Feb. 25, 1969 S. HALL 3,429,305

AUTOMATIC GRINDING WHEEL DRESSER

Filed Sept. 30, 1966 Sheet 1 of 2

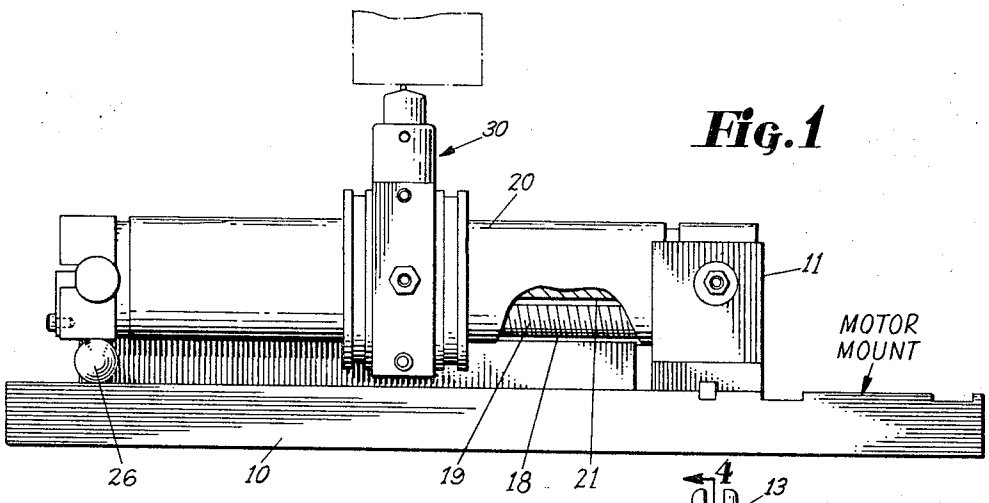


Fig. 1

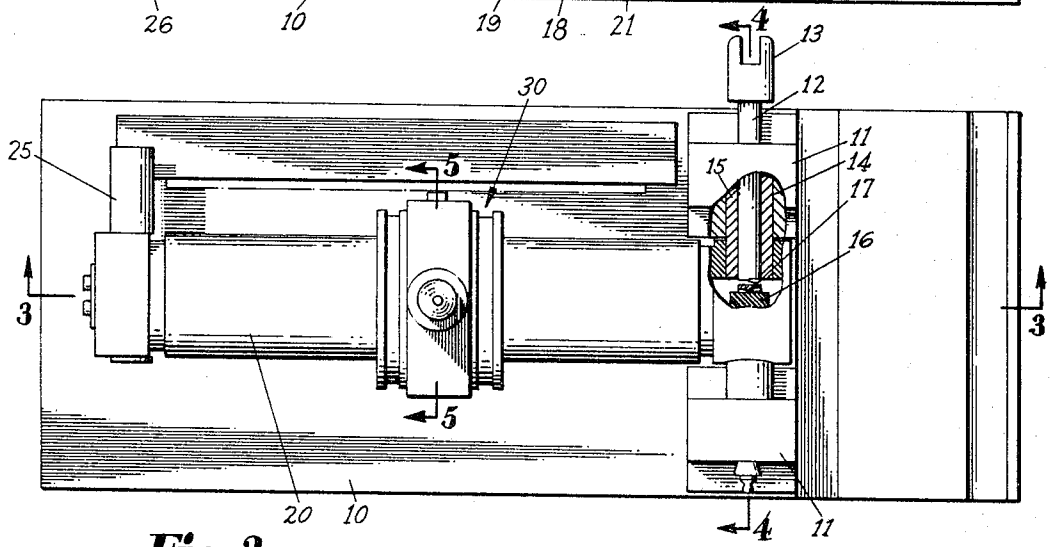


Fig. 2

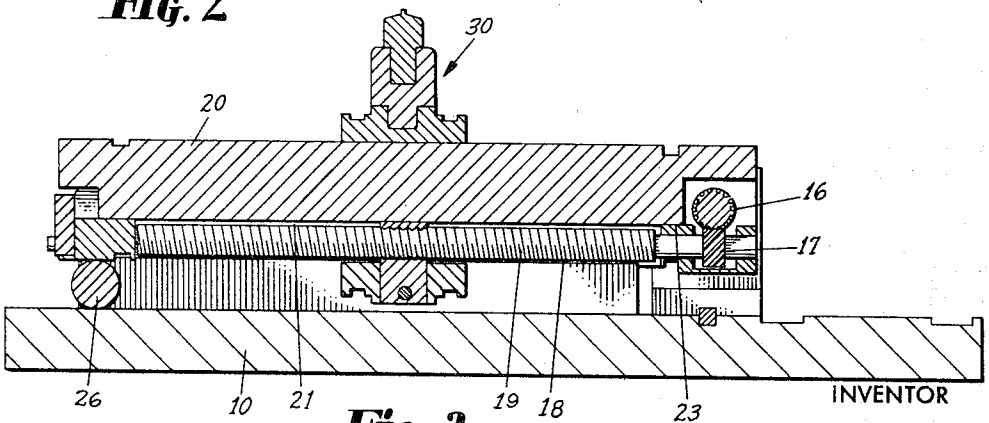


Fig. 3

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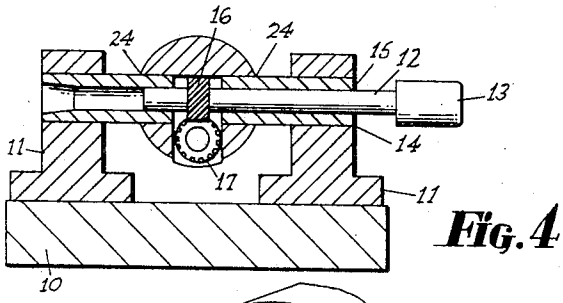


Fig. 4

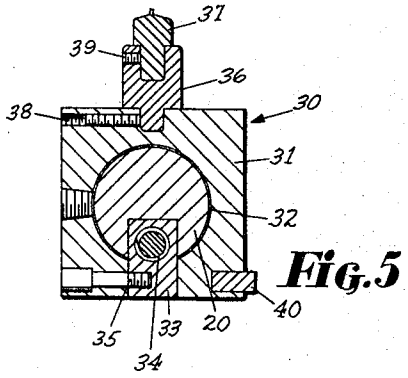


Fig. 5

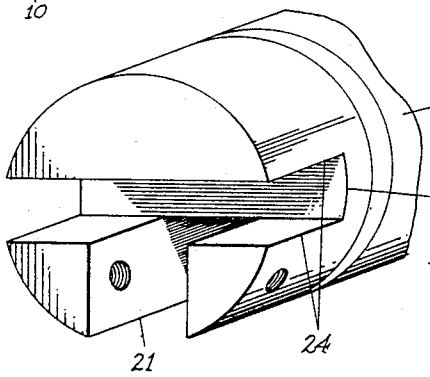


Fig. 6

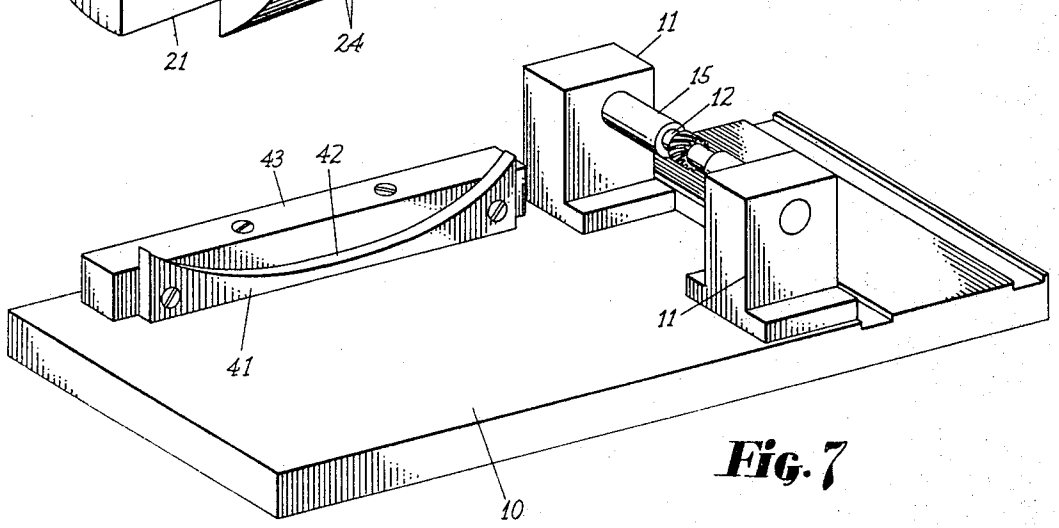


Fig. 7

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AUTOMATIC GRINDING WHEEL DRESSER

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U.S. Cl. 125—11 5 Claims
Int. Cl. B24b 53/08

ABSTRACT OF THE DISCLOSURE

A device for the automatic dressing of grinding wheels and the like which includes a dressing tool concurrently movable along a line and in a plane so as to dress a grinding wheel to a preselected contour.

Heretofore, it was sometimes necessary to stop the grinding operation, the grinding wheel having become clogged with oils, grit, etc., then redress the wheel prior to further use thereof. This resulting down time was lost time. And since it was necessary to maintain a particular contoured edge on the grinding wheel, the intermittent operation arose with greater frequency. For the cleaning, hand dressing by a skilled craftsman eventually gave way to machine dressing. But the result was only a lessening of the down time. Further, the devices which could be attached to a grinding machine were many times cumbersome to handle or at most limited in their ability to produce the intricate contours required.

It is therefore an object of this invention to provide a device which may be easily attached to the grinding machine for dressing the wheel concurrently with the grinding operation.

A further object of this invention is the provision of means for contouring the grinding wheel to exacting requirements.

An additional object of this invention is to provide a new and improved dressing device which is portable and adaptable for use in conjunction with grinding operations.

Another object of this invention is the provision for the unique arrangement of parts whereby the rotating screw shaft, upon which the dressing head is mounted, may be pivoted.

Further objects and advantages will become apparent from the following description and claims and are illustrated in the accompanying drawings wherein:

FIGURE 1 is a front elevation of the automatic grinding wheel dresser made according to the instant invention.

FIGURE 2 is a top view of the device shown in FIGURE 1 with a portion cut away and in section.

FIGURE 3 is a cross sectional view taken on the line 3—3 of FIGURE 2.

FIGURE 4 is a cross sectional view taken on the line 4—4 of FIGURE 2.

FIGURE 5 is a cross sectional view taken on the line 5—5 of FIGURE 2.

FIGURE 6 is an enlarged perspective view of the traveler rod taken at the section line 4—4.

FIGURE 7 is a perspective view of the base with the traveling mechanism removed to illustrate certain hidden details.

Briefly, in the practice of this invention, a rectangular base, with a motor mounted at one end, is provided for attachment to the chuck of a grinding machine. Intermediate the ends of the base and running transversely thereof is a worm gear drive shaft to be driven by said motor. Intermediate said shaft and perpendicular thereto is a meter screw having a helical gear secured to one end for engagement with the worm gear drive shaft. The helical gear is received in a longitudinal groove of a circular

traveler rod. Mounted on and surrounding the traveler rod, so as to traverse the traveler rod, is a traveling carriage atop which is mounted a dresser chuck which holds the dresser bit. Thus, by rotating the helical gear, the traveling carriage is caused to move along the traveler rod whereby a grinding wheel in contact with the bit may be dressed.

The entire traveler and meter screw mechanism is rotatable on a transverse axis parallel to the drive shaft at the point where the drive shaft meshes with the helical gear, thereby permitting continued operation even though the entire traveler and meter screw mechanism may be moving up and down. By this unique arrangement and cooperation of parts, the traveler mechanism can be adopted to ride a longitudinally disposed template having the unusually shaped contour desired on the grinding wheel surface.

By this brief description, it should be apparent that the device of this invention is compact and light weight and may be readily mounted on the chuck or table adjacent to and below the grinding wheel for dressing simultaneously with the grinding operation.

Turning now to a more detailed description of the invention, FIGURES 1 and 2 show an essentially rectangular base **10** having vertical projections **11** for receiving drive shaft **12**. At the outset, it should be understood that a motor, reversible if desired, may be mounted at one end of base **10** to turn shaft **12** at the extension **13** therefrom. It should further be understood that appropriate gears for reducing or reversing the drive may be provided to vary the speed of drive shaft **12**.

The vertical projection **11** is provided with a bore **14** for receipt of a cylindrical collar or spacer **15** having a bore which in turn is adapted to receive drive shaft **12** for rotational movement therein. A further function of spacer **15** will be made apparent hereinafter.

As a means to transmit motion from drive shaft **12**, a worm gear **16** is provided at a center location thereon. Operating from gear **16** is helical gear **17** mounted at one end of meter screw **18**, said screw being disposed below and perpendicular to drive shaft **12**. Meter screw **18** is threaded **19** nearly its entire length to permit longitudinal movement of the dresser bit housing. This will be described in more detail later.

The traveler rod **20** is essentially an elongated circular block with a rectangular recess **21** on the under side and running the full length of the member. This is best revealed by the perspective view illustrated in FIGURE 6. The recess **21** is such that it overrides meter screw **18** but not in contact therewith. To further insure against any relative movement therebetween the meter screw **18** but not in contact therewith. To further insure against any relative movment therebetween the meter screw **18** and recess **21**, key **22** may be used to contact a reduced section **23** of meter screw **18**.

The traveler rod **20** is further provided with a transverse recess **21***a* at one end thereof, above and communicating with recess **21**. It is at the enlarged cavity portion, formed by the intersecting recesses **21** and **21***a*, that worm gear **16** and helical gear **17** mesh. The axis of the transverse recess **21***a* is the axis of rotation for the traveler rod **20**. This rotation is accomplished by receiving at **24** within the last named recess the spacer **15**; see FIGURE 4.

At the opposite end of the traveler rod **20**, an arm **25** extending perpendicularly to said rod is mounted to facilitate movement of the free end of rod **20**. For example, if a beveled edge is required on the grinding wheel, a gauge block may be set under the arm to give the desired angle to the dressing mechanism. A further element of the last mentioned end of said traveler rod is a rest **26**. This rest maintains the parallelism between the dresser bit travel and the base **10**.

Turning now to the dressing mechanism, indicated generally at **30** in FIGURE 5, it will be seen that it comprises a housing **31** having a bore **32** therethrough. The cross-section of bore **32** is slightly greater than the cross-section of traveler rod **20** such that with a minimum of friction and slipping, the housing **31** will readily slide over rod **20**. This movement may be eased by the use of a lubricant. The longitudinal movement of housing **31** is caused by the action of meter screw **18**. In FIGURE 5 there is shown a key **33**, which may be bronze to avoid galling by the steel screw **18**, which is adapted to slide in the recess **21**. The key **33** further contains a threaded bore **34** which engages threads **19** of meter screw **18**. Thus, by rotating screw **18**, key **33** is caused to move axially carrying with it housing **31**. The latter two members may be joined together such as by set screew **35**. Secured on the outside and opposite the key **33** is the dresser chuck **36** and dresser bit **37**. Since quick replacement of these parts may be necessary, it is contemplated that set screws **38** and **39** be provided. A final element of the dressing mechanism **30** is the tracer **40** projecting rearwardly from housing **31**. It has been found important in operations such as contemplated here that the dressing machine be capable of producing various contours on the grinding wheel. For example, FIGURE 7 illustrates by the use of template **41**, a curved contour which may be transferred to a grinding wheel upon which the device operates. This was effected by allowing the tracer **40** to follow the path formed by the upper surface **42** of template **41**. While a simple shape has been shown for the template **41**, it should be understood that a variety of contours may be employed. With only a little effort, a new template may be secured to the support **43**, which in turn is attached to base **10**.

It should therefore be apparent that by this simple arrangement of parts, a variety of angles or shapes may be imparted to a grinding wheel edge, all with a minimum of effort by the operator.

Having described the invention in its most preferred embodiments, it should be understood that various modifications may be made therein without departing from the spirit and scope of this invention. It is therefore intended that no limitation be imposed herein except as set forth in the appended claims.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. An automatic grinding wheel dressing device comprising in combination, a base, a drive shaft mounted for rotational movement thereon, a gear integral with said shaft, a screw shaft meshing with said gear and rotatable about said drive shaft at a right angle thereto, an elongated traveler rod housing said screw shaft and mounted on said base for pivotal movement about said drive shaft, and grinding wheel dressing mechanism including a dressing tool slidably received on said traveler rod and threadably engaged with said screw shaft, whereby rotation of said drive shaft results in the movement of said grinding tool in a direction perpendicular thereto and said tool may be moved about said drive shaft.

2. The structure claimed in claim **1** including a template attached to said base, and a tracer projecting from said dressing mechanism and adapted to be engaged by said template during the movement of said dressing mechanism.

3. The structure claimed in claim **1** and further including a pair of spacers surrounding said drive shaft and secured within a slot in said traveler rod.

4. The structure claimed in claim **3** wherein said gear integral with said drive shaft is a worm gear intermediate said pair of spacers.

5. The structure claimed in claim **3** and further including a helical gear at one end of said screw shaft, whereby said helical gear meshes with said worm gear causing said screw shaft to be operative by activation of said drive shaft.

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