Jan. 10, 1928. 1,655,903

W. J. GUILD ET AL.

ADJUSTABLE MOUNTING FOR GRINDING WHEEL DRESSING DEVICES

Filed Jan. 17, 1927 2 Sheets-Sheet 1

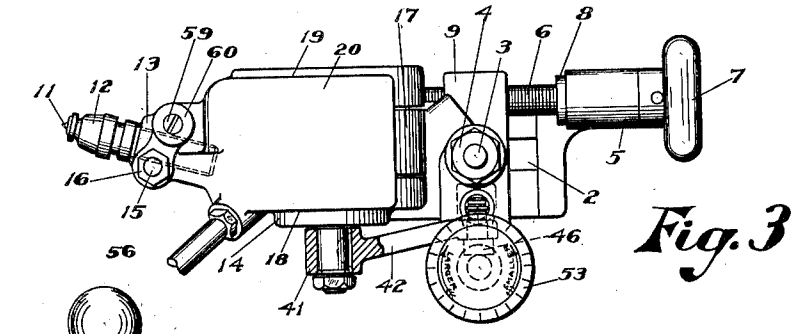


Fig. 3

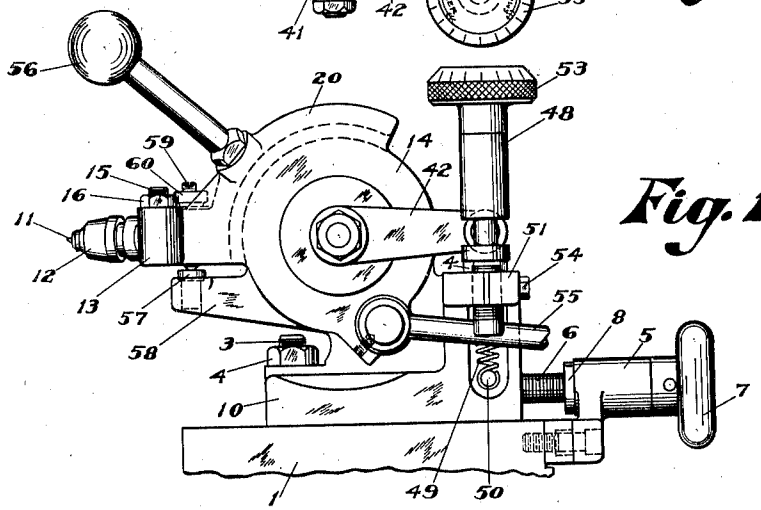


Fig. 1

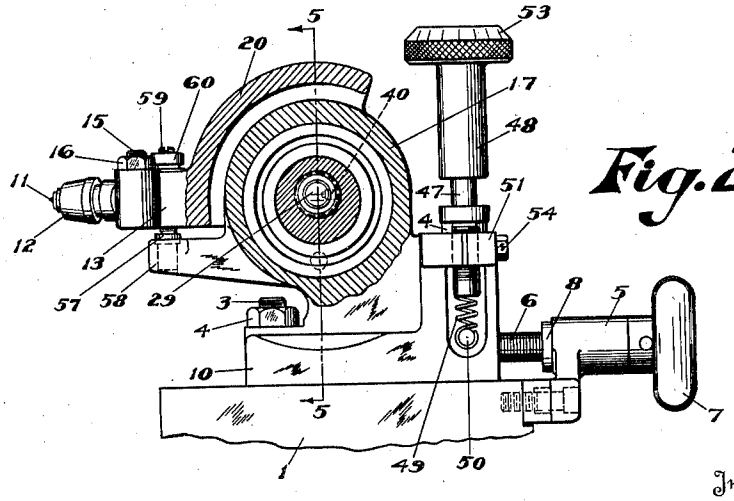


Fig. 2

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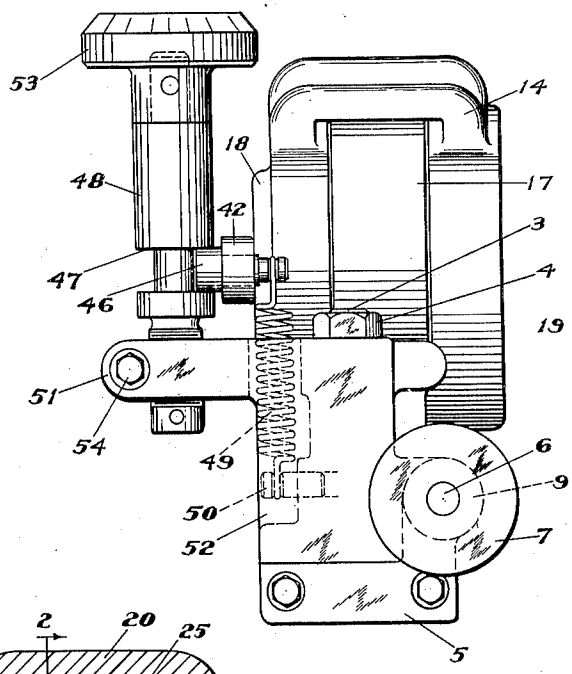
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Fig. 4



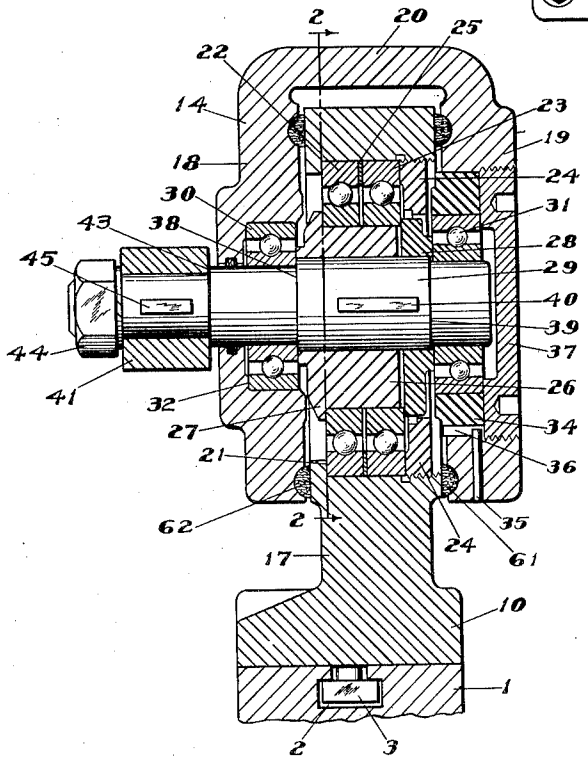


Fig. 5

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UNITED STATES PATENT OFFICE.

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ADJUSTABLE MOUNTING FOR GRINDING-WHEEL-DRESSING DEVICES.

Application filed January 17, 1927. Serial No. 161,625.

The present invention relates to dressing or truing devices, as used particularly for the abrasive wheels of grinding machines.

Such a dressing device usually consists of a diamond suitably held in a metal plug or nib, and the usual method of setting or adjusting the same in its standard or other support is to move the nib, which may be threaded for this purpose, in or out as desired, until the desired setting is secured, following which a binding nut or a set screw is utilized to hold the diamond firmly in place. This is a very haphazard method of adjustment, and in many cases results in the diamond being advanced too far towards the wheel, causing undue waste of the wheel when dressing occurs, and in some cases causing the diamond to be burned and thereby ruined.

According to the present invention, the dressing diamond can be advanced toward the wheel by definitely known and minute amounts, so that the operator is able to dress the wheel economically without fear of spoiling the diamond; this also gives the operator an exact knowledge of the amount of material removed from the wheel, in consequence of which he is able, by regulation of the feed of the wheel before resumption of grinding, to make sure that the depth of the next cut taken by the wheel will not be so great as to spoil the workpiece.

The invention is herein shown as applied to a diamond mounting which normally maintains the diamond out of the path of the wheel, but which is adapted for oscillation to dispose said diamond in said path, when it is desired to dress the wheel. The invention is embodied in an eccentric which is adapted to vary the position of the diamond carrying member by changing its center of oscillation. The angular position of this eccentric can be shifted by very small amounts, and the resultant lateral advance or retrogression of the pivot point for the oscillatory diamond carrying member can therefore be regulated to one-tenth of a thousandth of an inch or less.

The foregoing will more fully appear from the following description, taken in connection with the accompanying drawings, in which—

Fig. 1 is a side elevation of a device embodying the invention.

Fig. 2 is also a side elevation, but with certain parts shown in section, on the line 2—2 of Fig. 5.

Fig. 3 is a plan view.

Fig. 4 is a rear elevation.

Fig. 5 is a sectional view, the section being taken on the line 5—5 of Fig. 2.

Like reference characters refer to like parts in the different figures.

Referring to all the figures, the dressing apparatus is mounted, for example, on the frame 1 of a grinding machine. In order that the whole device may be moved towards and from the axis of rotation of a grinding wheel, the supporting means 1 provides a slot 2 into which extend the heads of T-bolts 3—3 provided with tightening nuts 4—4.

Desirably also, the support 1 has a journal member 5 attached thereto, which receives a screw shaft 6. The screw is held from longitudinal movement in the journal 5 by means of a knob or handle 7 on one side, and a collar 8 on the other. The screw 6 extends through a boss or lug 9 provided by the dresser stand 10; said boss or lug is internally threaded.

The foregoing simply constitutes means for readily moving the stand 10 so as to obtain approximately the correct position for the diamond 11; after this approximate adjustment is made, the nuts 4—4 should be tightened down on the bolts 3—3, (which pass through the stand 10), thus said stand is firmly fixed in position on the base 1.

The diamond 11 is embedded in a plug or nib 12 which is carried by a forward extension 13 of the oscillating member 14. A small headless bolt 15 is received in the extension 13, side of the shank of the plug 12; said bolt 15 has its cylindrical surface broken by a concave cut-out, and when it is drawn upwardly by a tightening nut 16, the plug 12, by the binding action, is firmly locked in position.

The stand 10 has an upwardly extending annular portion 17. Said annular portion 17 is surrounded by the oppositely extending annular sides 18 and 19 of the diamond carrying oscillatory member 14. Fig. 5 shows this relationship, and it will be seen that the sides 18 and 19 of the member 14 are connected by a bridge-like top portion 20.

Referring further to Fig. 5, the annular portion 17 has an inwardly extending shoul-

der 21 at one side thereof, while at the other side it is screw threaded. Otherwise its internal surface is cylindrical and serves to receive with a close fit the outer races of a pair of ball bearings 22 and 23. The left hand race, Fig. 5, bears against the shoulder 21, while the right hand race encounters a screw threaded ring 24, which thus, when tightened, hold the said outer races firmly in position in the annular portion 17. The outer races are slightly separated by an interposed ring 25.

The inner races of the ball bearings 22 and 23 fit on the external cylindrical surface of an eccentric member 26. The inner race of bearing 22 (which is the left hand inner race) abuts against a shoulder 27 formed on the eccentric member 26, while the race of bearing 23 (the right hand inner race) abuts a plate 28.

The member 26 has a cylindrical hole therein, the axis of which is not the axis of the outer cylindrical surface of said member, this being the reason it is termed eccentric. The plate 28 also has an eccentrically located hole. A short shaft 29 extends through the member 26 and the plate 28, being keyed to both and fitting tightly in the former; the shaft 29 is thus supported from the stand 10 by the ball bearings 22 and 23.

Shaft 29 supports the annular sides 18 and 19 of the oscillatory member 14 by means of ball bearings 30 and 31. The outer race of the former is received against the internal cylindrical surface of the side 18 and said race abuts laterally against a shoulder 32 provided by said side.

The outer race of the bearing 31 is received by a ring 34 which fits snugly in an internal cylindrical part of the side 19, said ring being desirably held from turning by a pin 35 carried by the portion 19 fitting in a slot 36 in ring 34, but the ring 34 is free to move axially. A plate 37 is screwed into the side 19, and this plate abuts the ring 34 and the outer race of bearing 31, but does not touch the inner race.

The inner races of bearings 30 and 31 fit snugly on the shaft 29 but are axially movable thereon. Shoulders 38 and 39 on the shaft 29 are desirably provided to keep said shaft in position, but it will be understood that there is a slight end play.

When the plate 37 is screwed inwardly, the several ball bearings described are tightened so that all play therein is eliminated as will now be explained. The plate 37, when screwed in forces the outer race of bearing 31 to the left, which eliminates play in said bearing and by the reaction of the balls forces the inner race to the left. This thrust in a left hand direction is transmitted next to the plate 28, thence to the inner race of bearing 23. Because of the interposed ring 25, the inner races of bearings 22 and 23 do not touch each other, so that the left hand thrust eliminates play from the bearing 23 whose outer race, as well as the outer race of bearing 22, is rigidly held in the annular member 17 as already described. The reacting force on the oscillatory member 14 produced by tightening the plate 37, produces a right hand thrust of the shoulder 32 against the outer race of bearing 30, eliminating play in said bearing and forcing its inner race to the right. The force is then transmitted to the member 26, whose shoulder 27 thrusts against the inner race of bearing 22. Thus play is eliminated from all the bearings.

The pivotal axis of the member 14 is the axis of shaft 29, but this axis can be moved by turning said shaft since the shaft axis is not in the center of the member 26, and since movement of the shaft 29 is always accompanied by movement of the member 26 on account of a key 40. The shaft 29 is turned as follows:—

Referring to Figs. 3 and 5, the hub 41 of an arm 42 is mounted on shaft 29 and held between a shoulder 43 on the shaft and a nut 44 on the end of the shaft, a key 45 being provided to compel the shaft to turn when the arm is moved.

As best shown in Fig. 4, the arm 42 is drilled at the outer end and a stud 46 is inserted in the hole. The head of the stud fits in a groove 47 formed in an upright shaft 48. The other end of stud 46 is grooved and a spring 49 looped around it. This spring is anchored at the bottom to a pin 50 provided by the stand 10.

The shaft 48 is screw threaded at the bottom and is received in the internally threaded split portion 51 of an upward extension 52 provided by the stand 10. The upper end of the shaft 48 has a knurled knob 53 fastened thereto, by which it may be turned. The knob 53 may be provided with index markings or numbers, if desired, or it may be provided with directions as shown in Fig. 3. A bolt 54 is provided to tighten the split portion 51 and so lock the shaft 48 when the desired position of adjustment is obtained.

The member 14 is adapted to be moved automatically by mechanism provided by the grinding machine by means of a link 55, (see Fig. 1 in which said link is shown as broken off) or manually by a handle 56. The vertical adjustment of the diamond 11 when it is in the operative position (as shown by all the figures) may be effected in the usual manner, as by a hardened stop piece 57 held by a forward extension 58 of the stand 10 which is engaged by an adjustable screw 59 carried by the forward extension 13. A nut 60 is provided to lock the screw 59 in position.

When it is desired to adjust the diamond 11 forward or backwards by a slight amount,

the knob 53 is turned. This raises or lowers the arm 42. There can be no lost motion between the shaft 48 and the arm 42, because the spring 49 always holds the head of stud 46 on the bottom of groove 47, and likewise the pressure of spring 49 prevents any play between the threads on shaft 48 and those in the split portion 51.

Raising or lowering the arm 42 changes the axial position of shaft 29, as has already been explained. Thus the position of diamond 11 will be changed when it is lowered as shown in the drawings. This adjustment does not in any way interfere with the oscillation of the member 14 to move the diamond 11 out of the path of the grinding wheel, since the member 14 is always movable on the shaft 29 by means of the ball bearings 30 and 31.

Referring again to Fig. 5, annular felt washers 61 and 62 may be provided to keep dirt out of the ball bearings.

We claim:

1. In apparatus of the class described, a pivotally mounted member, a second member pivotally mounted on said first member, the pivotal axis of the second member being slightly removed from the pivotal axis of the first member, and a dressing tool carried by one of said members, whereby movement of one pivotally mounted member oscillates said dressing tool, and movement of the other pivotally mounted member changes its axis of oscillation.

2. In apparatus of the class described, a pivotally mounted member, a second member pivotally mounted on said first member, the pivotal axis of the second member being slightly removed from the pivotal axis of the first member, a dressing tool carried by one of said members, whereby movement of one pivotally mounted member oscillates said dressing tool, and movement of the other pivotally mounted member changes its axis of oscillation, and screw means to turn the member that changes the axis of oscillation.

3. In apparatus of the class described, a set of antifriction bearings, a member pivotally mounted in said bearings, a second set of antifriction bearings carried by said pivotally mounted member, a second pivotally mounted member carried by said second set of bearings, and a dressing tool carried by one of said members.

4. In apparatus of the class described, a set of antifriction bearings, a member pivotally mounted in said bearings, a second set of antifriction bearings whose axis is eccentric to the axis of said first set of bearings, said second set of bearings being carried by said pivotally mounted member, a second pivotally mounted member carried by said second set of bearings, and a dressing tool carried by one of said members, whereby movement of one pivotally mounted member oscillates said dressing tool, and movement of the other pivotally mounted member changes its axis of oscillation.

5. In apparatus of the class described, a set of antifriction bearings, a member pivotally mounted in said bearings, a second set of antifriction bearings whose axis is eccentric to the axis of said first set of bearings, said second set of bearings being carried by said pivotally mounted member, a second pivotally mounted member carried by said second set of bearings, a dressing tool carried by one of said members, whereby movement of one pivotally mounted member oscillates said dressing tool, and movement of the other pivotally mounted member changes its axis of oscillation, and means for taking the play out of both of said sets of bearings.

6. In apparatus of the class described, a pivotally mounted member, a second member pivotally mounted on said first member, a bearing comprising the pivotal mounting for one of said members, the pivotal axes of both members being included within the contact portions of said bearing and the pivotal axis of the second member being slightly removed from the pivotal axis of the first member, and a dressing tool carried by one of said members, whereby movement of one pivotally mounted member oscillates said dressing tool, and movement of the other pivotally mounted member changes its axis of oscillation.

7. In apparatus of the class described, a pivotally mounted member, a second member pivotally mounted on said first member, a bearing comprising the pivotal mounting for one of said members, the pivotal axes of both members being included within the contact portions of said bearing and the pivotal axis of the second member being slightly removed from the pivotal axis of the first member, a dressing tool carried by one of said members, whereby movement of one pivotally mounted member oscillates said dressing tool, and movement of the other pivotally mounted member changes its axis of oscillation, and screw means to turn the member that changes the axis of oscillation.

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