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2,809,474

WHEEL DRESSER

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Fig. 1.

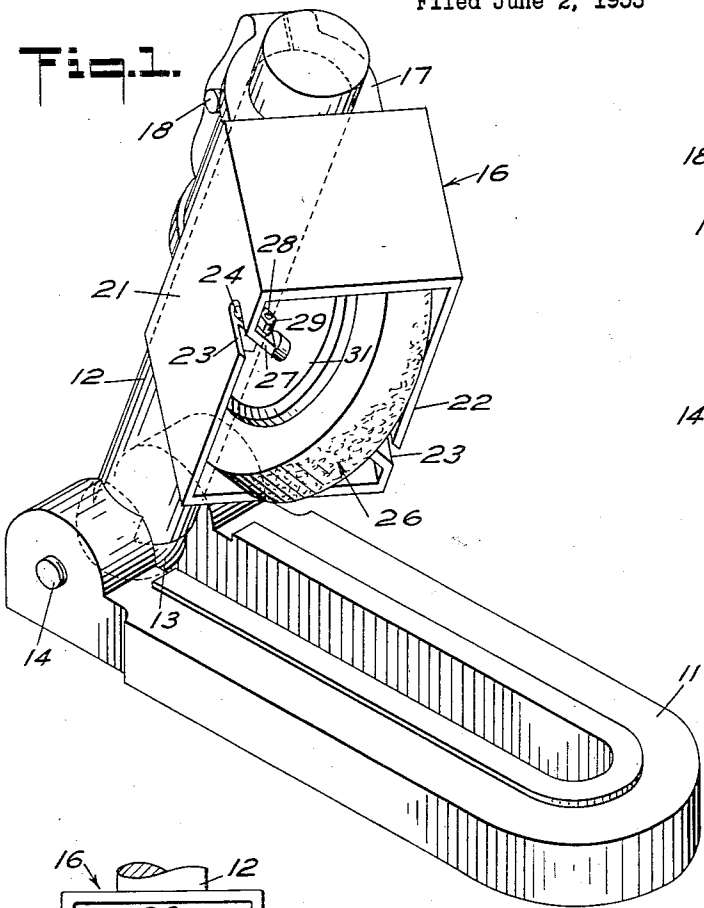
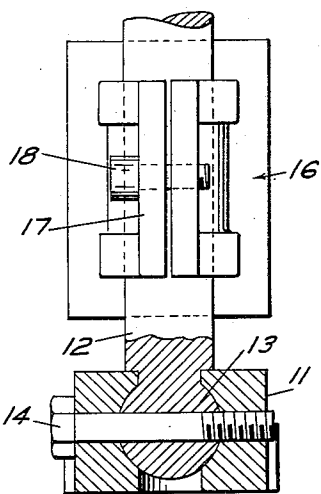


Fig. 3.

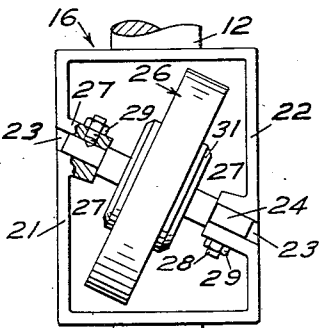


Fig. 4.

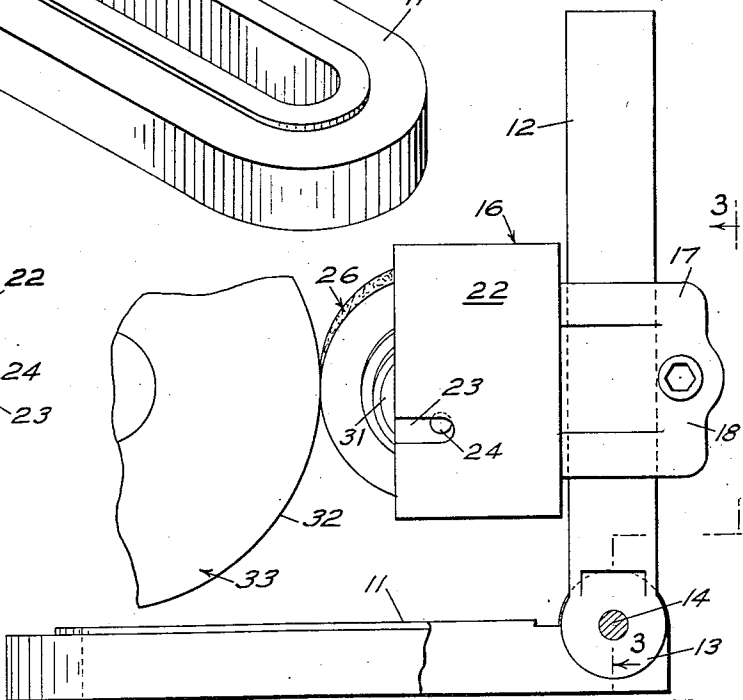


Fig. 2.

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WHEEL DRESSER

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4 Claims. (Cl. 51-166)

The present invention relates to improved means for dressing grinding wheels and this application is a continuation in part of my co-pending application for Method and Apparatus for Dressing Grinding Wheels, Serial No. 244,527, filed August 31, 1951, now abandoned.

Grinding wheels which are widely used for finishing metal parts by abrasion become worn unevenly so as to provide an irregular wheel surface that is unsuited for precision grinding. Although the grinding wheel surface may be worn through use, a large amount of abrasive material remains upon the wheel so that it has become common practice to periodically dress or true grinding wheels, whereby the wheel surface or face is refinished so that it is again smooth and true. This dressing process may be accomplished by traversing a diamond cutter across the surface or face of the grinding wheel while same is rotated; however, numerous disadvantages attach to this method not the least of which is the difficulty of producing a really true grinding wheel surface.

Inasmuch as grinding wheels employed in industry are commonly in constant or repeated use, and, further, in view of the fact that various types of grinding wheel mountings and sizes are widely employed, there is a need for a simple, inexpensive and highly accurate means for dressing grinding wheels in place which may be readily utilized by the grinding wheel owner or operator.

The present invention has these capabilities in that it includes a small abrasive wheel requiring no independent drive means and being readily adjustable and adaptable to all types of grinding wheel installations and, in fact, to all types of abrasive means, such as surface grinders, cylindrical grinders, bench or pedestal grinders, or abrasive belts.

The present invention contemplates the provision of a small abrasive wheel mounted for free rotation at a fixed angle relative to its base member and including an improved mounting having adjustable pivotal and rotational motion whereby the abrasive or dressing wheel is readily positioned in contact with the surface of a grinding wheel to be dressed. The placement of the dressing wheel surface in contact with the face or peripheral grinding surface of a grinding wheel that is driven causes the dressing wheel to be rotated by the grinding wheel. By disposing the dressing wheel axis at an angle to that of the grinding wheel, the dressing wheel will be driven at a slower speed to produce an abrasive action between the wheels, whereby the grinding wheel face is resurfaced. Actually the grinding wheel applies a force to the dressing wheel periphery that may be resolved into one force tangential to the dressing wheel and one force at right

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angles thereto, and this latter force produces the resistance and relative rotative speeds between the wheels, causing the grinding.

It will be readily appreciated that the relative angle of the grinding and dressing wheels determines the components of rotational and grinding force applied, for if the axes of the two wheels were parallel, substantially no grinding would result, and if the axes were disposed at right angles, no rotational force would be imparted to the dressing wheel. While a choice of angles between these two extremes is possible, it has been found that a relative angle of about thirty degrees is highly advantageous.

It is an object of the present invention to provide an improved grinding wheel dresser employing a freely rotating dressing wheel adapted for angular engagement with the surface of a grinding wheel to be dressed or trued.

It is an object of the present invention to provide an improved grinding wheel dresser adapted for dressing a grinding wheel in place, and including means for ready mounting thereof while maintaining a desired angular disposition of the dressing wheel relative to the grinding wheel.

The invention possesses other objects and features of advantage, some of which, with the foregoing, will be set forth in the following description of the preferred form of the invention which is illustrated in the drawings accompanying and forming part of the specification. It is to be understood, however, that variations in the showing made by the said drawings and description may be adopted within the scope of the invention as set forth in the claims.

A preferred embodiment of the invention is shown in the drawing wherein:

Figure 1 is a perspective view of the grinding wheel dresser;

Figure 2 is an elevational view of the grinding wheel dresser in engagement with a grinding wheel;

Figure 3 is a sectional view taken 3-3 of Figure 1;

Figure 4 is a bottom plan view of the dressing wheel and housing therefor.

Considering now the structural details of the illustrated embodiment of the invention, and referring to the drawings, there will be seen to be provided an elongated base member 11 having a central vertical slot therein to provide convenient means for mounting same upon a grinder. Base member 11 may be formed as a flat narrow U-shaped member, as shown, for engagement with the pivotal mounting of a cylindrical support bar 12 which has a spherical lower end 13 that mates with hemispherical indentations in the mutually presented surfaces at the free ends of U-shaped base member 11. Locking means for support bar 12 is provided by a bolt 14 extending through aligned apertures in the ends of the U of base member 11 and the spherical end 13 of support bar 12. Bolt 14 is threaded into one end of base member 11 so that upon tightening the bolt to bring the head thereof tightly against the outside of the untapped end of base member 11, the base member ends tightly grip the spherical bar end 13 and prevent movement thereof. Further, locking bolt 14 limits the degree of freedom of support bar 12 so that same is pivotable only in a plane normal to base member 11 and through the center thereof.

Mounted upon support bar 12 is a housing 16 by

means of clamping means 17 that is rigidly attached to housing 16 and which includes a pair of generally parallel plates having a cylindrical bore defined therebetween for engagement with support bar 12. Thus support bar 12 extends through clamping means 17 in contact with the semi-cylindrical wall of each of the side plates thereof so that the clamping means 17 is slideable along support bar 12 and may be rotated thereabout. Clamping means 17 operates to clamp support bar 12 and hold housing 16 in fixed relation thereto by means of a cap screw or bolt 13 extending through the two plates of the clamping means 17 on the opposite side of support bar 12 from housing 16 and threadably engaging one of the clamping plates so that tightening of screw 13 urges the plates of clamping means 17 against the support bar 12, thereby preventing relative motion therebetween.

While housing 16 may have any one of a variety of configurations, it is shown as a rectangular open-faced box having the clamping means 17 rigidly secured to the exterior of the back side thereof opposite the open face. There is provided in the opposite generally vertical sides 21 and 22 of housing 16, a pair of aligned slots 23 which in line are directed at an angle to the housing ends and also to support bar 12 which extends in line with the housing edges.

Within housing 16 there is mounted a shaft 24 which extends through the aligned slots 23 in the housing sides and which carries an abrasive dressing wheel 26. Shaft 24 may be mounted within housing 16 by means of lugs 27 attached to the side walls 21 and 22 of housing 16 and extending inwardly thereof along slots 23, with two lugs being attached to each side wall to form slot extensions. The shaft extends across the open face of housing 16 into the slots 23 in the side walls of the housing and thus between the pairs of lugs 27 on each wall. A threaded aperture is provided in the top lug on wall 21 and the bottom lug on wall 22 disposed slightly away from the maximum slot depth and directed generally perpendicularly of shaft 24. Threaded headless bolts 28 are disposed within these apertures and are provided with pointed ends so that upon being threaded into the lug apertures their tapered ends engage shaft 24 in slots 23 on the side thereof adjacent the open housing face so that the shaft 24 is tightly held between the bolt ends and the slot bottom. These bolts 28 may be locked in position by nuts 29 threaded upon the outer ends thereof and tightened against the lugs 27 through which the bolts extend. The bolts 28 may be readily threaded into the apertures in lugs 27 by means of an hexagonal indentation provided in the outer ends of the bolts into which a key or wrench of the "Allen" type is mated and openings may be provided in the top and bottom of the housing for convenient access to the bolt ends with such a key or wrench.

The dressing wheel 26 is formed of a very hard abrasive material and is mounted for rotation upon shaft 24 as by means of a bearing assembly 31 such as a ball bearing and including a stationary member connected to dressing wheel 26 and confined rolling means engaging the shaft 24. The dressing wheel 26 is maintained in fixed position longitudinally of shaft 24 as by means of shaft flanges disposed on opposite sides of the wheel about the shaft; however, various types of wheel mountings are suitable so that same is not here described in detail.

From the foregoing it will be seen that the improved wheel dresser generally comprises a base member adapted for mounting upon or adjacent equipment including a grinding wheel. The dressing wheel 26 of the invention is mounted for free rotation upon a shaft 24 that is in turn mounted in fixed position within the housing 16 at an angle across the open face thereof so that the dressing wheel extends through this open face for peripheral engagement with the face 32 of a grinding wheel 33, as shown in Figure 3 of the drawings. Provision is made for positioning the dressing wheel 26 in contact with the

grinding wheel face by the means mounting the dressing wheel 26 upon the base member 11 and including support bar 12 and clamping means 17. The housing 16 and dressing wheel 26 are afforded certain degrees of latitude by the mounting means and these include pivoting through a plane perpendicular to the base member through the longitudinal axis thereof by the spherical end 13 of support bar. Also, the housing 16 may be rotated about support bar 12 and slid longitudinally thereof by clamping means 17. By these movements or adjustments the dressing wheel is readily placed in engagement with the face 32 of a grinding wheel 33, while the wheel dresser base 11 is mounted in fixed relation to the grinding wheel 33. It is to be noted that even though the housing carrying the dressing wheel 26 is adjustable in various ways, there is maintained a particular relation between the axis of the dressing wheel 26 and the base member 11 or the plane thereof. Thus the bottom surface at least of base member 11 is planar and is intended to be mounted with same parallel to the axis of the grinding wheel 33 to be dressed or trued. With the grinding wheel axis parallel to the plane of base member 11, adjustment of housing 16 to place dressing wheel 26 in contact with the grinding wheel face 32 will always produce the same angular relation between the grinding wheel axis and dressing wheel axis. This is true because the dressing wheel axis or shaft remains at a fixed angle to the base plane throughout the adjustment or positioning of housing 16 carrying the dressing wheel. Consequently there is provided by the present invention an improved dressing means for grinding wheels adapted to true or dress a grinding wheel in place by improved mounting and positioning means and disposing a freely rotatable dressing wheel in peripheral engagement with the grinding wheel face in predetermined angular relation thereto for rapid, accurate and efficient grinding wheel dressing.

What is claimed is:

1. A portable grinding wheel dresser comprising a base member adapted for rigid mounting adjacent a grinding wheel to be dressed, a shaft disposed at a constant angle to said base member in a plane normal to the latter, a dressing wheel mounted for free rotation upon said shaft and formed of an abrasive material, and mounting means engaging said shaft and base member for varying the relative disposition thereof about a first axis included in the plane of said base member and about a second axis normal to said first axis without changing the angular disposition of same in a plane normal to the base member whereby said dressing wheel is disposable in contact with a grinding wheel to be dressed and in a predetermined angular relation thereto.

2. An improved grinding wheel dresser as defined in claim 1, further characterized by said mounting means including a support bar pivotally engaging said base member for displacement in a plane normal thereto and clamping means secured to said shaft and engaging said support bar in rotational and slidable relation thereto.

3. Improved means for dressing a grinding wheel comprising a housing having an open side, a shaft mounted in said housing angularly across the open side thereof, a dressing wheel mounted for rotation upon said shaft and extending exteriorly of said housing through the open side thereof, a cylindrical support bar, clamping means rigidly secured to said housing opposite the open side thereof and having a cylindrical aperture therein through which said support bar extends in slidable and rotational relation thereto, the plane of said wheel defining a constant acute angle to the axis of said bar, and a portable base member adapted for mounting adjacent a grinding wheel to be dressed and engaging said support bar in pivotal relation whereby said dressing wheel is movable into peripheral contact with a grinding wheel at a predetermined angle to said grinding wheel.

4. An improved portable grinding wheel dresser comprising a rigid base member, a support bar pivotally

mounted upon said base member and extending therefrom, locking means for securing said support bar in pivoted disposition relative to said base member, clamping means releasably engaging said support bar in slidable and rotational relation thereto, an open faced housing 5 rigidly secured to said clamping means with the open face thereof positioned remote from said bar, a shaft removably disposed within said housing across the open face thereof at a fixed acute angle to the axis of said bar, and a dressing wheel formed of abrasive material 10 mounted for rotation upon said shaft and adapted for peripheral engagement with a grinding wheel at an angle thereto for rotation thereby and dressing thereof.

References Cited in the file of this patent

UNITED STATES PATENTS

1,440,338	Buswell	Dec. 26, 1922
1,715,835	Hohnhorst	June 4, 1929
1,860,614	Hohnhorst	May 31, 1932
1,958,534	Dunbar	May 15, 1934
2,067,531	Indge	Jan. 12, 1937
2,217,145	Stihl	Oct. 8, 1940
2,612,009	Tavano	Sept. 30, 1952