April 29, 1958 C. H. NEWBOULD 2,832,329

GRINDING WHEEL DRESSING DEVICE

Filed Dec. 5, 1955 2 Sheets-Sheet 1

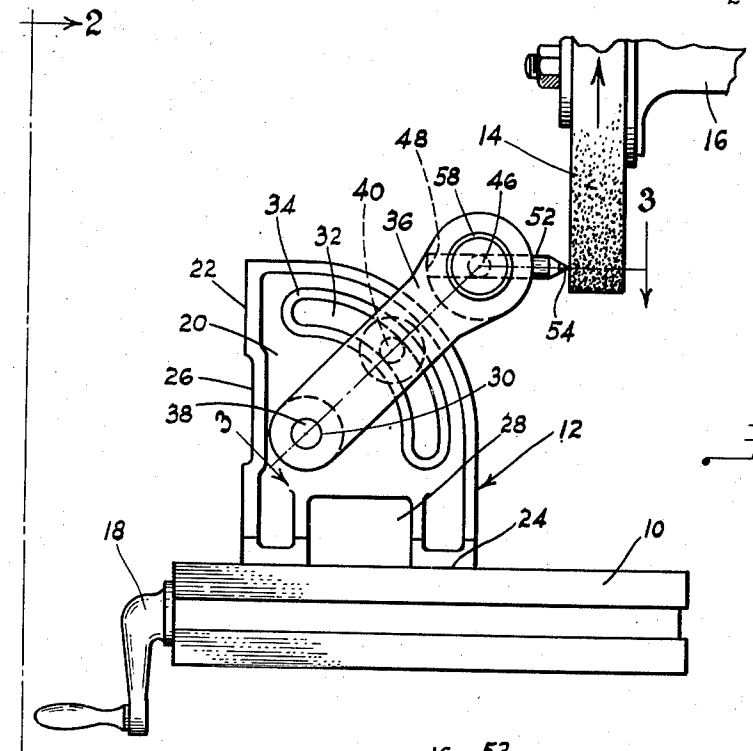


Fig. 1

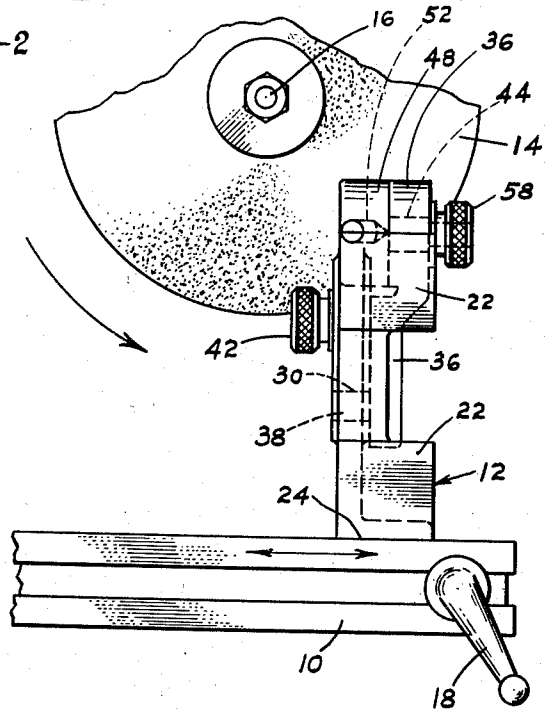


Fig. 2

INVENTOR.
CHARLES H. NEWBOULD
BY
ATTORNEY

April 29, 1958 C. H. NEWBOULD 2,832,329

GRINDING WHEEL DRESSING DEVICE

Filed Dec. 5, 1955 2 Sheets-Sheet 2

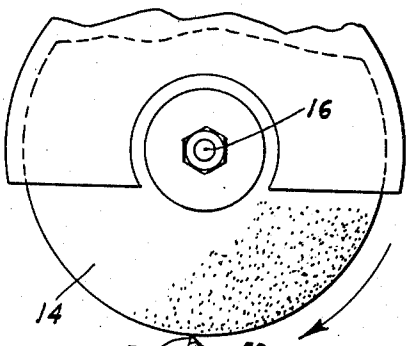


Fig. 4

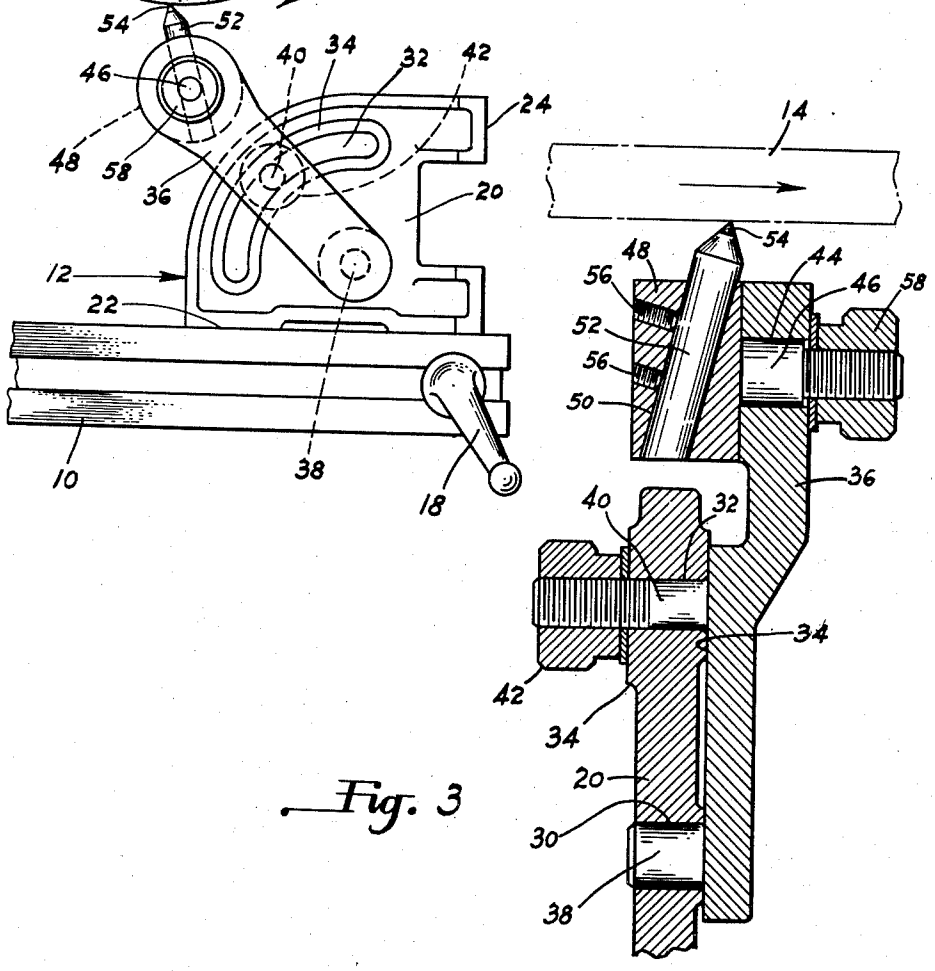


Fig. 3

INVENTOR.
CHARLES H. NEWBOULD

BY

ATTORNEY

United States Patent Office

2,832,329

Patented Apr. 29, 1958

2,832,329

GRINDING WHEEL DRESSING DEVICE

Charles H. Newbould, York, Pa.

Application December 5, 1955, Serial No. 550,950

4 Claims. (Cl. 125—11)

This invention relates to improvements in a grinding wheel dressing device and, more particularly, to a grinding wheel dressing device for use with various types of grinding machines such as surface grinders, cutter grinders, and the like.

A typical type of grinding wheel dressing device in use at present comprises a simple bar member having a diamond member fixedly positioned thereon so as to project at right angles from one surface of the bar. Particularly where such a dressing device is to be used to dress the curved face of a grinding wheel of a surface grinder having a magnetic chuck, the bar is placed upon the chuck and the latter is energized to hold the bar attached to the chuck. The diamond dressing tool then projects vertically from the chuck and the grinding wheel is lowered into contact with the diamond tool whereby, when the grinding wheel is rotated and the chuck is reciprocated horizontally upon its ways, dressing of the wheel takes place. However, under circumstances where it is necessary to dress a grinding wheel in the midst of a grinding operation, moving the wheel from its operative position into contact with the dressing tool presents the difficulty of restoring the grinding wheel to its operative position. Assuming that only a very limited amount of additional grinding was necessary to complete the grinding operation, the operator would have to blue the surface and carefully restore the grinding wheel into desired operative position to prevent the possibility of grinding the surface too much.

From the foregoing, it will be seen that the common practice is to move the grinding wheel to the dressing tool rather than vice versa. Some attempts have been made to devise grinding wheel dressing fixtures or tools wherein the dressing tool head which holds the dressing diamond, for example, is moved into engagement with the dressing wheel rather than vice versa. However, these devices principally have been quite elaborate, complicated, and hence relatively expensive, thereby deterring wide sale thereof.

It is the principal object of the present invention to provide a grinding wheel dressing device in which the holder for the dressing tool such as a diamond tool member is adjustably movable relative to a base member and when the dressing tool head has been moved into desired relationship to the wheel it is to dress, the adjustable members of the device are then locked in operative position while the base member is held attached for example to a magnetic chuck of a surface grinder, or the like. The connected elements which comprise the entire dressing device are relatively few in number, simple in construction, easily assembled, sturdy and durable so as to provide long life, and may be manufactured at a cost to permit the sale thereof for substantially less than adjustable dressing devices presently available on the market.

Another object of the invention is to provide a base member having a plurality of supporting surfaces thereon which selectively may be disposed against the flat supporting surface of a magnetic chuck for example and the pivot for an adjustably positionable arm on the base member is disposed at different distances from said several surfaces on the base member, whereby said pivot may selectively be disposed at different distances above the supporting surface of the magnetic chuck, thus providing a construction in which a supporting arm of limited length may be utilized to nevertheless afford a substantial range of positions for the tool holding head above the supporting surface on the grinding machine.

Details of these objects and of the invention, as well as other objects thereof, are set forth in the following specification and illustrated in the accompanying drawings comprising a part thereof.

In the drawings:

Fig. 1 is an end elevation of an exemplary surface grinder selected for purposes of illustrating a typical use of a grinding wheel dressing device embodying the principles of the present invention. In this view the side of the wheel is being dressed.

Fig. 2 is a view of the structure shown in Fig. 1 as seen at 90° to the position shown in Fig. 1 and wherein the dressing device is seen in end elevation.

Fig. 3 is an enlarged sectional view showing a fragmentary portion of the dressing device embodying the principles of the invention, said view being taken along the line 3—3 of Fig. 1 and being on a larger scale than Fig. 1.

Fig. 4 is a view similar to Fig. 2 but showing the dressing device positioned at 90° to the view shown in Fig. 2 so as to position the dressing tool against the curved face of the grinding wheel, whereas in the other figures the dressing device is positioned to dress the side of the grinding wheel.

For purposes of simplifying the illustration and description of the present invention, an exemplary surface grinder has been selected for purposes of describing the details and function of a dressing device embodying the present invention relative to the grinding wheel of such a grinding machine. However, it is to be understood that the invention device may be used with other types of grinders such as cutter grinders and the like. Referring to Figs. 1, 2 and 4, an exemplary magnetic chuck **10** is shown and upon the upper or working surface thereof is positioned a grinding wheel dressing device **12** embodying the principles of the present invention. A typical grinding wheel **14**, which is to be dressed, is rotatably supported by an arbor **16**. Current supplied to the magnets of the chuck **10** is controlled by a conventional switch operating handle **18**.

Referring to Figs. 1 through 3, the wheel dressing device **12** is positioned to grind the side of the grinding wheel **14**. Said dressing device comprises a base member **20** which, for example, may be formed from a suitable casting of steel or iron. Said base member has two flat surfaces **22** and **24** which extend transversely to the main plane of the base member **20** along different edges thereof. Said flat surfaces are at a right angle to each other and may be either continuous along the entire edges of the base member or the same may be interrupted, as clearly shown in Figs. 1 and 4, by notches **26** and **28**. Also, the transverse width of flat surfaces **22** and **24**, as viewed in Fig. 2, is much less than the length thereof as viewed in Fig. 1, whereby regardless of whether surface **22** or **24** is resting upon the face of chuck **10**, relatively little space is occupied by the dressing device **12** so as not to interfere with a work-piece already positioned upon the chuck **10** to be ground by wheel **14**.

Base member **20** also is provided with bearing means comprising a transverse bearing aperture **30**, the axis of which is parallel to the flat surfaces **22** and **24**. Further, the bearing aperture **30** is positioned farther from the

flat surface 24 than the flat surface 22 as is clearly shown in Figs. 1 and 4, but in both instances, the axis of aperture 30 is spaced from the surfaces 22 and 24 a distance less than half the lengths of said surfaces.

Extending through base member 20 is an arcuate slot 32 which comprises a segment of a circle having the axis of bearing aperture 30 as a center. Further, in casting the base member 20, it is preferred that the slot 32 be outlined by a flange 34 which may be suitably finished by machining or grinding so as to present a smooth flat planar surface disposed outwardly from the portion of the base member immediately adjacent the slot 32. Said portion incidentally may be made substantially thinner than the width of the flanges projecting from adjacent edges thereof and upon which the flat surfaces 22 and 24 are formed as is apparent from Fig. 2. Hence, the base member 20 may be cast from iron or steel so as to be relatively light in weight and economical in consumption of material.

The dressing device also comprises an arm 36 which has bearing means at one end cooperating with the bearing aperture 30, said means comprising a cylindrical shaft or pin 38 which is fitted within aperture 30 so as to be smoothly rotatable therein without appreciable looseness. Intermediately of the ends of arm 36, locking means project from the one surface thereof in the form of a threaded pin 40 which extends through arcuate slot 32. One surface of arm 36 slidably abuts against the smooth surface of one face of flange 34, while a threaded thumb nut 42 is engageable with the opposite smooth surface of flange 34 when threaded onto pin 40 for purposes of locking arm 36 in any desired position about the axis of bearing means 30 and 38.

The outer end of arm 36 also is provided with bearing means comprising a bearing aperture 44 which is parallel to the pins 38 and 40 for purposes of receiving a bearing shaft 46 which projects from one face of a rotatably supported tool holding head 48. Said head is provided with a tool receiving hole 50 which may be complementary in shape to any desired type of dressing tool 52 to be held therein. One common form of dressing tool 52 comprises a cylindrical shank having a diamond tip 54. The tool 52 may be held in operative position by any conventional means such as headless set screws 56, whereby the tool 52 may be rotated about its axis within head 48 from time to time in order that the diamond tip 54 may be maintained in sharp condition. Further, it will be noted that the axis of the tool receiving hole 50 is disposed at an angle other than 90° to the axis of shaft 46, thereby further facilitating the maintaining of the diamond tip in sharp condition. The tool holding head 48 may be locked in any angular position relative to arm 36 by means of a suitable thumb nut 58 threaded onto the outer end of shaft 46.

Due to the range of movement afforded the arm 36 relative to the base member 20, and also the pivotal support of the head 48 by the outer end of said arm, as well as the different spacings of the axis of the bearing means 30 and 38 respectively away from the flat surfaces 22 and 24, a substantial range of different positions of the dressing tool 52 relative to a grinding wheel as well as the supporting surface for the dressing device are afforded. For example, when the dressing tool is to be positioned relative to the chuck 10 so as to dress the side of a grinding wheel 14 as shown in Figs. 1 and 2, it may be desirable to afford greater spacing of the axis of bearing means 30 and 38 from the upper face of chuck 10, whereby the flat surface 24 is disposed against the upper face of chuck 10. The arm 36 is then suitably moved about the axis of bearing aperture 30 so as further to dispose the tool holding head 48 at a desired elevation relative to grinding wheel 14. Then, the locking means comprising thumb nut 42 is tightened to hold the arm 36 in said desired position of operation relative to base member 20. In addition, by loosening thumb nut 58, head 48 may be rotated to dispose the tip 54 of dressing tool 52 in desired position relative to the side of grinding wheel 14 as shown in Figs. 1 through 3, following which the thumb nut 58 is tightened and, in the event the current to the magnets within the chuck 10 has not been turned on, it then may be caused to energize the magnet by operating switch handle 18. The grinding wheel 14 then is rotated and suitably moved axially to effect a desired dressing of the side thereof against which the tip of tool 52 has been disposed. Particularly if the tool 52 is positioned relative to the horizontal axis of grinding wheel 14 so that there is substantially little vertical space therebetween, it will be seen that by reciprocating the chuck 10 in opposite directions as indicated by the arrows in Fig. 2, effective dressing of the front side of the grinding wheel, as viewed in Fig. 2, may be effected. Such reciprocation of the chuck 10 is accomplished by conventional mechanism within the grinding machine of which the chuck 10 is a part and in which the chuck is reciprocable upon guideways by suitable linkage or otherwise. The chuck 10 normally hold work pieces to be ground by wheel 14 as the pieces are reciprocably moved by the chuck 10 relative to wheel 1.

Further, by suitable positioning of the base 20, arm 36, and tool head 48, the rear face of wheel 14 may be dressed by operations similar to those described above relative to the front side of said wheel.

In addition, when it is desired to dress the curved face of the wheel 14, as shown in Fig. 4, particularly if it is desired not to disturb the vertical position of wheel 14 from the chuck 10, it may be that it is preferable to use the flat face 22 of base member 20 so as to dispose the axis of bearing means 30 and 38 as close as possible to the upper surface of chuck 10. Then, by positioning the arm 36 and head 48 otherwise as indicated in Fig. 4 relative to grinding wheel 14, said curved face of the wheel readily may be ground particularly by not only rotating wheel 14 but also moving it axially of arbor 16, whereby the entire width of the curved face may be dressed.

From the foregoing, it will be seen that an extremely simple yet highly effective grinding wheel dressing device is provided which operates upon the basic principle of permitting the dressing tool to be moved to the grinding wheel whenever possible rather than vice versa, thereby permitting a given setting of a grinding wheel relative to a work piece on the grinding machine being maintained, yet making it possible for the wheel to be dressed in the midst of a grinding operation. Several supporting surfaces are formed upon the base member of the dressing device and a simple but accurate mounting means for a tool supporting arm permit a wide range of adjustment of said arm and a tool holder carried in the outer end thereof relative to a grinding wheel. Suitable means also are provided for maintaining the various elements in all desired positions to which said elements have adjustably been moved. Further, the dressing device is relatively light in weight, compact and small in size so as to require little storage space, and inexpensive to produce. Also, as seen from Fig. 2 particularly, the entire dressing device 12, though narrow, is balanced laterally as viewed in said frame as a result of arm 36 being disposed intermediately of the surfaces 22 and 24 in a transverse direction.

It will also be seen from Figs. 1 and 4 that a further advantage is afforded by the dressing device relative to balance. Due to the fact that the axis of bearing means 30 and 38 is relatively close to flat surface 24 and even closer to flat surface 22 than to the opposite edge of base member 20 to which the numeral 12 points in Fig. 1, there is no tendency for the device 12 to tip regardless of the position in which arm 36 is disposed relative to slot 32 or the flat surface 22 or 24 upon which the device is resting upon a grinding machine. Hence, due to the

position of aperture 30 relative to flat surfaces 22 and 24, the device is not top-heavy in any intended position of arm 36 even when resting upon the chuck 10 or while being positioned thereon relative to grinding wheel 14, regardless of whether the magnets of the chuck are energized or not.

While the invention has been shown and illustrated in its preferred embodiment, and has included certain details it should be understood that the invention is not to be limited to the precise details herein illustrated and described since the same may be carried out in other ways falling within the scope of the invention as claimed.

I claim:

1. A device for dressing the grinding wheel of a grinding machine and comprising in combination, a base member having a flat surface thereon extending transversely to the main plane of said member and arranged to be disposed upon a supporting surface of a grinding machine such as the face of a magnetic chuck thereon, whereby said base member extends vertically from said supporting surface, said base member having bearing means extending parallel to said flat surface and positioned nearer one end of said flat surface than the other and said base member also having an arcuate slot therein comprising a segment of a circle described about the axis of said bearing means, an arm pivotally supported at one end by said bearing means and provided with clamping means intermediately of the ends of said arm and extending through said slot and operable to clamp said arm adjustably in desired angular positions relative to the axis of said bearing means between a position extending toward said other end of said flat surface and a position substantially vertical to said flat surface, a head rotatably supported by the other end of said arm for movement about an axis parallel to that of said bearing means, said head having means to hold a dressing tool, and means operable to lock said head in any desired position of adjustment about the axis thereof to support a dressing tool as desired relative to any surface of a grinding wheel to be dressed thereby.

2. A device for dressing the grinding wheel of a grinding machine and comprising in combination, a base member having a plurality of flat surfaces extending transversely to the main plane of said member along different edges thereof and at substantially 90° to each other,

said surfaces selectively being arranged to be disposed upon a supporting surface of a grinding machine such as the face of a magnetic chuck thereon, whereby said base member extends vertically from said supporting surface, said base member having bearing means extending transversely thereto at different distances from said flat surfaces, both of which distances are less than half the lengths of said flat surfaces, and an arcuate slot therein comprising a segment of a circle described about the axis of said bearing means, whereby said bearing means is positionable selectively at different distances from said supporting surface according to the selected flat surface of said member positioned against said supporting surface, an arm pivotally connected at one end to said bearing means and including clamping means extending through said slot and operable to clamp said arm adjustably in desired angular positions relative to said bearing means, a head rotatably supported by the other end of said arm for movement about an axis parallel to said bearing means and said supporting surface, said head having means to hold a dressing tool and means operable to lock said head in any desired position of adjustment about the axis thereof to support a dressing tool as desired relative to any surface of a grinding wheel to be dressed thereby.

3. The device according to claim 2 in which the length of said flat surfaces is substantially greater than the width thereof and said arm is positioned substantially centrally between the sides of said flat surfaces, thereby affording balance to said device when either of said flat surfaces of said base member are disposed upon a horizontal face of a magnetic chuck or the like.

4. The device according to claim 2 in which the arm is slidable against a flat planar surface adjacent said arcuate slot comprising a clamping surface perpendicular to said flat surfaces upon said base member, said clamping means holding said arm intermediately of the ends thereof firmly against said planar surface.

References Cited in the file of this patent

UNITED STATES PATENTS

1,999,435	Albertson	Apr. 30, 1935
2,406,467	Looney	Aug. 27, 1946
2,655,910	Grow	Oct. 20, 1953