Oct. 24, 1950 A. N. EMMONS 2,527,003

GRINDING MACHINE

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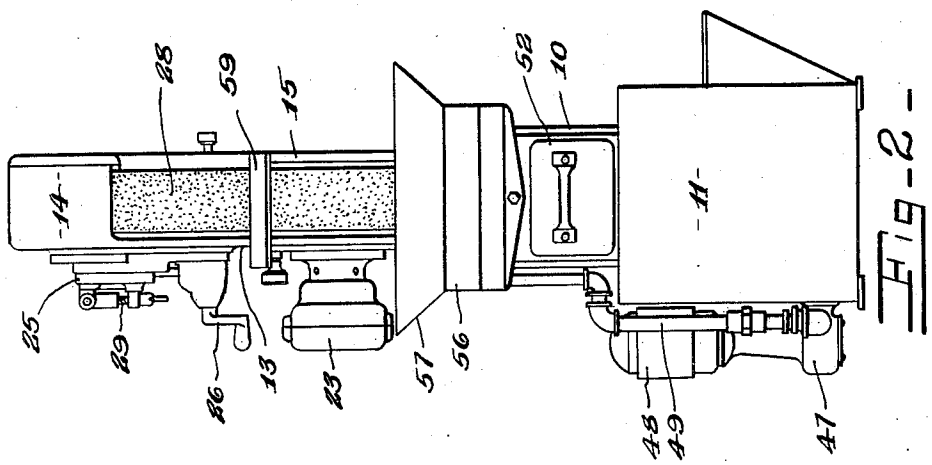


Fig-2-

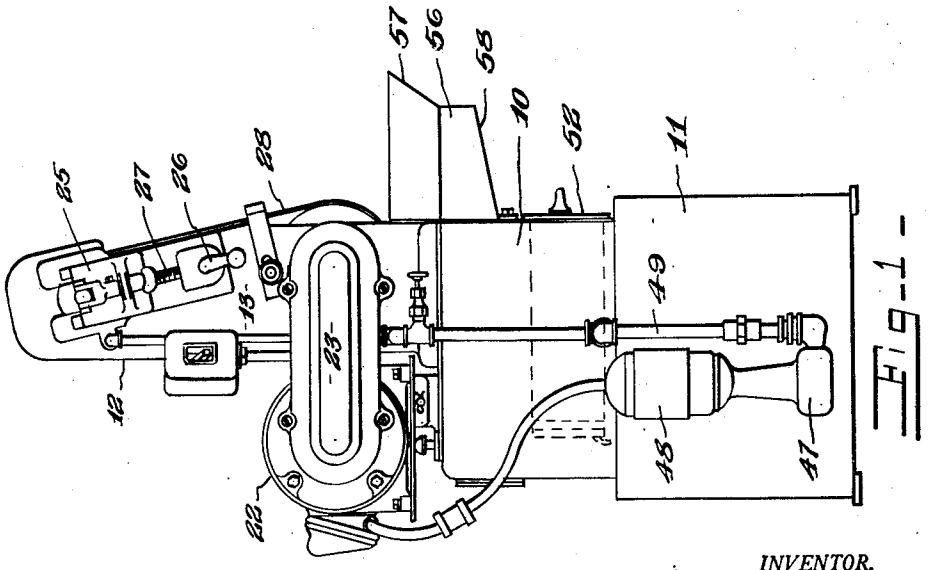


Fig-1-

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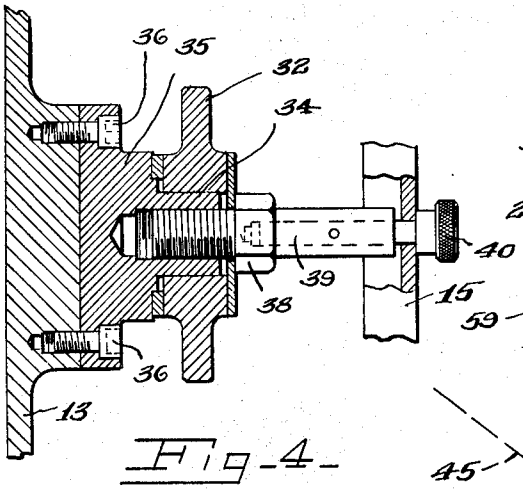


Fig-4-

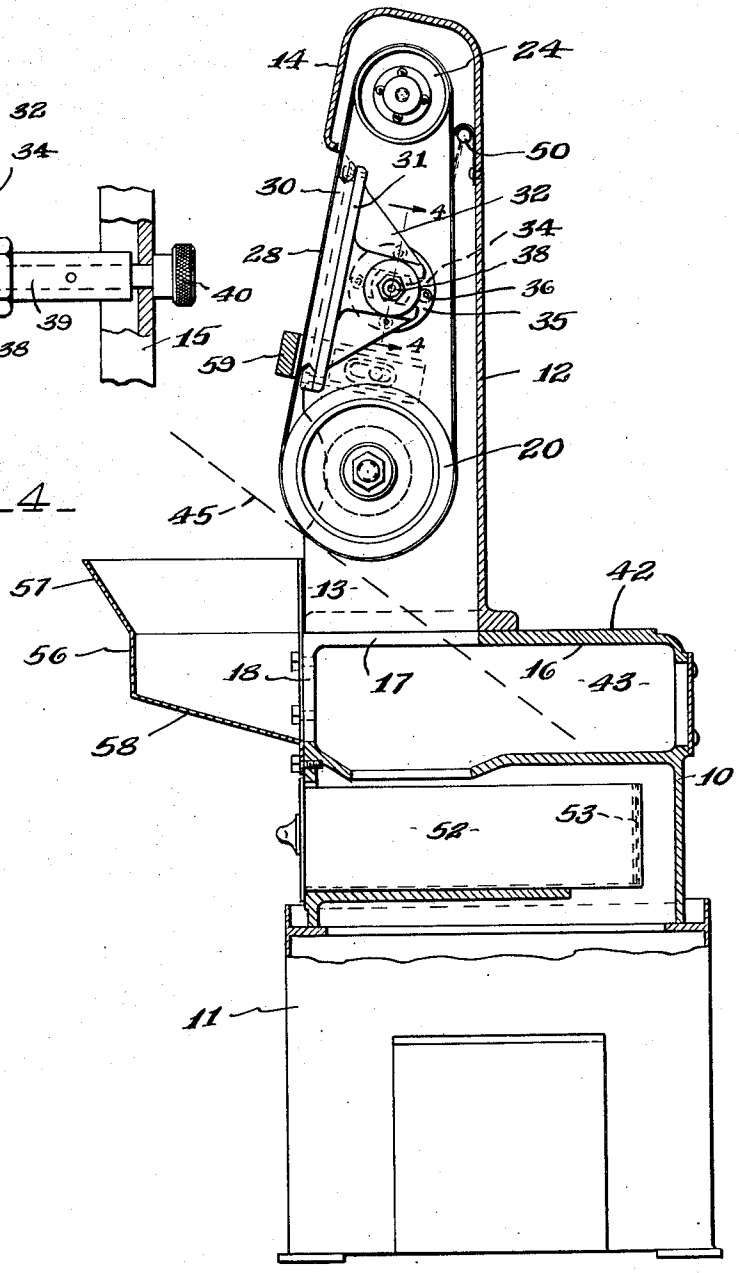


Fig-3-

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GRINDING MACHINE

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3 Claims. (Cl. 51—135)

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This invention relates to grinding machines of the abrasive belt type, and has as a general object a machine of this type embodying a structure by which both line contact and platen operations can be performed consecutively with a minimum of effort and time, the arrangement being such that the structure for the platen operation does not in the least interfere with line contact grinding, or buffing.

The invention has as a further object a machine embodying the advantages above referred to and wherein the structure is such that elongated pieces of work can be ground or buffed in the same manner that those operations are now performed on a conventional exposed grinding or buffing jack.

The invention consists in the novel features and in the combinations and constructions hereinafter set forth and claimed.

In describing this invention, reference is had to the accompanying drawings in which like characters designate corresponding parts in all the views.

Figure 1 is a side elevational view of a machine embodying my invention.

Figure 2 is a front elevational view of the machine.

Figure 3 is a side elevational view, looking to the left in Figure 2, with the upper portion of the frame in section.

Figure 4 is a fragmentary sectional view taken on line 4—4, Figure 3, illustrating the mounting of the platen.

The machine consists of a vertically extending enclosed frame in which a contact roll, pulley and platen are mounted, and provision is made for supplying a coolerant fluid to the abrasive belt and for receiving chips produced during the grinding or buffing operations.

The frame consists of a base section 10, the lower portion 11 of which forms a relatively large tank for the coolerant fluid. The upper portion of the frame is in the nature of a housing having a rear wall 12, side wall 13, and a forward wall 14. The housing is enclosed by a door 15 hinged to the rear wall 12 and forming, when closed, a side wall opposite the wall 13. The upper wall 16 of the base portion 10 is provided with an opening 17, and the forward wall thereof with an opening 18. The upper housing is mounted over the opening 17 and communicates with the interior of the base 10.

The forward wall 14 of the upper housing inclines rearwardly at an angle in the neighborhood of 15°. A contact roll 20 is arranged in the lower portion of the housing and is journalled in the side wall 13 thereof, and is operatively connected with a driving motor 22 mounted exteriorly of the housing on the frame, the connection being such as to effect rotation of the contact roll, as by conventional pulleys and belts arranged within the enclosed guard 23.

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An idler pulley 24 is journalled in the upper end of the housing on a block 25 which is adjustable toward and from the contact roll by means of the crank 26 and screw 27. An abrasive belt 28 is trained over the contact roll 20 and the upper pulley 24. The axis of the pulley 24 is adjusted to properly track the belt by a screw 29. The forward inclined wall of the upper portion of the frame is provided with an opening to expose the outer run of the belt, and this opening extends downwardly below the contact roll 20, see Figure 3. The exposed portion of the belt is backed up by a platen 30 mounted upon a support 31 having a rearwardly extending web 32 formed with an open slot to receive a shank 34 extending inwardly from a pad 35 secured to the side wall 13 of the housing, as by screws 36. The shank 34 is flattened off on the upper and lower sides, whereby the platen support 31 is adjustable toward and from the outer run of the belt, but is held against rotation about the axis of the pad 35. The support is secured in adjusted position by means of a stud 38 threading into the shank 34 and clamping the web 32 against the pad, as shown in Figure 4. The stud 38 is formed with an outwardly extending projection 39 which is formed with a threaded bore to receive a screw 40 carried by the door 15 and which serves to secure the door in closed position. The purpose of the door is to expose the ends of the contact roll and pulley 24 to permit removal of the abrasive belt, and also to permit adjustment of the platen support 31.

The rear wall of the frame extends rearwardly, as at 42, to form a space or compartment 43 to permit elongated work pieces to be operated upon by the abrasive belt passing over the contact roll 13, as indicated by the dotted line 45.

With this arrangement, long pieces of work can be ground or buffed by extending them through the opening in the front wall of the frame and the opening 17 in the top wall of the base member, and during such operation the exposed portion of the abrasive belt between the contact roll 20 and the pulley 25 does not cause any interference or inconvenience due to the fact that this portion of the belt inclines rearwardly, see Figures 1 and 3.

A coolerant pump 47 is mounted upon the lower portion 11 of the frame and is operated by a motor 48, the pump having a discharge pipe 49 extending upwardly of the side wall 13 and inwardly through said wall to a discharge nozzle 50 which functions to atomize the coolerant and discharge the same against the rear run of the belt 28. This arrangement creates a mist of coolerant within the upper housing of the frame and provides a supply of coolerant to the belt.

Excess coolerant is thrown from the belt against the forward wall 14 as the belt travels over the upper pulley 24, and this excess coolerant is available to flow down the exposed portion of the belt and is discharged together with the chips from the grinding operations as the belt travels around the contact roll 20. A chip receiving drawer 52 is arranged in the frame below the contact roll 20 and is provided at its inner end with a series of screens 53 to permit the coolerant to discharge into the tank portion 11 from whence it is continually re-circulated by the pump 47. The forward wall of the frame is provided with a trough 56, the upper walls of which flare outwardly, as at 57, and the bottom wall 58 of which inclines downwardly through the opening 18 to discharge any coolerant or material that may be discharged from the belt 28. A work rest 59 extends across the face of the belt in proximity to the lower end of the platen 30 and is adjustably mounted upon the side wall 13 of the upper housing.

It will be apparent that a wide variety of grinding and buffing operations can be quickly and conveniently performed on this machine. For example, all grinding operations, such as flat grinding, bevels, radii, etc., usually performed on a platen type grinder, can be done on this machine and, in addition thereto, all free hand grinding and buffing operations can be done on the portion of the belt in contact with the contact roll 20, including work pieces of long or irregular shape, and all of these operations are performed while the belt is supplied with a coolerant which heretofore has not been practical with the conventional wheel type grinding and buffing jacks.

What I claim is:

1. A grinding machine of the type described comprising a hollow base, a vertically extending enclosed housing mounted on said base, a contact roll journalled in the housing, a pulley journalled in the housing above the contact roll, an abrasive belt trained over said roll and pulley, the forward and bottom walls of said housing being formed with an opening, the opening in the forward wall being arranged to expose a portion of said abrasive belt and the forward portion of the periphery of said contact roll, and said opening extending a substantial distance below said roll, the top and forward walls of said base being formed with an opening in register with the opening in the bottom and forward walls of said housing, the top wall of said base extending rearwardly from the housing to permit elongated work pieces to be moved into engagement with the abrasive belt on the lower portion of said contact roll, and motion transmitting means to effect rotation of said roll.

2. A grinding machine of the type described comprising a hollow base member, a vertically extending enclosed housing mounted on the top wall of the base and being formed with an opening in the forward wall and the bottom wall, a contact roll journalled in the housing with the periphery of said roll extending through the opening in the forward wall of the housing and forwardly of said forward wall, a pulley journalled in the housing above said contact roll, an abrasive belt trained over said roll and pulley and having an intermediate portion exposed through the opening in the front wall of the housing, the top and forward walls of said base being formed with openings in register with the openings in the bottom and forward walls of said housing, the top wall of said base extending rearwardly from the housing to permit elongated work pieces to be manipulated through said openings into engagement with the abrasive belt on the lower portion of said contact roll, and motion transmitting means to effect rotation of said roll.

3. A grinding machine of the type described comprising a hollow base, an enclosed housing formed with an opening in the lower portion of the forward wall and in the bottom wall thereof, the top and forward walls of said base member being formed with openings, and said housing being mounted upon the base with the openings in the housing in register with the openings in said base, the forward wall of the housing inclining rearwardly and upwardly, a contact roll journalled in the housing with the forward portion of the roll extending forwardly through the opening in the front wall of the housing, a pulley journalled in the upper portion of the housing, an abrasive belt trained over said contact roll and pulley with a portion of the belt exposed through the opening in the forward wall of the housing, a platen mounted in the housing in back of the exposed portion of said belt, said platen being inclined rearwardly and upwardly from said contact roll, the top wall of said base extending rearwardly from the rear wall of the housing to permit elongated work pieces to be manipulated through said openings against the under portion of said contact roll, and motion transmitting means operable to effect rotation of said roll.

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