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ROUGHING MACHINE

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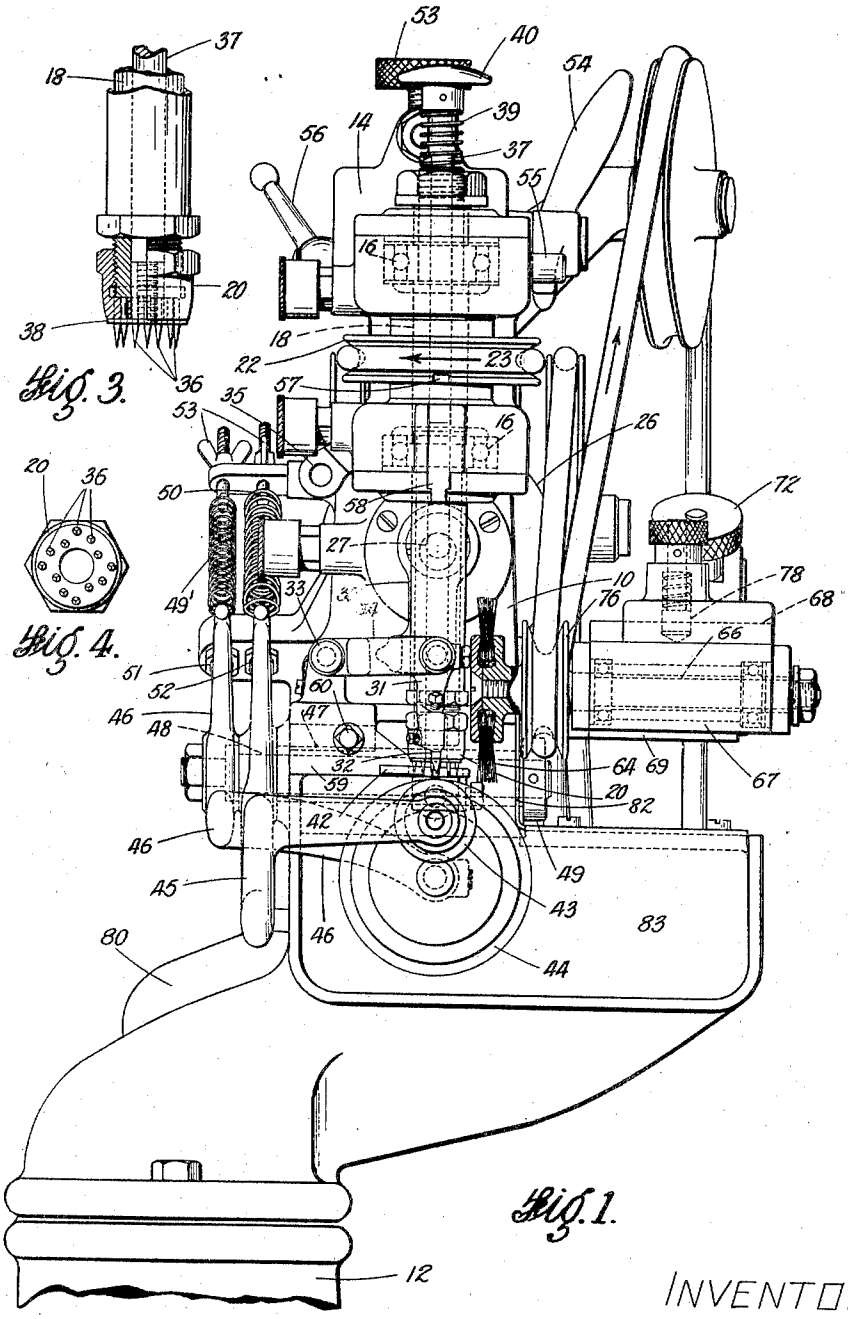


Fig. 3.

Fig. 4.

Fig. 1.

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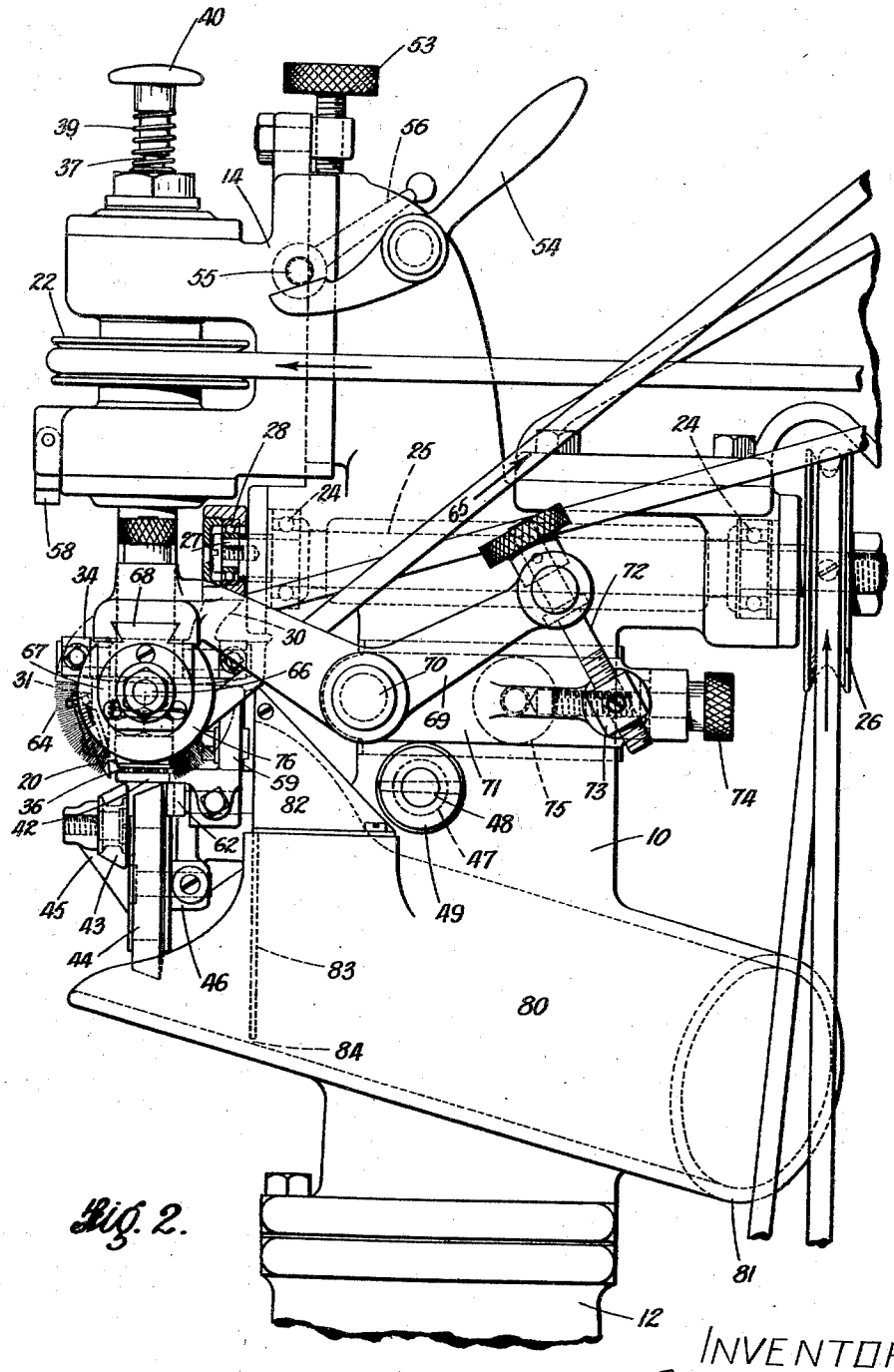


Fig. 2.

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ROUGHING MACHINE

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In Great Britain December 20, 1935

6 Claims. (Cl. 69—1)

This invention relates to the roughing of surfaces of sheet material of the nature of leather or the like and particularly to machines adapted for roughing the fresh surfaces of shoe soles to facilitate the cement attachment of such soles to shoe bottoms.

It is an important object of the invention to provide an improved machine by the use of which not only leather having a flesh surface of the usual character but also leather having a comparatively very hard flash surface may be successfully treated.

In this connection our improved machine includes, in combination with a rigid main roughing tool capable of operating successfully upon any kind of sole leather, an auxiliary tool, herein illustrated as a resilient wire brush, which acts to remove the ridge or shoulder at the junction of a beveled sole margin and the remainder of the sole, leaving a surface which can be effectively roughed over its entire width by the main tool.

Improved work-feeding mechanism is also provided and a feature of the invention consists in such a construction and arrangement of this mechanism that it can be easily and quickly removed from the vicinity of the roughing tool, in order to facilitate removal of said tool from its driving shaft. The auxiliary tool is likewise preferably so mounted that it can be quickly moved aside, leaving nothing to interfere with access to the main roughing tool which is itself arranged to be elevated to a position most advantageous for unobstructed manipulation when changing tools.

These and other features of the invention will be better understood and appreciated from a consideration of the following detailed description of a good, practical embodiment thereof, to be read in connection with the accompanying drawings in which

Fig. 1 is a view in front elevation of a sole roughing machine embodying the invention;

Fig. 2 is a side view;

Fig. 3 is a side elevation on a larger scale, partly in section, of the main roughing tool; and

Fig. 4 is an inverted plan view showing a preferred arrangement of roughing spikes.

Referring first to Figs. 1 and 2, a machine head frame 10 mounted upon a column 12 carries a vertically slidable carrier bracket 14 containing ball bearings 16 for a vertical shaft 18 at the lower end of which is carried a rigid, spiked roughing tool 20. The shaft 18 is rotated by a belt-driven pulley 22 in the direction indicated by the arrow 23 in Fig. 1. The frame 10 also carries bearings 24 for a shaft 25 which extends horizontally through the frame from front to rear and which is rotated by a belt-driven pulley 26. On the front end of the shaft 25 is an eccentric pin 27 carrying a bearing 28 for a connecting rod member 30 the lower portion of which half encircles the tool shaft 18 and carries, on a downwardly projecting portion 31 in front of the tool, a work-feeding point 32.

Pivoted to the member 30 at points behind and in front of the shaft 18 and pivoted to the frame 10 by a readily removable pin 33 is a semi-circular link 34 which guides the lower end of the member 30 and the feeding point 32 for movement in an elliptical path so as to feed a work-piece being operated upon by the tool 20 in short steps from right to left as viewed in Fig. 1.

When it is desired to remove a roughing tool from the shaft 18, the pin 33 may be pulled out to allow the member 30 and the link 34 to be turned (about the bearing 28) upward to one side of the shaft 18, the pin then being temporarily placed, while still passing through the link 34, in a hole 35 (Fig. 1) in the frame.

The construction of the spiked roughing tool is best shown in Figs. 3 and 4. Spikes 36, conveniently 12 in number and arranged as shown by Fig. 4 in three concentric circles (four spikes to each circle), are pressed into a sleeve nut which forms the body 20 of the tool arranged to be screwed upon the threaded lower end of the shaft 18 so that the upper ends of the spikes bear against the lower end surface of the shaft and are thereby prevented from moving upward in the nut while the tool is in use.

The shaft 18 is bored hollow and through the bore passes a rod 37 carrying at its lower end a plate or disk 38 perforated with holes corresponding to the spikes 36. The rod 37 is normally held upward so that the disk 38 abuts against the under side of the nut 20 by a spring 39 interposed between a nut at the upper end of the shaft 18 and a knob 40 secured to the upper end of the rod. The machine operator can depress the knob 40 when desired, even while the shaft 18 is rotating, to cause the disk 38 to clear from the spikes 36 any waste material, such as fibers from the work, which may have clung thereto. When in working position, as shown in Figs. 1 and 2, the spikes of the roughing tool project downward through a guard plate 42, constituting a depth gage, which is cut away so as closely to nearly surround the outermost ring of spikes, there being, however, no part of the plate directly between the spikes and the feeding point 32.

The work to be roughed is pressed against the under side of the plate 42 by two frusto-conical rolls 43, 44 which are of rubber or similar yielding material. These rolls are freely rotatable and are mounted, respectively, upon levers 45, 46.

The lever 45 is fixed upon a sleeve 47 which passes through a bore in the frame 10, thus providing a long pivot bearing for the lever and through this sleeve passes a stem 48 rigid with the lever 46, providing an equally long bearing for the lever 45. A collar 49 pinned upon the stem 48 holds both the sleeve 47 and the stem 48 in position against axial displacement in the frame. The levers 45, 46 are pulled by independent tension springs 49', 50 into contact with independent adjustable stop screws 51, 52 in a lug on the frame. By adjusting wing nuts 53 on threaded stems connected to the springs 49', 50 the force with which the rolls 43, 44, respectively, press against the under side of the work may be independently determined and by adjusting the stop screws 51, 52 the upper limits to which the rolls 43 and 44 may be drawn by the springs 49', 50 may be independently set.

The distance that the points of the spikes 36 project below the guard plate 42 and, consequently, the depth of the roughing, can be set by adjusting the carrier bracket 14 relatively to the frame 10 by means of an adjusting screw 53 (Fig. 2) threaded through a lug fixed to the bracket and pressing upon the frame. When it is desired, however, to change a roughing tool, the bracket 14 and shaft 18 may be bodily lifted by a hand lever 54, pivoted to the frame and engaging a stud 55 on the bracket. A threaded locking lever 56 serves to clamp the bracket 14 tightly against the frame, with the shaft 18 either in working position or raised for tool replacement.

The pulley 22 on the shaft 18 is provided with a notch 57 into which a latch 58 may be placed to lock the shaft against rotation when it is desired to remove or replace a roughing tool. The guard plate 42 is mounted on a bracket 59 which is fastened against the front of the frame by a screw 60. The under side of the plate 42 is, as indicated in Fig. 1, not exactly horizontal but slopes upward from right to left as seen in that figure. This allows the spikes 36 a deeper bite and greater roughing action on the work as each roughed region passes from the points at which it is supported by the rollers 43, 44.

As before indicated, these rolls are frusto-conical so that the work is engaged by their portions of larger diameter, which, as shown by Fig. 2, are the inner edges of the rolls. The work is guided by its edge contacting with an edge gage 62 (Fig. 2) and the inner edge of the roll 44 is arranged to press the work upward at a point close to this edge gage and under one margin of the area swept over by the spikes of the roughing tool. The roll 43 supports the work substantially under the other margin of the swept area, that is, the inner margin of the roughed area on the sole of which the margin is to be roughed, over a zone of width equal to the diameter of the circle described by the outermost of the spikes 36. The sole will be presented by the operator between the under side of the plate 42 and the rolls 43 and 44 and will forthwith be fed forward as previously indicated by the feeding point 32, engaging the flesh side of the sole close to the tool 20, the edge of the sole being urged against the edge gage 62 partly by the action of a brush 64, later to be described, and partly by the increased grip of the spikes upon the work as they move rearward toward the outer edge of the margin of the sole.

Soles requiring roughing often have beveled shank portions that have less thickness at the extreme edge than at the inner portion of the margin to be roughened. The pressure of the roll 44, acting as it does independently upon the outer edge of the roughed margin, maintains any such thinned outer margin of the work raised so as to be as thoroughly roughed by the tool spikes as a thicker, unbeveled portion. Furthermore, the downward pressure exerted by the work-feeding point 32 at a point nearer the middle of a sole than the roughed area tends also to lift the extreme edge of the work, the edge of the roll 43 acting as a fulcrum.

Mounted so as to engage the margin of a sole to be roughed before such margin passes under the guard plate to be acted upon by the spiked roughing tool described is an auxiliary tool consisting of a brush 64, conveniently of resilient wire and preferably with intermittently acting portions. This brush is mounted to rotate about a horizontal axis parallel to the line in which the work is fed by the feeding point 32 and in a direction to brush toward the edge of a sole held with that edge against the gage 62 (as indicated by the arrow 65 in Fig. 2). The brush 64 is carried on a shaft 66 having a belt-driven pulley 76 and mounted in bearings in a housing 67 held in a horizontal dovetailed guideway 68 upon the forward end of a lever 69 pivoted at 70 upon a slide 71 arranged for adjustment toward and away from the front of the machine. The elevation of the brush 64 may be set by adjusting a screw 72 threaded through a nut 73 pivoted upon the slide 71. The position of the brush toward and away from the front of the machine is set by adjusting a screw 74 threaded in the frame and passing through a lug in the slide 71 which may be locked to the frame 10 after adjustment by a screw 75. The housing 67 together with the shaft 66 and pulley 76 may be bodily slid laterally away from the roughing tool 20 when it is desired to provide clear space for changing a roughing tool. Such lateral sliding is provided for by a spring-pressed plunger 78 mounted in the forward end of the lever 69 the lower end of which plunger is normally engaged in a socket in the housing 67 but may be lifted manually to free the housing and allow it to be moved laterally on the slide 68.

The action of the brush 64 is to perform a preliminary operation upon a sole margin, such preliminary operation being of particular importance where soles having beveled shank portions are being treated. It sometimes occurs that in skiving such shank portions a definite ridge, or even a slight shoulder, is left at the junction of the cut of the skive with the flesh surface of a sole. The brush 64 serves in such instances to remove any ridge and leave a surface which can be effectively roughed over the whole width engaged by the spikes of a tool of the character of the tool 20. The brush 64, furthermore, tends to maintain a sole passing through the machine with its edge in contact with the edge gage 62.

The roughing of leather soles by such tools as the brush 64 and the spiked tool 20 inevitably produces some quantities of loose, fibrous dust. To provide for the withdrawal of such dust the lower part of the frame 10 is hollowed out to form a duct 80 the rear end 81 of which is connected to a suitable source of suction—conveniently a fan driven from a countershaft on

the machine. The upper part of the forward end of the duct 80 forms a mouth just behind the tool 20, one side of this mouth being closed by a plate 82. The lower part of the forward end of the duct is preferably almost closed by a baffle plate 83 so that the suction draft is concentrated not only at the open mouth behind the tool 20 but also along a narrow slot 84 below the edge of the baffle plate 83. Heavier particles of dust that fall into the front end of the duct in front of the plate 83 will be subjected to strong suction along this slot and will be thereby prevented from flying, even if they are not drawn through the slot.

Having described the invention what is claimed as new and desired to be secured by Letters Patent of the United States is:

1. In a roughing machine, a roughing tool adapted to operate upon the flesh side of a sole, and work feeding means arranged to engage the flesh side of the sole close to the point being operated on by the tool, said work feeding means being so mounted as to permit it readily to be removed manually from the vicinity of the tool to afford access to the latter.

2. In a roughing machine, a pair of roughing tools arranged close to each other to operate simultaneously in different directions upon closely adjacent portions of the work, and a movable mounting for one of said tools to permit it to be readily removed from proximity to the other tool, to afford access to the latter.

3. In a roughing machine, a spiked roughing tool, means surrounding the spikes for clearing waste material from the spikes, and means for moving said clearing means relatively to the spikes.

4. In a roughing machine, a spiked rotary roughing tool, a waste clearing plate surrounding the spikes and rotatable therewith, and means, manually operable while the tool and plate are rotating, for moving the plate relatively to the tool to clear waste material therefrom.

5. In a roughing machine, a roughing tool, a depth gage through which said roughing tool projects a predetermined distance to limit the depth of its roughing action, means for adjusting the extent to which the tool projects through the gage, and means for withdrawing the tool to a position remote from the gage to afford unobstructed access to the tool for replacing the same.

6. In a roughing machine, a roughing tool carrier movable between working position and a tool changing position remote therefrom, a roughing tool sustained by said carrier, and locking means for securing the carrier and tool in either of said positions.

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