

Dec. 15, 1936.

W. J. LOFSTEDT

2,064,172

PLATE SHAVING MACHINE

Filed Sept. 1, 1934

2 Sheets-Sheet 1

FIG. 1.

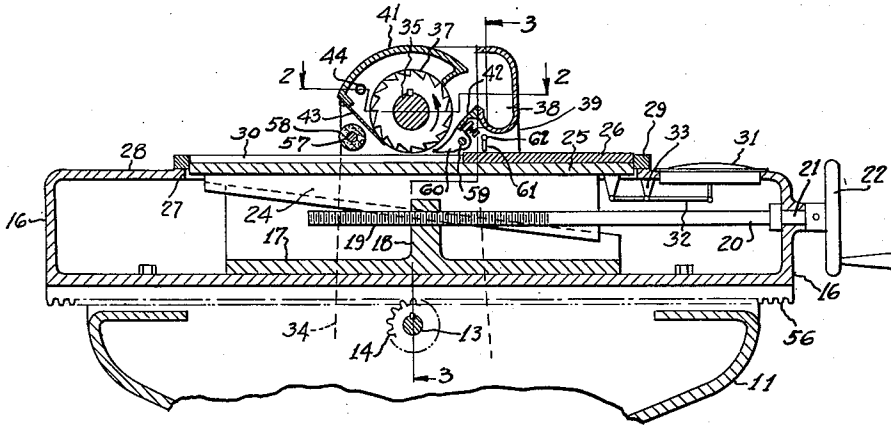


FIG. 2.

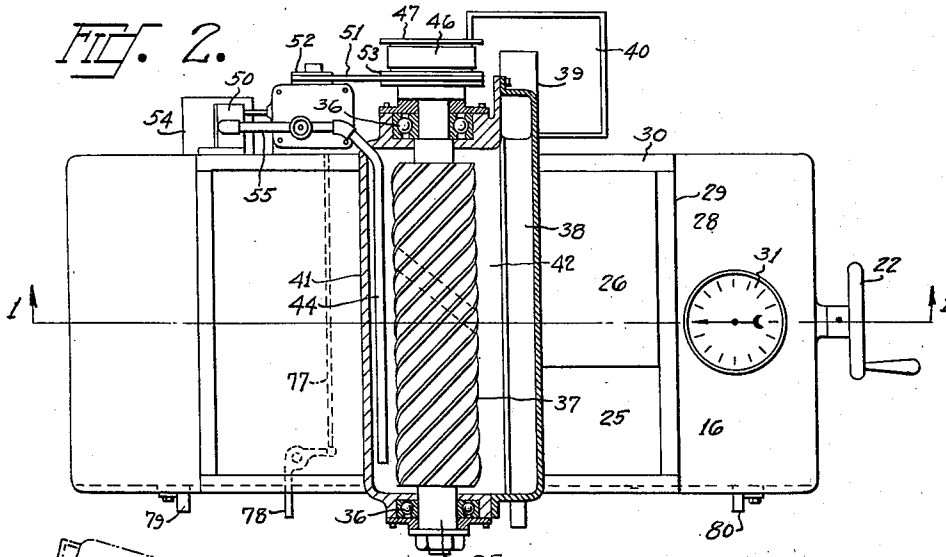


FIG. 3.

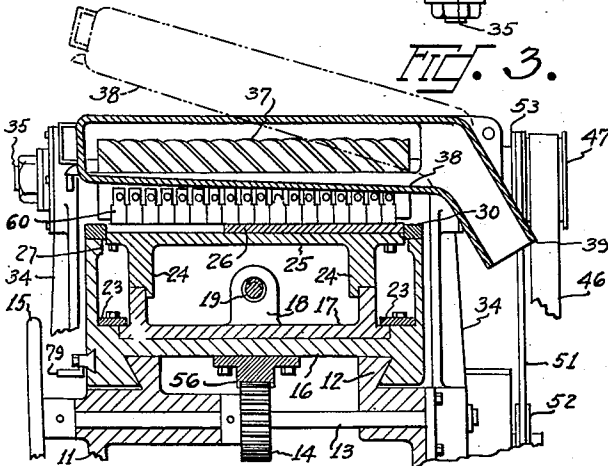
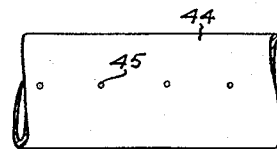


FIG. 4.



INVENTOR
W. J. LOFSTEDT

BY *E. B. Birkhead*
ATTORNEY

Dec. 15, 1936.

W. J. LOFSTEDT

2,064,172

PLATE SHAVING MACHINE

Filed Sept. 1, 1934

2 Sheets-Sheet 2

FIG. 5.

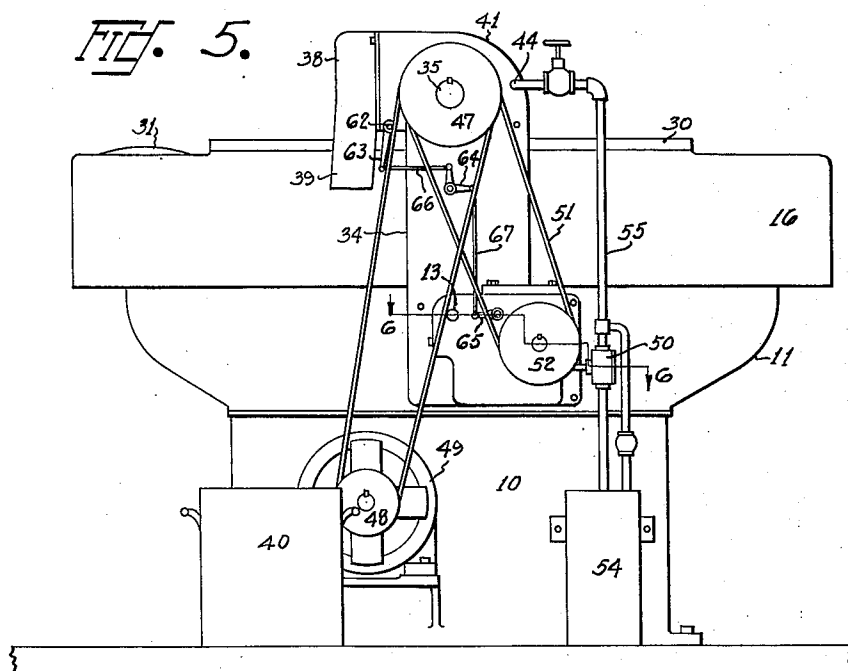


FIG. 6.

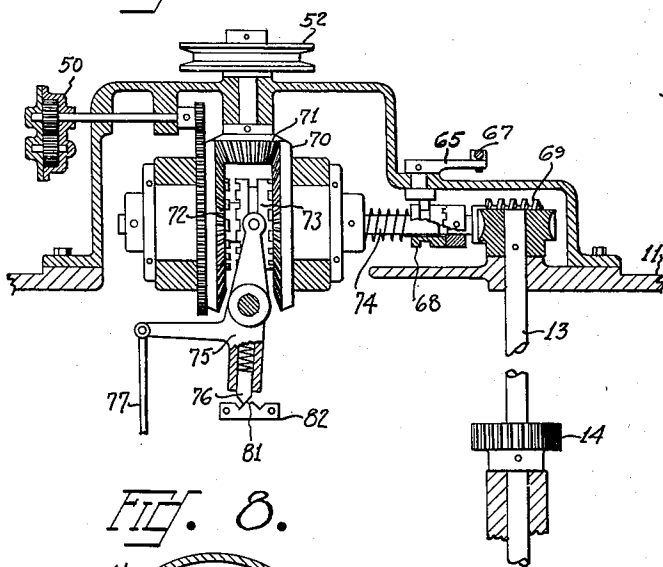


FIG. 7.

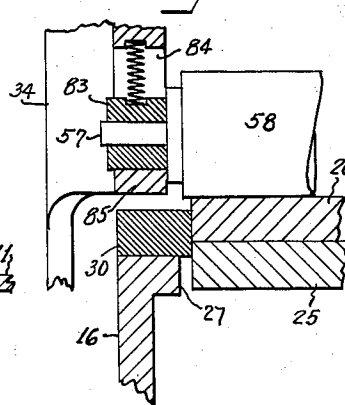
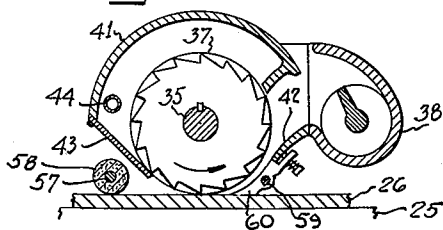


FIG. 8.



INVENTOR
W. J. LOFSTEDT
BY *E. B. Birkhead*
ATTORNEY

UNITED STATES PATENT OFFICE

2,064,172

PLATE SHAVING MACHINE

William J. Lofstedt, Portland, Oreg., assignor to
Premier Manufacturing & Sales Company,
Portland, Oregon

Application September 1, 1934, Serial No. 742,378

8 Claims. (Cl. 90—18)

This invention relates generally to the printer's art, and particularly to a machine for shaving plates.

The main object of this invention is the provision of a simplified form of plate shaving machine which will quickly and accurately reduce the thickness of a plate to a desired dimension.

The second object is to utilize a helical high speed steel cutter with continuous knives which are guttered to throw the chips into a receptacle, the knives having a helical angle adapted to move the chips laterally toward a point of discharge.

The third object is the provision of a special form of cutter which will render unnecessary the usual form of hold-down clamps commonly employed on shaving machines.

The fourth object is the use of a spring vibration absorbing composition roller.

The fifth object is the provision of an oil jet pipe for supplying an oil vapor to the cutter knives.

The sixth object is to so mount the plate upon the bed that it is urged in a diagonal direction against a pair of stops, requiring only flexible spring-hold downs which engage the plate as it passes through the machine.

The seventh object is to provide an automatic cut-out which will limit the depth of a cut which can be made at a single operation.

The eighth object is to provide an indicator dial having micrometer readings in the various systems of measurement—that is, in decimal fractions of an inch of the metric system or in printer's measure with accented markings for standard thickness of electros, 11 points, stereo base, electro base, zinc base and type-high.

The ninth object is to provide a forwarding and reversing bed lever by means of which the bed is moved in either direction, and additional means is provided for automatically stopping the bed at either limit of travel.

The tenth object is to provide a hand wheel for the complete forward or backward movement of the bed for use on small work when the full return stroke of the bed is not necessary.

These, and other objects, become more apparent from the specification following as illustrated in the accompanying drawings, in which:

Fig. 1 is a vertical section taken along the line 1—1 in Fig. 2.

Fig. 2 is a horizontal section taken along the line 2—2 in Fig. 1.

Fig. 3 is a vertical section taken along the line 3—3 in Fig. 1.

Fig. 4 is an enlarged detail of the oil spray pipe.

Fig. 5 is a rear elevation of the machine.

Fig. 6 is a section taken along the line 6—6 in Fig. 5.

Fig. 7 is a section through the felt roller bearing.

Fig. 8 is a vertical section through an alternative form of the device showing the screw conveyor for removing the chips.

Similar numbers of reference refer to similar parts throughout the several views.

Referring in detail to the drawings, there is shown a pedestal 10 upon whose base 11 is formed a dove tailed guide 12 which extends along the length of the base 11. Journaling in the base 11 is a horizontal shaft 13 near the middle of which is secured a pinion 14, and on the outer end of which is secured a hand wheel 15.

On the guide 12 is mounted a slide 16. Within the slide 16 is mounted the slidable wedge 17 through whose up-standing portion 18 is secured the threaded end 19 of the bed plate elevating screw 20 whose opposite end 21 journals in the slide 16. The screw 20 is provided with a hand wheel 22 by means of which the position of the wedge 17 can be adjusted. The wedge 17 is held in position by means of the plates 23.

Resting on the wedge 17 are the inclined ribs 24 which are formed on the under side of the bed plate 25, upon which rests the electro-type plate or its equivalent 26.

The bed plate 25 lies within an opening 27 formed in the top 28 of the slide 16. End stops 29 and side stops 30 are secured on the upper side of the top 28 around the opening 27.

An indicating gage 31 is mounted in the top 28 adjacent to the hand wheel 22. The lever 32 is pivoted on the support 33 which depends from the under side of the top 28. One end of the lever 32 is connected to the gage 31 and the other end thereof is connected to the bed plate 25, affording thereby a means for indicating the elevation of the bed plate 25, or rather the dimension of the shaved base after it passes under the cutter.

One the base 11 are formed the upright supports 34, across the upper ends of which journals the cutter shaft 35 in the anti-friction bearings 36. The cutter 37, which is secured on the shaft 35, is distinguished from the ordinary milling cutter by its greater helix angle, the purpose of which is to throw the chips laterally into the trough 38 from whence they can find their way into the

outlet chute 39 and into the receptacle 40. A hood 41 is disposed over the cutter 37.

Between the trough 38 and the cutter 37 is formed an inclined plate 42 which deflects the chips and guides them into the trough 38. Opposite the plate 42 and joined to the hood 41 is a plate 43. On the under side of the hood 41 and above the plate 43 is an oil spray pipe 44 provided with very small outlet holes 45 through which an oil vapor is forced upon the cutter 37 toward the shaving operation. Rotation is supplied to the cutter 37 by means of the belt 46 and pulleys 47 and 48 from the motor 49.

A gear pump 50 is driven by the belt 51 through the pulleys 52 and 53, the latter of which is secured on the shaft 35. The pump 50 supplies oil from the well 54 through the pipe 55 to the oil spray pipe 44.

On the under side of the slide 16 is formed a rack 56 which meshes with the pinion 14. On the under side of the plate 43 and journaling in the supports 34 is a shaft 57 which carries a felt roller 58, the purpose of which is to dampen vibrations which may occur in the electro-type plate 26 being shaved.

Underneath the plate 42 is the horizontal shaft 59 on which are rockably mounted a plurality of spring-urged chip deflector arms 60 whose lower ends yieldably engage the shaved surface of the plate 26.

Underneath the trough 38 is a trip arm 61 which is mounted on the rock shaft 62 and, through the levers 63, 64 and 65 and the connecting rods 66 and 67, are utilized to actuate a jaw clutch 68 which is interposed between the worm drive 69 for the shaft 13, and the bevel gear 70 which is driven from the pinion 71 which, in turn, is driven by the pulley 52. The pulley 52 (as shown in Fig. 6) also drives the gear 72 which drives the gear pump 50.

The lower end of the trip arm 61 is set at a predetermined distance above the lowermost edge of the cutter 37. For example, if it is determined that the maximum cut to be taken at a single operation is one hundred and twenty-five thousandths, this represents the distance between the bottom of the trip 61 and the bottom of the cutter 37, so that if an attempt is made to take a heavier cut—that is, feeding a plate of a thickness which will engage the trip 61, the jaw 68 will be withdrawn and the feed through the pinion 14 stopped.

It is desirable to make the trough 38 hinged, permitting it to assume the position shown in dotted lines in Fig. 3, to expedite the removal of chips therefrom and to give access to the cutter 37, and other parts.

While the pump 50 is driven continuously in one direction it is of course desirable to rotate the shaft 13 in either direction. This is accomplished by interposing the reversing clutch jaw 73 which is splined on the shaft 74 and can be brought into a driving relationship with either of the gears 70 or 72 by means of the bell crank lever 75 which is urged to either of its extreme positions by means of the spring-urged plunger 76. The bell crank lever 75 is operated by a connecting rod 77 from the bell crank lever 78.

To the slide 16 is adjustably attached the trip arm 79. A corresponding trip arm 80 is disposed at the opposite end of the slide 16. Either of the trip arms 79 or 80, by engaging the bell crank lever 78, can move the plunger 76 to the central notch 81 of a stationary incline block 82 which will bring the feed mechanism to a rest, where

it will remain until it is reversed manually by moving the lever 78.

In Fig. 7 is illustrated the relation between the bed plate 25, electro-type plate 26 and the felt roller 58. It will be noted that the roller 58 journals in the slidable bearings 83 which are confined within the slots 84 formed in the extensions 85 projecting inwardly from the supports 34.

In the form of the device shown in Fig. 8 there is shown a conveyor screw 86 which is disposed within the trough 38, suitable driving mechanism (not shown) being provided for rotating the screw at a speed which is sufficient to cause it to remove the chips as they accumulate in the trough 38.

The operation of the device is as follows: Assuming that a plate 26 is to be shaved, the hand wheel 22 is first rotated until the gage 31 indicates the desired reading—that is, the thickness to which the plate is to be finished. The plate 26 is then placed against one of the lateral stops 30 and an end stop 29 and the lever 78 operated, causing the cutter 37 to be rotated at a high rate of speed while the plate 26 is advanced under the cutter and reduced to the desired thickness at one operation, leaving a smooth clean cut.

The angle of the cutter blades is such that the rapidly moving chips are deflected laterally toward the chute 39, the cutting action being greatly improved by the presence of the oil vapor which continually surrounds the cutter.

When the plate 26 is moved entirely past the cutter 37 the lever 78 engages the trip 79 and the entire machine comes to rest, and in order for the bed to be returned to its starting position the lever 78 must be operated manually, as previously stated.

It will be observed that no hold-down arrangements of any kind, or clamps are necessary in connection with the use of this device other than the yieldable arms 60 and the vibration absorbing felt roller 58.

The net result of the use of this machine is a great saving in labor and the production of a precisely finished product.

It will be noted that the action of the cutter itself tends to hold the plate upon the bed and the stops 29 and 30 alone prevent the movement of the plate 26 with relation to the bed plate 25.

I claim:

1. A plate shaving machine having in combination a vertically adjustable, horizontally slidable bed plate, an elongated cutter having continuous spiral blades formed thereon mounted over said bed plate, stops along one edge and one end of said bed plate and a vibration absorbing roller adapted to engage the finished surface of an electro-type plate as it emerges from said cutter.

2. A plate shaving machine consisting of a horizontal slide having a vertically adjustable bed plate mounted thereon, side and end stops mounted alongside of said bed plate, a cutter disposed over said bed plate, and a trip disposed in front of said cutter having operating connections to the cutter drive whereby an electro-type of excessive thickness will engage said trip before it can reach said cutter thereby stopping the operation of the machine.

3. A plate shaving machine as described in claim 2 in which the cutter is partially enclosed by a hood in which is disposed an oil spray pipe and a trough disposed alongside of said cutter for the collection of chips thrown out therefrom,

said trough having a hinged support at one end to facilitate the dumping of chips therefrom.

4. A plate shaving machine having in combination a horizontal slide, a bed plate vertically adjustable upon said slide, a driving means for moving said slide from one end of its travel to the other, manual means for reversing the movement of said slide, an elongated cutter mounted over said bed plate, yieldable fingers beneath which an electrotype plate must pass before engaging said cutter and a vibration absorbing roller yieldably mounted over said bed plate and adapted to ride upon the surface of said electrotype plate after it has been finished by said cutter.
5. A plate shaving machine having in combination a rotary spiral cutter having continuous flutes, a slide on the under side of said cutter having side and end stops fixed thereon, a bed plate vertically adjustable between said side and end stops, a trip arm mounted over said side stops adapted to be actuated by an object of excessive thickness and means for moving said slide under the control of said trip arm whereby a movement of said trip arm by an object of excessive thick-

ness will cause a stoppage in the movement of said slide.

6. A plate shaving machine having an elongated continuous spiral cutter, a bed plate disposed beneath said cutter and adjustable with relation thereto, side and end stops for said bed plate which are independent of said vertical adjustment, means for sliding said bed plate together with said side and end stops under said cutter and a vibration absorbing roller adapted to urge the finished electrotype plate against the bed plate as it emerges from beneath said cutter.

7. In a plate shaving machine, an elongated spiral cutter, a slide beneath the cutter, side and end stops movable with the slide, a support for the plates to be shaved, means for increasing and decreasing at will the distance between the cutter and the plate support so as to determine the depth of cut, and means for sliding as a unit, the slide, the stops, the support and the plates thereon.

8. The device of claim 7 plus means for deflecting the shaved chips upwardly and away from the cutter.

WILLIAM J. LOFSTEDT.