press for cutting or punching leather or similar sheet material to produce predetermined shapes by means of dies driven through the material, the 30 same embodying the principles and attaining the advantages of the present invention. Various matters of combination, arrangement, mechanism and detail may be modified without departing from the underlying principles. 35 Therefore it is not intended to limit the invention to the particular features disclosed except to the extent set forth in the appended claims.

What is claimed is:

40 1. In a press for cutting or punching leather or other sheet material, a bed for supporting the material, a presser overhanging

the bed, a rear support swivelled to permit lateral swinging movements of the presser and having the presser swingingly mounted thereon for down and up movements, said swivelled support having an overhead extension to a point above said bed, and power operated mechanism between said extension and presser for thrusting upwardly on the extension and 50 downwardly on the presser to force the latter toward the bed in any swung position of the presser.

2. In a press for the die cutting of leather or like sheet material, a flat bed for supporting the leather, a presser overhanging the bed, a rear support swivelled about an upright axis and having the presser mounted thereon for tilting movements to and from the bed, an overhead extension of said support above 60 the bed and presser, a toggle device between said extension and presser, comprising vertically arranged toggle links above the presser, with power means to straighten the toggle to depress the presser, and with stops for the extreme position of the toggle, and resilient means to restore the toggle to bent condition when the thrust is removed.

3. In a press for die cutting leather or other sheet material, a flatwise bed for supporting 70 the leather, a presser overhanging the bed, a rear support swivelled about an upright axis and having the presser mounted thereon for tilting movements to and from the bed, an overhead extension of said support above the presser, a toggle device between said extension and presser for thrusting the latter toward the bed in any swung position of the presser, comprising toggle links above the presser, and an electric solenoid to straighten 80 the toggle to depress the presser.

In testimony whereof, I have affixed my signature hereto.

JOHN R. OLIVER.