April 30, 1929. J. GOULDBOURN 1,710,728

FINISHING MACHINE

Filed July 20, 1925 2 Sheets-Sheet 1

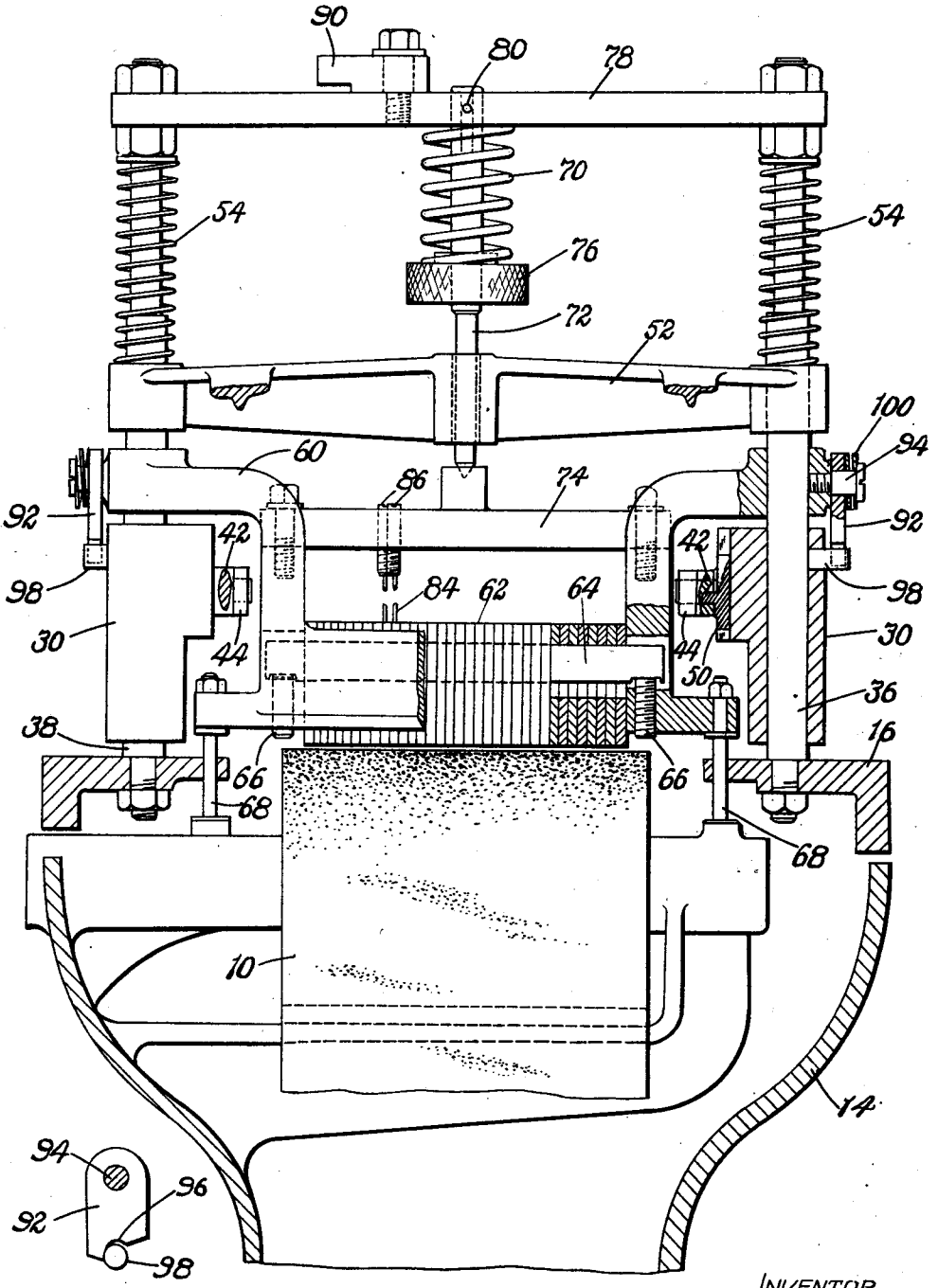


Fig. 3.

Fig. 1.

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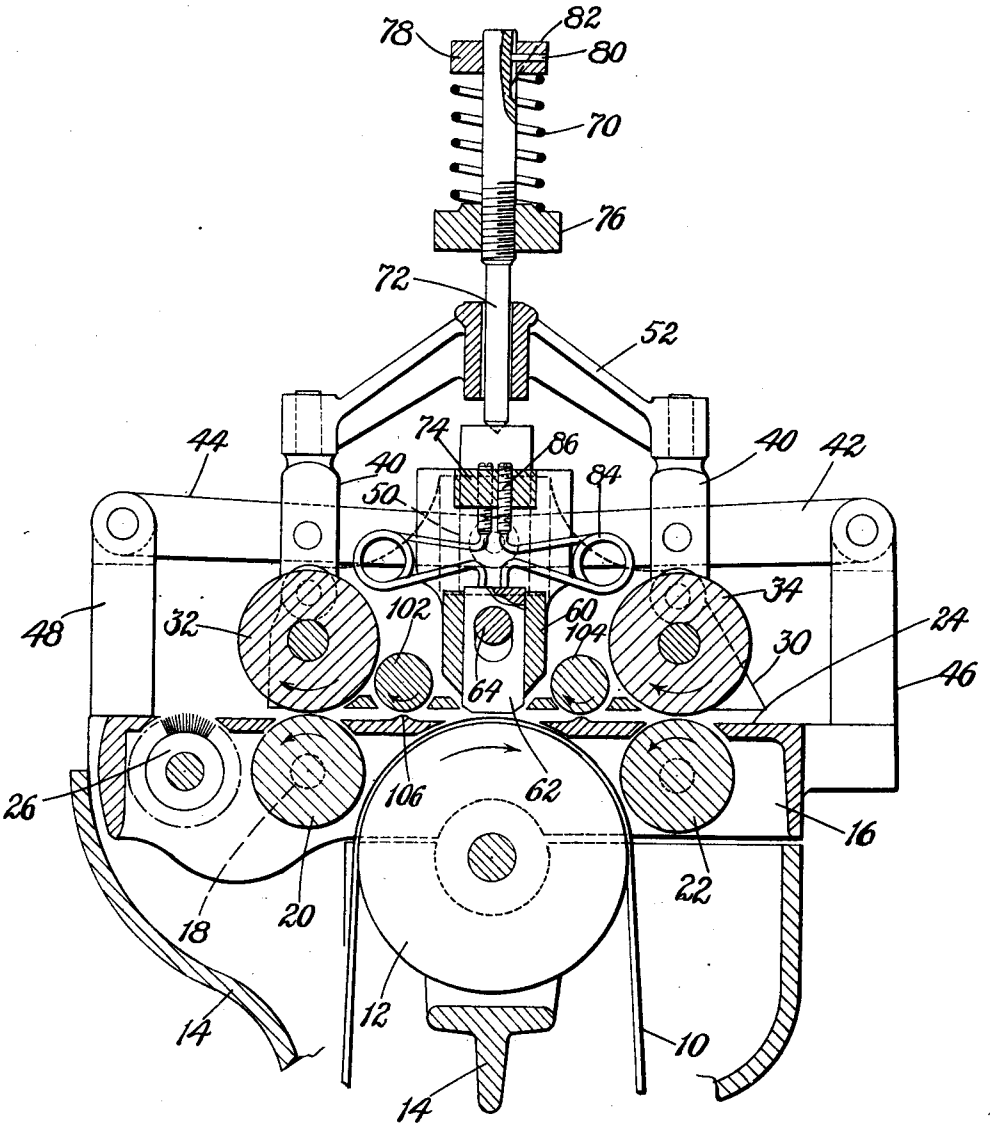


Fig. 2.

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Patented Apr. 30, 1929. 1,710,728

UNITED STATES PATENT OFFICE.

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FINISHING MACHINE.

Application filed July 20, 1925, Serial No. 44,795, and in Great Britain August 22, 1924.

This invention relates to finishing machines and is illustrated as embodied in a machine for buffing various blanks or parts for boots and shoes, such for example as soles, insoles, counters, toe boxes and the like.

While the buffing of soles and insoles which are of substantially uniform thickness may be carried out by various machines satisfactorily, such as that shown in United States Letters Patent No. 1,280,639, granted Oct. 8, 1918, on the application of Beier and Bock, such machines in general are not adapted for use on shoe parts of varying thickness such as counters, toe boxes and the like. These latter articles are of irregular shape and prior to their presentation to the buffing machine are beveled to reduce the periphery to a minimum thickness with the result that special mechanism is required for the proper presentation of their beveled surfaces to a buffing roll. The use of a movable feeding device provided with one or more matrices has been suggested but such an arrangement involves the disadvantage of requiring the placing of pieces of work in the matrices with some exactness so that the production of the machine is seriously reduced as compared with a machine in which there is a steady progression of pieces of the work. Such machines, also, do not utilize the abrasive material to as good advantage as those in which there is no necessity for presentation of the pieces to any one area of the feed rolls or the abrading device.

One object of the present invention, accordingly, is to provide an improved machine for buffing parts of boots and shoes which will be well adapted for treating articles of uniform thickness and by the use of which the treatment of articles having beveled surfaces or otherwise not uniform in thickness may be facilitated.

In accordance with a feature of the invention, there is provided a work-presenting mechanism comprising a presser arranged to urge the work against the treating tool, the presser being mounted for yielding movement as a unit when a sheet article of substantially uniform thickness is to be operated upon and made up of individually yieldable presser members which are movable relatively to one another in order that the various portions of a sheet article with skived margins or other similar variations in thickness may be pressed uniformly toward the treating tool at all portions of its width as it is fed through the machine.

In the illustrated embodiment of the invention the presser is interconnected with self-adjusting work-feeding devices and is arranged to yield as a unit following its preliminary adjustment by said devices so that articles of substantially uniform thickness have the same amount of material removed regardless of the thickness of the different pieces of work. On the other hand, when the machine is to be utilized for counters or other pieces of varying thickness, operator-controlled means are brought into play to affect the operation of the presser by preventing upward movement of the presser as a whole and disconnecting it from the self-adjusting feeding mechanism. As illustrated, the presser is made up of a plurality of presser members in the form of thin plates individually yieldable and movable with respect to one another with the result that all portions of an article of different thicknesses are properly presented for treatment by the abrading tool.

These and other objects of the invention will be more readily understood from consideration of the following description of the particular embodiment of the invention which is shown in the accompanying drawings, in which

Fig. 1 is a front elevation with parts broken away and in section;

Fig. 2 is a central vertical transverse section of the machine; and

Fig. 3 is a detail view of a latch.

The illustrated machine is of the type disclosed in the above-mentioned Letters Patent, to which reference may be had for a more complete description of those parts herein not fully shown or described, and embodies a centrally disposed power-operated abrading member 10 and power-driven lower feed rolls 20, 22 disposed ahead of and behind the abrading member, together with cooperating upper feed rolls 32, 34 mounted for up-and-down movement in unison, and a presser member for holding the work against the abrading tool.

The abrading tool 10 of the present machine comprises an endless belt passing over an upper pulley 12 mounted on the frame 14 of the machine and held taut by a lower adjustable pulley (not shown), power being supplied to drive one or the other of these

pulleys at a suitable speed. Most of the other operating mechanism, instead of being mounted directly in the frame of the machine, is carried upon a table 16 hinged about an axis 18 coinciding with the shaft of the rear lower feed roll 20. This roll 20 and the front lower feed roll 22 are positively driven for rotation in the direction indicated by the arrows in Fig. 2, and, together with the abrading tool 10, project through suitable openings in the flat upper surface 24 of the feed table 16. A rotary cleaning brush 26 may also be provided at the rear of the machine to remove the dust from the finished work.

A carrier 30 for upper feed rolls 32 and 34 is slidably mounted upon vertical rods 36 and 38 (Fig. 1) secured in the table 16, these upper feed rolls being idly mounted so that they co-operate with the lower feed rolls and, during the passage of the work through the machine, rotate in the direction indicated in Fig. 2. The upper feed roll carrier 30 is connected by means of uprights 40 pivoted thereon to intermediate points on links 42 and 44 which are duplicated upon the two sides of the machine and are carried at the upper end of posts 46 and 48 mounted upon the table 16. The inner ends of the links 42 and 44 are joined to one another and to a slidable block 50 guided in a vertical slot in the carrier 30 as indicated in Fig. 1. A spider 52 is also slidably mounted upon the vertical rods 36 and 38 and has arms engaging the upper ends of the uprights 40. Springs 54, surrounding the rods 36 and 38 bear against this spider and hold the upper feed roll carrier down to keep the upper feed rolls in engagement with the work. With this arrangement, when a piece of work is presented to the right-hand side of the machine as shown in Fig. 2, the forward upper feed roll 34 will be raised in accordance with the thickness of the work and the rear upper feed roll 32 will be raised an equal amount.

Co-operating with the two sets of feed rolls and interposed between them is a presser comprising a carrier 60 having arms at its upper side by means of which it is slidably mounted upon the rods 36 and 38 as shown in Fig. 1, said carrier 60 being recessed as shown in Fig. 2 for the reception of a plurality of individual presser members in the form of thin plates 62 shaped as shown in Fig. 2. Plates 62 are arranged side by side for sliding contact with one another, and thus they support one another against tilting. The end plates 62 are supported against tilting by sliding contact with the inner sides of the carrier 60. Each of these plates 62 is provided with an elongated aperture through which a rod 64 is passed which enters enlarged openings in the sides of the presser member carrier 60 and is adjustably supported therein by means of screws 66. Thus the lowermost level of the active face of the presser, when the plates are acting in unison, may be adjusted by these screws 66 to correspond to and be parallel with the upper surface of the abrading device. Stops 68 are provided, secured to the carrier 60 to limit the downward movement of said presser member carrier 60 by engagement with bosses upon the machine frame and its upward movement is controlled by means of a centrally disposed light spring 70 surrounding and urging down a pin 72 which passes loosely through an opening in the spider 52 and bears at its lower end against a crossbar 74 in the presser member carrier 60. The spring 70 is confined between an adjustable nut 76 upon the pin 72 and a header 78 carried upon the upper ends of the vertical rods 36 and 38. It will be noted that the upper end of the pin 72 is slidably mounted in the header 78 and that rotation of said pin is prevented by means of a pin 80 entering a slot 82.

Each individual presser plate 62 is urged toward its lowermost position by means of a coiled spring 84 (Fig. 2) bearing at one end against the presser plate and adjustably secured at its upper end by means of a screw 86 passing through the crossbar 74. The strength of each of the individual springs 84 is considerably greater than that of the spring 70 so that, when the machine is being used for insoles or other articles of uniform thickness, the presser will move as a unit and there will be no relative movement between the presser plates 62. The upper feed roll carrier will be raised as soon as the article enters the machine and lifts the feed roll 34 and is arranged in turn to raise the presser member carrier 60 a predetermined and slightly less amount against the tension of the spring 70, as will be explained later. As a result, a fixed amount will always be removed by the abrading roll, regardless of variations in the thicknesses of different pieces of work.

When, on the other hand, the machine is to be used for counters or the like of non-uniform thickness, operator-controlled means are brought into play to prevent upward movement of the presser member carrier 60, said means comprising a rotatable stop 90 mounted upon the header 78 in position for engagement with the upper end of the pin 72. With this condition, the spring 70 is rendered ineffective and the individual presser plates 62 are raised by the work against the action of the springs 84 in accordance with the varying thickness of the piece of work beneath the presser so that the beveled surfaces of the article are brought into proper engagement with the abrading tool and proper treatment is insured.

Thus the presser is made up of a plurality of individual presser plates 62 placed side by side in alinement and the arrangement is such that they can be caused to yield either as a unit

when work of uniform thickness is being passed through the machine or to yield individually in accordance with the varying thicknesses of different parts of a piece of work in order that the various surfaces thereof may be held against the abrading tool so as to be adequately and properly treated.

Automatic adjustment of the machine by the work itself, so that a predetermined amount is removed from the work by the abrading tool regardless of the thickness of the work, is effected as a result of the cooperation of the upper feed roll carrier 30 and the presser member carrier 60 which takes place through movable spacing arms 92 pivotally mounted upon pins 94 in the presser member carrier 60 and recessed at 96 for engagement with studs 98 in the upper feed roll carrier 30. Springs 100 surround the pins 94 to hold the spacing arms frictionally in the position in which they are placed, either vertically to make them effective or horizontally to make them ineffective. From an inspection of Fig. 3 it will be seen that there is a slight amount of play between studs 98 and the bottoms of the recesses 96. This play governs the amount of material to be removed when using the machine for articles of uniform thickness, such as insoles, because the presser is raised a slightly less amount than the upper feed roll carrier is when a piece of work is introduced. The difference in movement, and hence the amount of material removed, is, with a given adjustment of the machine, predetermined and may be exactly equal to the spacing or play and is, at any rate, independent of the thickness of the piece of work. When, on the other hand, the machine is to be used for articles such as counters these spacing arms are swung out of the path of the studs 98 so that the presser is then not raised by the feed rolls but is governed solely by the entrance of the piece of work between it and the abrading device, thus insuring proper action of the abrading device upon the beveled entering and leading ends of the piece of work as well as upon the beveled sides of the work.

To insure that, when short articles such as certain sizes of toe boxes, are to be buffed, the work will not be released by the front pair of feed rolls before it is engaged by the rear pair and therefore thrown out of the machine by the buffing roll, two auxiliary feed rolls 102 and 104 (Fig. 2) are provided located one at each side of and close to the presser member and between that member and the adjacent feed rolls. These auxiliary rolls are driven at the same peripheral speed as the main feed rolls and are mounted in the upper feed roll carrier 30. Ribs 106 are provided in the work table 16 immediately below the auxiliary feed rolls so that the piece of work is gripped between these ribs and the said rolls and undue frictional contact between the piece of work and the upper surface 24 of the work table is avoided.

Thus the illustrated machine is well adapted for use upon pieces of work having substantially uniform thickness, such as soles or insoles, and is equally well adapted for buffing pieces of work of varying thickness, such as counters or toe boxes with beveled edges and irregular shapes. When the machine is to be used for buffing insoles, it is put into the condition in which it is illustrated in Fig. 1 with the stop 90 turned aside and the spacing arms 92 in vertical position for engagement with the studs 98. In this condition the presser member carrier 60 will be raised as a whole by means of the connecting links 42 and 44 and the spacing arms 92 when a piece of work is inserted beneath the leading feed roll 34. The play, resulting from the recess 96 in Fig. 3, causes the presser member to be lifted a less amount than the feed roll is lifted so that a proportionate and predetermined amount will be removed from the work by the action of the abrading tool.

Such operation is not satisfactory for articles such as counters, however, not only because of the variations in thickness of the work transversely of the machine but also because of the variations in thickness of the work in the direction of movement of a piece of work as it progresses through the machine. Thus when the beveled forward end of a counter comes into position beneath the presser member, it may very well be that the full thickness of the counter will be beneath the feed roll 34, thus tending to lift the presser member, under the mode of operation described above, an amount such that the beveled forward end of the piece of work would not be held against the abrading tool at all. Consequently for this sort of work the stop 90 is turned into position to prevent upward movement of the rod 72, thus holding the presser member carrier 60 at a fixed distance from the abrading tool, and the spacing arms 92 are turned aside, where they are held by the springs 100, so that the front and rear upper feed rolls are free to move up and down in unison without affecting the presser member carrier. Under these circumstances the variations in thickness of the work are taken care of by the movements of the individual presser plates 62 under the action of their springs 84 with the result that all portions of the surface of the work are properly treated so that the edges are reduced to a feather edge and the central portion of the counter is slightly buffed without the removal of an undue quantity of material.

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 character described, a work-presenting mechanism embodying a plurality of presser members constructed and

arranged to yield independently in relation to one another to accommodate local variations in the thickness of the work and mounted as a unit to yield bodily to accommodate the maximum thickness of the work, and operator-controlled means for preventing such bodily movement and permitting only the independent movement of said pressed members.

2. In a machine of the character described, a work-presenting mechanism comprising a presser made up of a plurality of presser members individually yieldable with respect to one another, means which may permit the presser to yield as a whole when the work is of substantially uniform thickness throughout, and operator-controlled means constructed and arranged to affect the operation of the presser so that the individual units only will yield with respect to one another when different parts of a piece of work vary in thickness.

3. In a machine of the character described, a work-presenting mechanism comprising a presser embodying a plurality of relatively movable presser members, spring means arranged to allow the presser to yield as a unit, individual springs for said presser members each of which is stronger than said spring means, and means whereby said presser may be locked against yielding movement as a whole, to the end that relative individual yielding movement of the various presser members may result from the presentation of a piece of work in which different parts vary in thickness.

4. In a machine of the character described, a work table, a work-presenting mechanism having a plurality of presser members constructed and arranged to yield independently in relation to one another to accommodate local variations in the thickness of the work as they urge the work toward said table, said work-presenting mechanism being constructed and mounted as a unit to yield bodily to accommodate the maximum thickness of the work, and operator-controlled means for preventing such bodily movement and permitting only the independent movement of said presser members.

5. In a machine of the character described, an abrading tool, a feeding mechanism, a presser cooperating with said feeding mechanism to present the work to said abrading tool, said presser having a plurality of members constructed and mounted as a unit to yield bodily and to yield independently of one another only when said bodily movement is prevented, means actuated at the will of the operator by the work and responsive to the thickness of the work for lifting said presser bodily a distance less than said thickness by a predetermined amount so as to cause said abrading tool to reduce such thickness by a correspondingly predetermined amount, and operator-controlled means for preventing said bodily movement and to permit only the independent movement of said members when it is desired to reduce the thickness of the work in relation to the local variations in the thickness thereof

6. In a machine of the character described, an abrading tool, feed rolls resiliently held against the work, a presser comprising a spring-pressed carrier and relatively movable self-adjusting elements in said carrier, movable arms between the carrier and the feed rolls arranged when in connecting position to adjust the position of the carrier with regard to the thickness of a piece of work being fed by the feed rolls, and means which may be positioned to hold the carrier rigidly in position when the arms between the carrier and the feed rolls have been moved out of connecting position.

7. In a machine of the character described, an operating instrumentality, feeding means disposed adjacent to said operating instrumentality, a presser comprising relatively movable members, individual springs urging the presser members toward the operating instrumentality whereby said members are constructed and arranged to hold a piece of work uniformly against the operating instrumentality, said presser being slidably mounted as a unit for limited movement toward and away from the operating instrumentality and means arranged in one position to hold said presser against sliding movement and in another position to permit a free sliding movement.

8. In a machine of the character described, a treating tool, a presser member carrier disposed adjacent to said tool, means for resiliently urging said carrier toward the treating tool, presser members movably mounted in said carrier, springs for urging said presser members toward the tool, said springs being stronger than said resilient means, and operator controlled means blocking the yield permitted by said urging means for holding the carrier at a fixed distance from the treating tool.

9. In a machine of the character described, a work table provided with an opening, a treating tool below said table projecting through said opening, a feed roll carrier, a presser member carrier, common means on said table for slidably supporting said carriers, means for resiliently urging each of said carriers toward the table, and means for interchangeably engaging or disengaging said carriers adjacent to said common supporting means.

10. In a machine of the character described, an abrading tool, self-adjusting feed rolls, a carrier for a presser member, and displaceable connections between said feed rolls and said carrier provided with a predetermined amount of play and constructed and

arranged so that the feed rolls lift the carrier away from the abrading tool to cause the machine to remove from the work a portion of material determined in part by the amount of play in said displaceable connections or, when displaced, allow the presser member to act independently of the feed rolls.

11. In a machine of the character described, an abrading tool, a work table, a feed roll co-operating with said work table to deliver a piece of work to the abrading tool, and a fixed rib upon said work table adjacent to said abrading tool and beneath said feed roll and constructed and arranged to co-operate with the feed roll to secure a grip upon the work while preventing excessive friction between the work and the work table.

In testimony whereof I have signed my name to this specification.

JOSEPH GOULDBOURN.