Sept. 15, 1942. E. W. STACEY 2,295,695

ABRADING MACHINE

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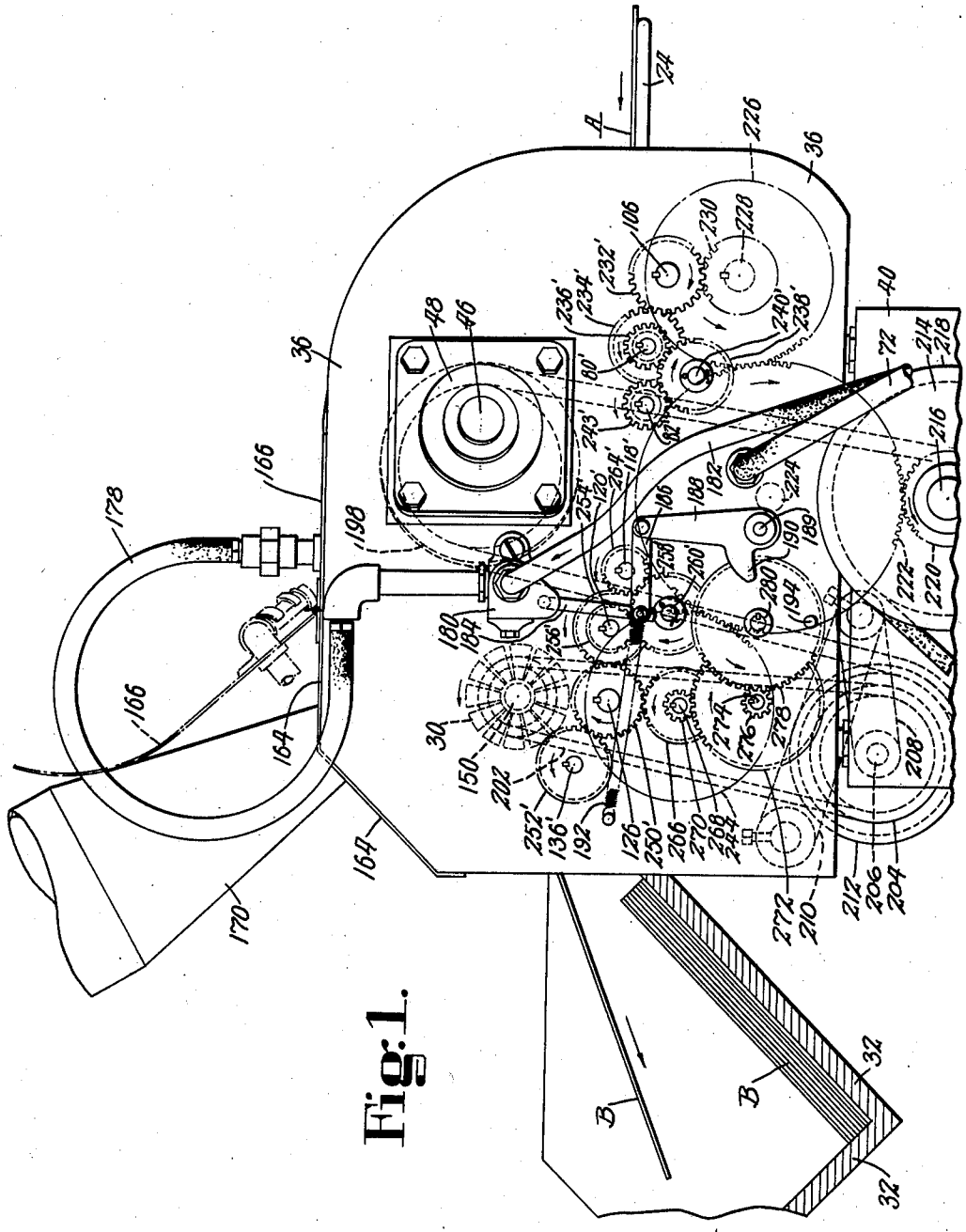


Fig. 1.

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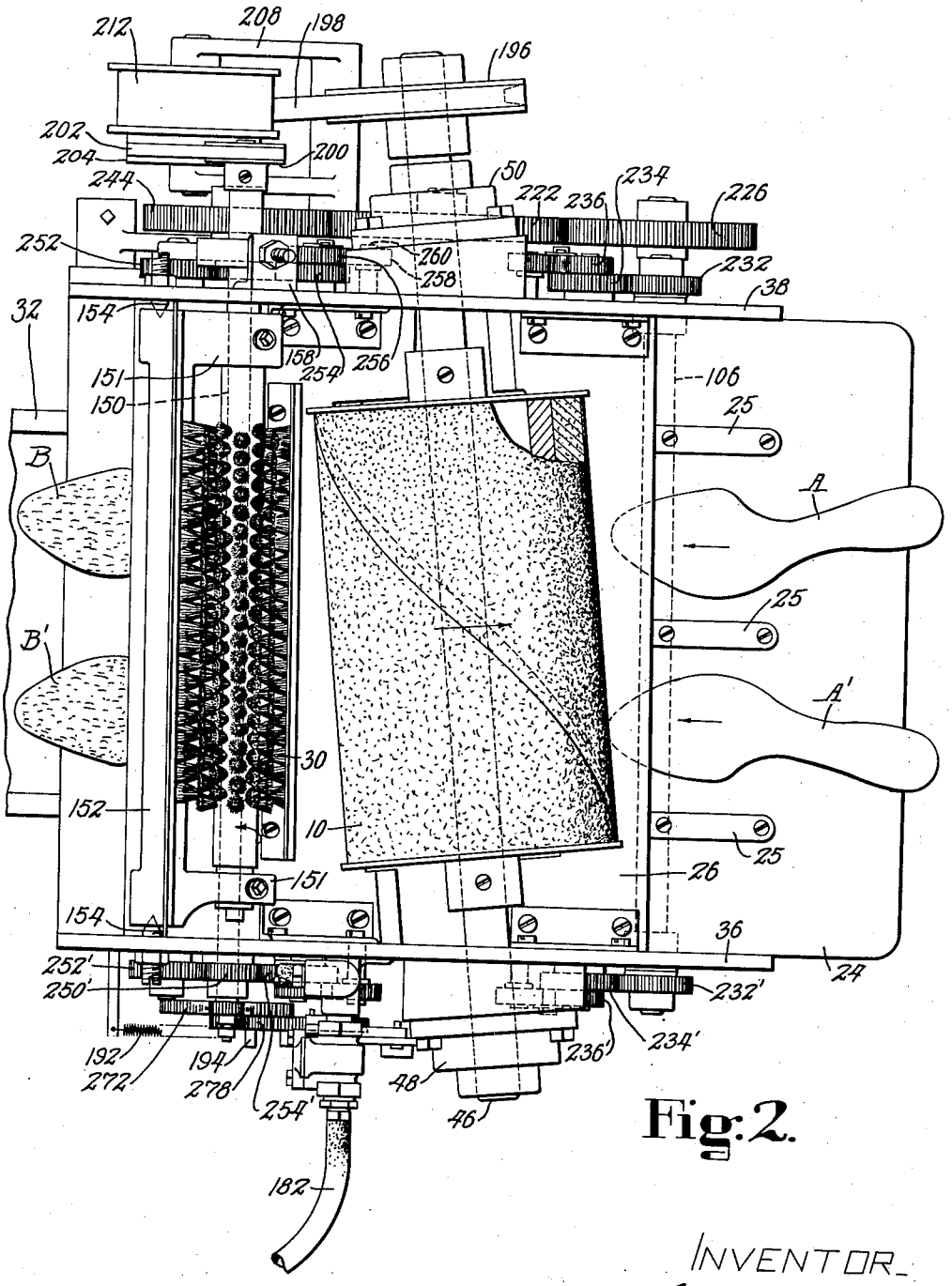


Fig:2.

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Fig. 4.

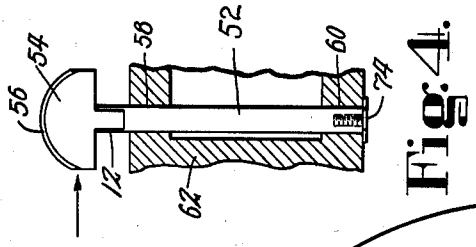


Fig. 5.

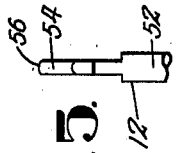


Fig. 3.

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ABRADING MACHINE

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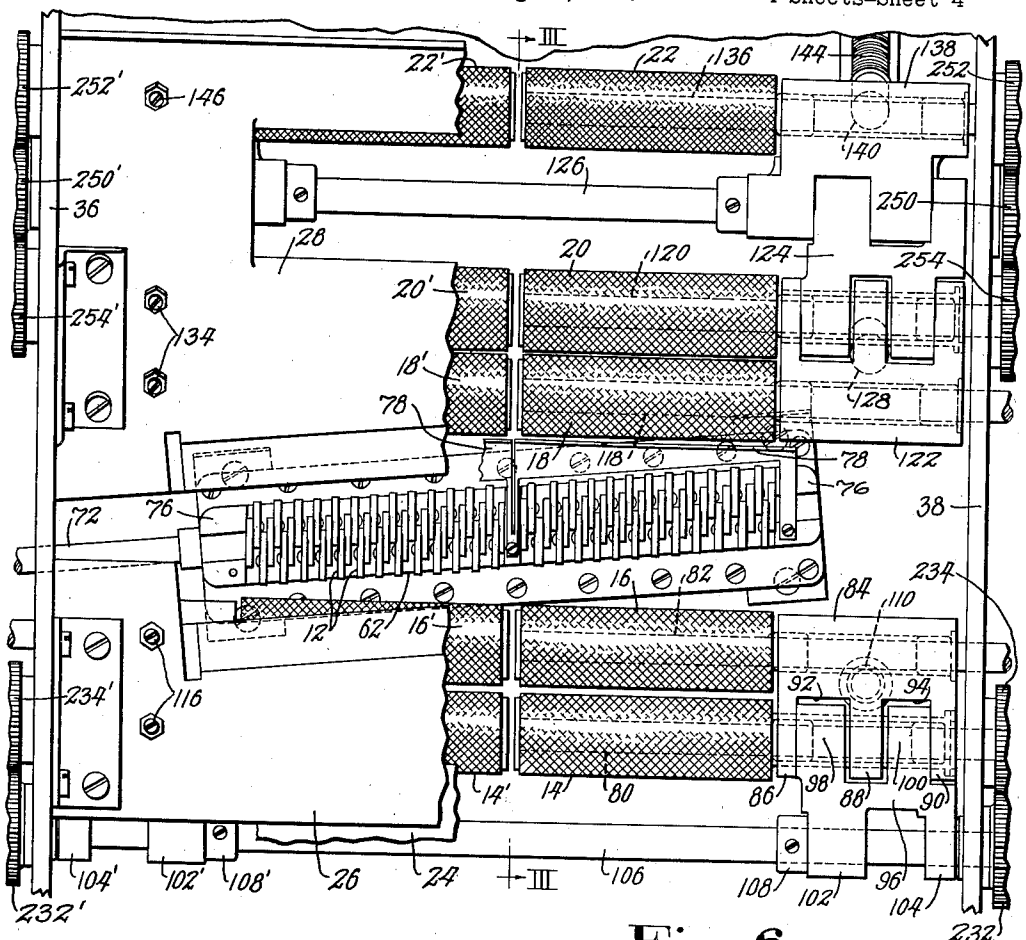


Fig. 6.

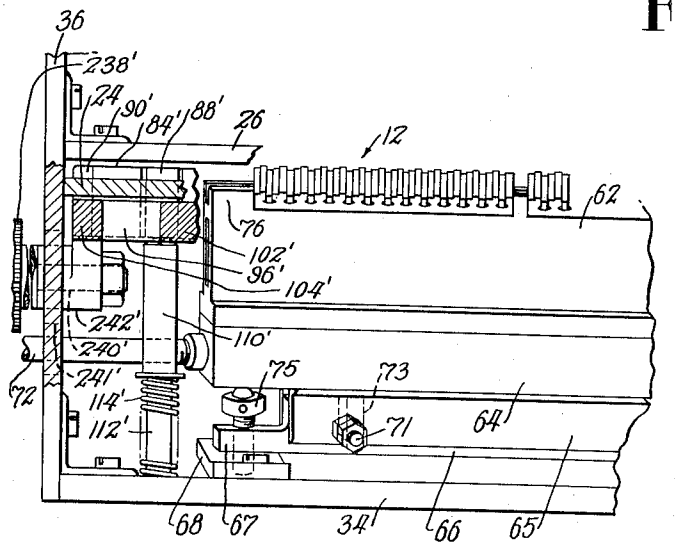


Fig. 7.

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UNITED STATES PATENT OFFICE

2,295,695

ABRADING MACHINE

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Application August 1, 1940, Serial No. 349,161

7 Claims. (Cl. 51—78)

This invention relates to abrading machines and is herein illustrated and described as embodied in a buffing machine of the type disclosed in United States Letters Patent No. 2,218,537, granted October 22, 1940, upon the application of Norwood H. Knowlton. Such machines are conveniently used for operation upon shoe parts, such as outsoles which are to be buffed on their grain surfaces prior to their attachment to shoes. Machines of the type under consideration include in their organization a buffing tool, means for feeding a work-piece past the buffing tool, and a device for holding the work-piece in engagement with the buffing tool during its progress past the tool.

It is an object of the present invention to provide a buffing machine having improved means for holding a workpiece in engagement with a buffing tool. In the illustrated machine the work is held against the buffing tool by a pressing means which comprises a plurality of plungers arranged in staggered rows lengthwise of a buffing roll and actuated by pneumatic pressure. Each of these plungers is slidably mounted in a wall of a fluid pressure chamber, the outer end portion of the plunger having the shape of a relatively narrow, blunt edged blade for slidably engaging the moving work-piece. Such a pressing device is of particular convenience in a machine of the type disclosed herein, wherein the axis of the buffing roll is in skewed relation to the direction of feed of the work to provide an axial component of relative movement between the abrasive surface of the buffing roll and the work-piece. The effect of such axial component is to minimize any tendency of the grit of the buffing roll to cause visible scratch marks upon the surface of the work.

Other objects of the invention are to provide an improved arrangement for feeding a work-piece past the buffing roll, and an improved mechanism for blowing jets of air against the buffing roll to remove dust resulting from the operation of the roll upon the work.

These and other objects and features of the invention will appear more fully from the following detailed description when read in connection with the accompanying drawings and will be pointed out in the appended claims.

Referring now to the accompanying drawings:

Fig. 1 is an end elevation of the machine;

Fig. 2 is a plan view of the machine with the dust hood removed;

Fig. 3 is a sectional view in end elevation taken on the line III—III of Fig. 6;

Fig. 4 is a detail showing one of the work-pressing fingers;

Fig. 5 is a view of the outer portion of the finger shown in Fig. 4 looking in the direction of the arrow;

Fig. 6 is a plan view of the work-supporting and feeding arrangements with the dust hood and buffing roll removed; and

Fig. 7 is a fragmentary showing in front elevation of the parts shown in Fig. 6.

The machine in its general organization comprises a buffing roll **10** (Figs. 2 and 3) against which work-pieces such as a pair of soles A and A' are yieldably held by a plurality of presser fingers **12**. The buffing roll **10** is long enough to enable the soles A and A' to be presented simultaneously in side-by-side relation, the sole A being fed by a plurality of right hand feed rolls **14**, **16**, **18**, **20** and **22**, and the sole A' being fed by a corresponding plurality of left hand feed rolls **14'**, **16'**, **18'**, **20'** and **22'** (Fig. 6). The feed rolls are arranged in pairs **14** and **14'**, **16** and **16'**, etc. with the two rolls of each pair in end-to-end relation, that is, approximately coaxial with each other, but mounted independently of each other to enable each roll to yield in accordance with the thickness of the particular sole which it engages. These rolls are all deeply knurled to insure a good frictional grip upon the work. The work is introduced by the operator upon a substantially horizontal work table **24** having a smooth upper surface leading to the first feed roll **14** and provided with guide strips **25**. The leading end of the sole A, upon being engaged by the feed roll **14** is advanced to the second feed roll **16**, the two rolls **14** and **16** meanwhile pressing the work-piece upwardly against a smooth under surface formed on a feed plate **26**. The leading end of the sole A thereupon enters between the presser fingers **12** and the buffing roll **10**, and thence passes over the feed rolls **18** and **20** which press it against the smooth under surface of a feed plate **28**. As shown in Fig. 3, the feed plate **28** is inclined upwardly to curve the work-pieces about the buffing roll and thereby prolong their engagement with the abrasive. The sole A thereupon passes a rotary brush **30** which cleans dust from the upper surface of the sole, the brush extending downwardly through a slot in the feed plate **28**. After passing the brush **30**, the sole A is engaged between the feed roll **22** and the feed plate **28**. Except for the fact that the sole A' is engaged by a different set of feed rolls, its passage through the machine is similar to that of the sole A. A

receptacle 32 is provided for receiving the finished work-pieces, such as soles B and B', as they fall from the last feed rolls 22 and 22'.

All of the above-mentioned instrumentalities are mounted in a head comprising a base-plate 34 and a pair of parallel end walls 36 and 38. This head is supported upon the upper portion of a column or frame 40 of any desired construction. The buffing roll 10 may be of any well-known type having a peripheral cushion of resilient material 42 and an abrasive cover 44 of sand paper or other abrasive sheet material. The roll 10 is mounted upon a shaft 46, which is journaled in bearings 48 and 50 carried by the end walls 36 and 38 respectively. As shown in Fig. 2, the axis of the shaft is not parallel to the transverse center line of the machine, but is somewhat oblique, while the path of feed of the work-pieces, as later will be pointed out, is parallel to the longitudinal center line of the machine. It is thus evident that the axis of the buffing roll is in skewed relation to the direction of feed of the work-pieces. The rotation of the roll, by reason of this skewed relation, will cause an endwise or axial component of movement to be developed between the abrading surface of the roll and the work-piece. An advantage of this endwise component resides in the fact that any more prominent particles of grit upon the sand paper 44 which might cause visible scratch marks upon the work if allowed to retrace their former paths upon the work will, upon succeeding engagement, be laterally displaced from such paths and therefore will not gouge more deeply into the work and extend lines already formed. The visibility of such marks when thus distributed is negligible.

Each of the presser fingers 12 consists of a cylindrical shank 52 (Figs. 4 and 5) terminating at its upper end in a thin blade-like head 54. The head 54 is relatively long and narrow, its length being considerably greater than the diameter of the shank 52 and its width being considerably less. The head 54 is transversely rounded to provide a blunt edge 56 and is also longitudinally rounded to facilitate the entry of work-pieces between it and the buffing roll and to minimize friction against the work-pieces. Each of the shanks 52 operates as a plunger and is individually guided in a pair of coaxial bores 58 and 60 formed in a hollow box-like member 62, which extends substantially the length of the buffing roll 10 and which forms the upper closure wall of an air pressure receptacle or chamber 64, the box 62 being secured to the receptacle 64 by screws 61. The bores 58 and 60 are arranged in three parallel rows, each set of bores being staggered with respect to the neighboring bores of the other rows to enable the fingers to operate over an arc of contact about the axis of the buffing roll and also to provide for a close spacing of the heads 54. Secured to the bottom of the receptacle 64 are a pair of angle irons (Figs. 3 and 7) having spaced depending flanges 65 which embrace a block 66. Each end of the block 66 has a lug 67 which is secured to the upper surface of a supporting plate 68. Each of the plates 68 is secured to the base-plate 34 by screws 69, the rear screws 69 passing through wedge-blocks 70 to incline the plate 68 upwardly. The plates 68 are thus secured in such a position as to bring the three rows of bores all parallel to the axis of the buffing roll 10 and with the center row in a plane which is substantially radial with respect to the buffing roll. The fingers 12 engage the work-pieces slightly beyond the vertical center line of the buffing roll in view of the fact that the work-pieces are curved upwardly around the buffing roll to prolong their engagement therewith. The shanks 52 accordingly tilt backwardly, and the purpose of the inclination of the plates 68 is to provide this tilt. The flanges 65 are secured to the block 66 by clamping bolts 71 which extend through heightwise slots 73 formed in the block to accommodate adjustment of the receptacle 64 toward and from the buffing roll. Such adjustment is determined by screws (Fig. 7) threaded into the lugs 67 and having knurled heads 75. These screws also have rounded upper end portions above the heads 75 for engagement with the under surface of the receptacle 64.

Air under pressure is supplied to the receptacle 64 through a conduit 72 from any convenient source. The air pressure may be controlled by a reducing valve (not shown) of any well-known type. The fingers 12 are held against expulsion by the air pressure by means of screws 74 threaded axially into the inner ends of the shanks 52 and having heads of greater diameter than the bores 60. The fingers thus normally occupy their outermost positions, as shown in Figs. 3 and 4, but may yield inwardly to accommodate the thickness of a work-piece passing between them and the buffing roll. The normal positions of the fingers toward or from the buffing roll is determined by the adjustment of the screws 75. This adjustment should provide just sufficient clearance to prevent contact between the fingers and the buffing roll, and it does not have to be varied for work-pieces of greater or less thickness because the pressure exerted by the air is independent of the thickness of the work. It is evident that each finger may yield independently of the others to accommodate local variations of thickness, such as may occur in a skived work-piece. The blade-like heads 54 are arranged parallel to each other, their thickness being sufficient to keep each head substantially in sliding engagement with its neighbor. The heads of the end fingers are maintained substantially parallel to the longitudinal center line of the machine, which is also in the direction of feed, by smooth surfaces formed on upward extensions 76 of the box 62. The engagement of each head with its neighbor maintains all of the intermediate heads in similar alinement.

A supplemental presser 78 (Fig. 3) in the form of a resilient metal plate secured to the top of the box 62 holds the work against the buffing roll at a locality between the fingers 12 and the first of the rear feed rolls 18 and 18'.

The feed rolls 14 and 16 are carried upon short shafts 80 and 82 (Fig. 6) respectively, which are both journaled in a block 84. The block 84 is cut away to provide three bearings 86, 88 and 90 for the shaft 80, these bearings being separated by spaces 92 and 94. A block 96 has two portions 98 and 100 which extend into the spaces 92 and 94 respectively and which also constitute bearings for the shaft 80 at said spaces. The two blocks 84 and 96 thus constitute a hinge, of which the shaft 80 is the pintle. The block 96 has two spaced extensions 102 and 104 which are mounted for free pivotal swinging movement upon a transverse shaft 106 extending the full width of the machine and journaled in bearings carried by the end walls 36 and 38. The

block 96 is held against endwise movement, or lateral movement with respect to the machine, by engagement with the end wall 38 at one end and with a collar 108 secured upon the shaft 106 at the other end. The block 84 is urged upwardly toward the feed plate 26 by a plunger 110 (see also Fig. 3) which engages the under surface of the block and which is slidably mounted upon a post 112 secured in the base-plate 34. The upper end of the plunger 110 is rounded to facilitate rocking of the block 84. Surrounding the lower portion of the post 112 and interposed between the base 34 and a flange on the plunger 110 is a coil compression spring 114, which urges the plunger and thereby the block 84 upwardly to a stop position adjustably determined by a pair of stop screws 116 threaded through the feed plate 26.

The feed rolls 18 and 20 are mounted upon short shafts 118 and 120 respectively, these shafts being journaled in a block 122, which, in turn, is hinged to a block 124. The shaft 120 serves as the pintle of the hinge, the arrangement being similar to that of the blocks 84 and 98. The block 124 is pivotally mounted upon a shaft 126, which extends transversely the full width of the machine and is journaled in bearings mounted in the respective end walls 36 and 38. The block 122 is urged upwardly toward the feed plate 28 by a plunger 128 slidably mounted upon a post 130 and urged upwardly by a compression spring 132. The plunger 128 has a rounded upper end upon which the block 122 can rock or tilt. Upward movement of the block 122 is adjustably limited by a pair of stop screws 134 threaded through the feed plate 28.

The feed roll 22 is mounted upon a short shaft 136, which is journaled in a block 138 pivotally mounted for free swinging movement upon the shaft 126. The block 138 is urged upwardly toward the feed plate 28 by a plunger 140 slidably mounted upon a post 142 and urged upwardly by a coil compression spring 144 to a stop position adjustably determined by a stop screw 146 threaded through the feed plate 28 and engageable with the upper surface of the block. The posts 130 and 142 are secured in a stationary bracket 148 which is bolted to the base-plate 34, the posts being inclined from the vertical at such an angle as to bring them into perpendicular relation to the feed plate 28.

The provisions for mounting the left hand feed rolls 14', 16', 18', 20' and 22' are similar to the provisions for mounting the right hand feed rolls 14, 16, 18, 20 and 22 except for a right to left reversal to bring the left hand members into symmetrical relation to the right hand members. Further description of these left hand members may therefore be omitted, and wherever the left hand members are referred to individually or shown in the drawings, they will be identified by the same reference numerals as their right hand counterparts, the left hand members however being distinguished from the right hand members by the use of primed numerals.

The shafts 106 and 126 and all the feed rolls are parallel to the transverse center line of the machine. The feed of the work-pieces therefore takes place in the direction of the longitudinal center line of the machine, while the direction of movement of the abrading surface of the roll 10 is oblique to the direction of feed of the work-pieces for a purpose which has already been mentioned.

The brush 30 is mounted upon a shaft 150 journaled in bearings formed in lugs 151 extending from the respective ends of a transverse bracket 152 which is pivotally supported for free swinging movement by two coaxial pivot pins 154 secured in the respective end walls 36 and 38. The bracket 152 is urged downwardly by a coil compression spring 156 interposed between the bracket and a flange 158 extending from the adjacent end wall 38. The spring 156 surrounds a post 160 secured in the bracket 152 and extending loosely through an opening in the flange 158. A nut 162 threaded upon the upper portion of the post 160 adjustably limits the downward movement of the bracket 152 under the influence of the spring 156.

For disposing of the dust which arises from the operation of the buffing roll upon the work, the upper portion of the machine is housed in a dust hood having a stationary portion 164 extending between and supported by the respective end walls 36 and 38. A forward extension 166 of the hood is pivotally mounted upon the stationary portion by a hinge 168 to enable it to be raised for the purpose of providing access to the buffing roll. The hood 164 communicates with a suction outlet 170 adapted for connection to an exhaust fan or to the usual suction system provided in factories where buffing operations are performed. An opening 172 between the rear portion of the hood 164 and the receptacle 32 is left to provide for the exit of finished work-pieces. A baffle 173 supported upon the bracket 152 directs the dust laden air to the outlet 170. A curved guard 175 of sheet metal shields the brush 30 from dust thrown off the buffing roll.

Supported by the hinged portion 166 of the dust hood and extending parallel to the buffing roll 10 is a pipe 174 having a longitudinal slit 176 directed toward the periphery of the buffing roll at such an inclination as to cause jets of air issuing therefrom to oppose the peripheral air current set up by the rotation of the roll. The pipe 174 is connected by a flexible conduit 178 (Fig. 1) to a valve chamber 180, which is supplied by a pipe 182 with air under pressure from any suitable source of supply. A valve in the chamber 180 is operated through a lever 184 to provide for intermittent blasts of air. To this end the lever 184 is connected through a link 186 to a rocker arm 188 fulcrumed upon a stationary pin 189 and having an extension 190. The valve is normally held closed by a tension spring 192 anchored at one end to the end plate 36 and connected at its other end to the lever 184. The valve is opened periodically by a pin 194 which is brought into engagement with the extension 190 by mechanism later to be described.

The driving arrangements will now be described. Secured upon the buffing roll shaft 46 is a pulley 196 (Fig. 2) which is driven through a belt 198 from any convenient source of power. Secured upon the brush shaft 150 is a pulley 200 driven by a belt 202, which, in turn, is driven from a pulley 204 (Fig. 1) secured upon a stub shaft 206. A bracket 208, which is pivotally mounted for adjustment upon a stationary bracket 210 secured to the end wall 38, carries a bearing in which the shaft 206 is journaled. Secured to the pulley 204 and rotatable therewith is a pulley 212, which is engaged by the belt 198 to transmit drive through the belt 202 to the brush 30.

For driving the feed rolls, there is provided a pulley 214 (Fig. 1) secured upon a transverse shaft 216 journaled in bearings mounted in the

frame 40. The pulley 214 is driven through a belt 218 from any convenient source of power. Secured upon the shaft 216 is a pinion 220, which engages a gear 222 carried by a stub shaft 224 mounted in the end wall 38. The gear 222 drives a gear 226 secured upon a stub shaft 228 carried by the right hand end wall 36. Mounted upon the shaft 228 in fixed relation to the gear 226 is a pinion 230 which drives a gear 232 (Fig. 2) keyed upon the right hand end of the shaft 106.

It will be convenient, because of the fact that the gearing is best shown in Fig. 1, to consider first the drive of the feed rolls adjacent to the left hand end wall 36, that is, the feed rolls indicated by primed reference numerals. The gears associated with these feed rolls will be indicated also by primed reference numerals, while the gears associated with the right hand feed rolls, being directly in back of and therefore obscured by the left hand feed roll gearing from the viewpoint of Fig. 1, will, when shown in other figures, be indicated by corresponding unprimed numerals.

Keyed upon the left hand end of the shaft 106 (Figs. 1 and 2) is a gear 232' in driving engagement with a gear 234' keyed upon the shaft 80'. A pinion 236' coaxial with and fixed to the gear 234' drives an idler gear 238' mounted on a stub shaft 240' which is mounted in a lug 242' (Fig. 7). This lug 242' is the left hand counterpart of a lug 242 (Fig. 3) extending downwardly from the block 84. The idler gear 238' drives a gear 243' mounted on the shaft 82'. The shafts 80', 82' and 240' pass through holes in the end wall 36 large enough to provide ample clearance for the movements of the shafts in yielding to accommodate the thickness of a work-piece. The hole for the shaft 240' is indicated by the reference numeral 241' in Fig. 7; its right hand counterpart 241 is shown in Fig. 3. It is evident that the gears 236', 238' and 243' will always be in mesh with each other notwithstanding these movements, for the reason that their respective shafts are all mounted in parallel relation in the same block 84'. Furthermore, the gear 234' is always held in mesh with the gear 232' by the block 96' operating as a link. The train of gears from the shaft 106 to the shaft 82' will, therefore, always be in mesh notwithstanding the floating movements of the feed rolls.

For driving the feed rolls 18', 20' and 22' there is provided a gear 244 (Figs. 1 and 2) carried by a stub shaft (not shown) mounted in the right hand end wall 38 and driven by the gear 222. Coaxial with the gear 244 and in fixed relation thereto is a pinion (not shown) which drives a gear 250 (Fig. 6) secured upon the shaft 126. Secured upon the left hand end of the shaft 126 is a gear 250' which drives a gear 252' secured upon the end of the left hand feed roll shaft 136'. The block 138' operates as a link to hold the gear 252' in mesh. The gear 250' also drives a gear 254' secured upon the end of the left hand feed roll shaft 120'. The block 124' operates as a link to hold the gear 254' in mesh. Also keyed upon the shaft 120' is a pinion 256' which drives an idler gear 258' mounted on a stub shaft 260' carried by a lug (not shown; see Fig. 3 for right hand counterpart 262) extending from the block 122'. The idler gear 258' drives a gear 264' secured upon the end of the feed wheel shaft 118'. It is evident that, by reason of the above-described arrangement of gears, drive may be transmitted to the feed rolls 18', 20' and 22' regardless of the floating movements of the feed rolls. The shafts 136', 120', 118' and 260' pass through holes in the adjacent end wall large enough to provide ample clearance for the floating movements of these shafts. The hole for the right hand counterpart of the shaft 260' is indicated by the reference numeral 261 in Fig. 3.

Although the gears for driving the right hand feed rolls are invisible in Fig. 1, such gears are directly in back of their left hand counterparts as shown in that figure. The preceding description therefore serves also to indicate the arrangement of the right hand feed roll gears; when thus read however the primes should be dropped from the reference numerals to avoid confusion.

It has already been pointed out that the shaft 106 serves not only as a pivot for the blocks 96 and 96' but it operates also to transmit drive from the gear 232 to the gear 232'. If desired a pair of coaxial shafts, with ample clearance between them, may be employed in place of the single shaft 106 to perform these separate functions, the outer shaft of such pair being stationary to serve as the pivot and the inner shaft being rotary to transmit drive. A similar substitution may be made for the shaft 126.

For operating the valve 180, there is provided an idler gear 266 (prime numbers need no longer be employed for the members now to be described because these members, even though some of them may obscure similar members at the opposite end of the machine, have no functional counterparts) driven by the gear 259' and carried by a stub shaft 268 mounted in the end wall 36. A pinion 270 coaxial with and secured to the gear 266 drives a gear 272 carried by a stub shaft 274 mounted in the end wall 36. A pinion 276 coaxial with and secured to the gear 272 drives a gear 278 carried by a stub shaft 280 mounted in the end wall 36. The pin 194 which operates the valve 180 extends from the face of the gear 278 which is driven at relatively slow speed by the train of gearing already described.

The operation of the machine will be readily understood in view of the foregoing description. The soles A and A' are introduced upon the work table 24 by hand. The first set of feed rolls thereupon grip the work-pieces frictionally and press them against the feed plates to cause the work-pieces to advance into operative engagement with the buffing roll. During such engagement the plungers 12 hold the work-pieces against the buffing roll with substantially uniform pressure notwithstanding local variations of thickness in the work-pieces. The blade-like heads 54 of the plungers extend in the direction of feed and help to hold the work against any tendency to move laterally as a result of the skewed relation of the buffing roll. While a work-piece is engaged by both feed rolls of the first set, that is, the rolls 14 and 16, or 14' and 16', it is firmly held by these rolls against lateral diversion by the buffing roll. By the time the trailing end of the work-piece has passed the roll 14 and 14', the leading end will have come into engagement with the roll 18 or 18'; and by the time the trailing end has passed the roll 16 or 16', the leading end will have come into engagement with the roll 20 or 20'. It is clear therefore that the work-piece during its entire passage past the buffing roll is under the control of at least two feed rolls, and such control maintains the direction of feed parallel to the longitudinal center line of the machine. After passing the buffing roll the work is fed past the brush and is then deliverd into the receptacle 32.

It will be noted that the positively driven feed rolls not only carry the work to and past the buffing roll but also hold the work against any tendency of the buffing roll, which rotates in a counterclockwise direction as seen in Fig. 3, to speed up the feed. By reason of the arrangements for mounting the feed rolls, each feed roll of the right or left hand group yields independently of the other rolls of that group, and also of its counterpart in the other group.

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

1. An abrading machine comprising an abrading roll, means for feeding a work-piece past said abrading roll, the axis of the roll being in skewed relation to the direction in which the work-piece is fed by the feeding means to provide an axial component of relative movement between the abrasive surface of the roll and the work-piece, a plurality of rows of individually yieldable presser fingers extending parallel to the axis of the roll, the fingers of one row being staggered with relation to the fingers of another row, and pneumatic means acting upon said fingers to cause the fingers to press the work-piece against the roll.

2. A device for pressing a work-piece against a tool comprising a receptacle for holding a pressure fluid, and a plurality of plungers, said receptacle having a wall provided with a plurality of rows of openings in which said plungers are mounted in staggered relation with the inner ends of the plungers subject to the pressure within the receptacle, the outer ends of the plungers being in the form of relatively narrow blunt-edged blades each overlapping its staggered neighboring blades, the purpose of said blades being to press the moving work-piece against the abrading tool.

3. In a machine of the class described, a pair of rolls adapted for frictional engagement with a work-piece, a shaft for each of said rolls, a support in which said shafts are mounted in parallel relation, a member pivotally connected to one of said shafts, and a pivotal mounting which enables said member to be swung about an axis parallel to said shafts, said support being pivotable about the roll shaft to which said member is pivotally connected, whereby each of said rolls may move bodily independently of the other while engaging a work-piece without disturbing their parallel relation to each other and to said axis.

4. In a machine of the class described, a pair of feed rolls, shafts for said feed rolls, a support in which said shafts are journaled in parallel relation, a gear on each of said shafts, an idler gear in mesh with each of said gears and carried by said support, a third shaft, a link having a bearing on one of said feed roll shafts and having another bearing on said third shaft, said link being free to swing about said third shaft to accommodate tilting movement of said feed roll support while maintaining said feed rolls parallel to each other and to said third roll, a gear on said third shaft for driving the gear on the feed roll shaft on which said link has a bearing, and means for driving said driving gear.

5. In a machine of the class described, a pair of feed rolls, a shaft for each of said rolls, a block in which the shafts are journaled in parallel relation, a third shaft parallel to said feed roll shafts, a link having a bearing on said third shaft and also on one of said feed roll shafts to maintain the feed roll shafts in said parallel relation to said third shaft while leaving said block free to rotate about the third shaft and to tilt about said one feed roll shaft, a spring-pressed plunger acting against said block to cause the feed rolls to press against one surface of a work-piece, and means engageable with the opposite surface of the work-piece to hold the work-piece against the pressure exerted by said plunger.

6. An abrading machine comprising an abrading tool, means for effecting relative movement between said tool and a work-piece, a nozzle for directing a jet of air against said abrading tool to blow dust therefrom, a connection from said nozzle to a source of air under pressure, and control means operated by said movement-effecting means for alternately stopping and releasing the flow of air from said nozzle, thereby causing the air to be delivered from said nozzle periodically.

7. An abrading machine comprising a rotary abrading tool, means for driving said tool, a nozzle for directing a jet of air against said tool to blow dust therefrom, a connection from said nozzle to a source of air under pressure, a valve in said connection for controlling the flow of air from said nozzle, and means operated by said driving means for opening and closing said valve periodically.

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