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HOLDER FOR DIAMOND DRESSING TOOLS

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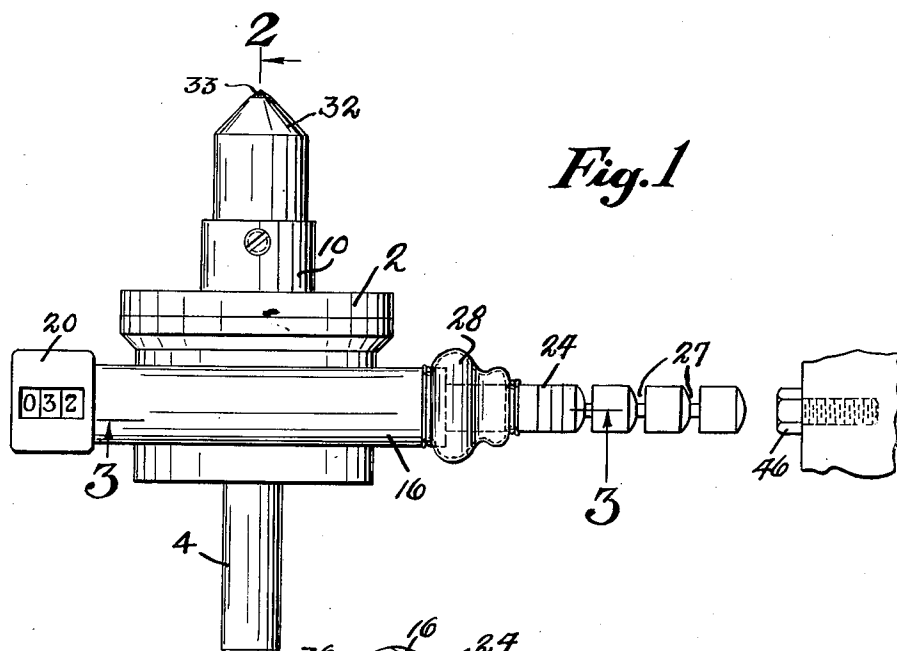


Fig. 1

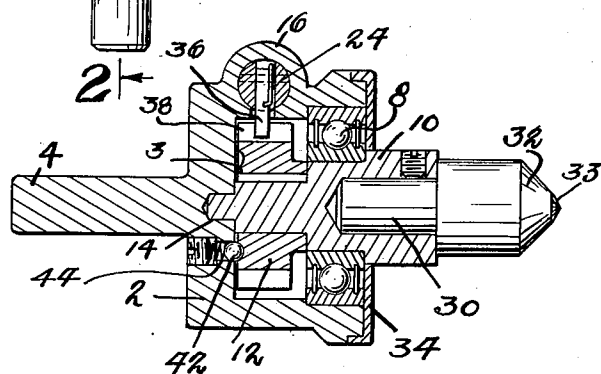


Fig. 2

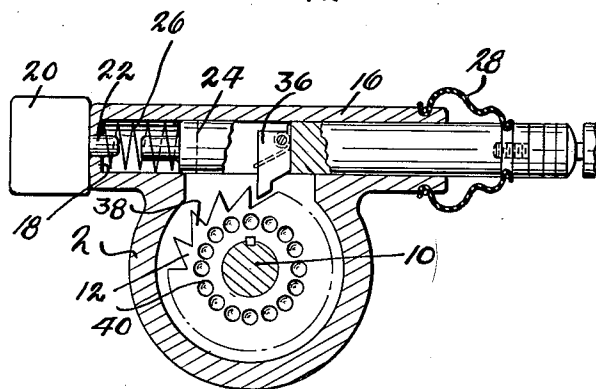


Fig. 3

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HOLDER FOR DIAMOND DRESSING TOOLS

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1 Claim. (Cl. 125—11)

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Our invention relates to an improvement in dressing tool holders, with particular reference to holders for dressing grinding wheels.

Grinding wheels consist of a very large number of cutting points cemented or bonded together and presented to the work at many different angles. Their action is to produce a large number of very fine cuts simultaneously. As these cuts are exceedingly small, being determined, of course, by the size of the particles of the abrasive of the wheel, accuracy in the work done by the wheel can only be attained by the greatest precision in the shaping of the wheel on its axis. This is effected by dressing which is the function of the dressing tool that is to be mounted in our improved holder.

It will be appreciated, therefore, that the dressing tool for best results must be treated as a precision instrument.

One of the objects of our invention is to provide a diamond dressing tool holder wherein the diamond tool will be positively indexed at regular intervals, as for example, after each traverse of the tool across the work. By providing for positive indexing of the tool we eliminate the human element and hence are assured that the tool in this respect will receive the proper attention.

This indexing of the tool, which involves a partial rotation of the tool at regular intervals, will avoid the formation of excessive flats upon the diamond of the tool from abrasive friction of the wheel being dressed; it also avoids diamond cracking which is of frequent occurrence in practice where the diamond is left in one position for repetition grinding or dressing.

A further object of our invention is to provide a holder for diamond dressing tools wherein the tool is positively indexed at regular intervals so as to maintain the stone in sharp condition so as to dress the wheel and remove the charge by a true cutting action. A dull diamond tool will not fracture the abrasive of the wheel being dressed and leave crystals above the bonding material of the wheel as they should be.

Some of the abrasive crystals of the wheel are merely weakened by the pressure of the diamond in the dressing operation if a dull diamond is used, and these crystals break while grinding and scratch the work.

A dull diamond may press the wheel cuttings into the bond of the grinding wheel and so give the effect of a loaded wheel, one of the conditions which dressing is designed to correct. This

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action often results in overheating and cracking of the diamond.

It will be appreciated from the foregoing that for best results it is of paramount importance that the diamond of the tool be kept sharp at all times.

A further object of our invention is to provide a tool holder which is not only compact and trouble-free but to provide a construction which is effectively sealed against the entry of dirt and grit and the coolants employed for cooling the diamond and wheel during the dressing operation. This avoids undue wear of the internal mechanism of the holder, so that we are assured the tool will be maintained rigid at all times, which is of importance in avoiding chattered work and ruined diamonds.

Another object of our invention is to provide a digit counter as a part of the holder, the counter being operated by the indexing mechanism. This enables an accurate count automatically to be kept of the number of wheel dressings per diamond, so that the actual cost per dressing may be determined readily and accurately.

In the accompanying drawings:

Fig. 1 is a top plan view of one embodiment of our invention;

Fig. 2 is a section on the line 2—2 of Fig. 1; and Fig. 3 is a section on the line 3—3 of Fig. 1.

Referring to the drawings in detail, 2 designates the housing of our improved device.

Preferably integral with the rear end wall of the housing 2 is the shank 4 for mounting our device in any standard machine tool holder.

Within the housing 2 at the forward end thereof is anti-friction bearing 8 for the tool mounting spindle 10.

The rear wall of the bearing 8 is spaced some distance from the inner face of the rear end wall 3 of the housing 2 to provide a space therebetween for the reception of indexing gear or ratchet 12 carried by the tool mounting spindle 10. This gear may be a press fit upon the spindle 10 or keyed thereto. It is essential that the two be rigidly attached to each other.

The tool mounting spindle 10 passes entirely through the indexing gear and its rear end has a bearing in the rear wall 3 of the housing 2 as seen in Fig. 2 at 14.

It will be understood that the fixture mounting shank 4 and the tool mounting spindle 10 are in axial alignment with each other.

At the top of the housing 2, either integral therewith or sealed thereto, is a plunger barrel or housing 16. This elongated housing is im-

diately above the indexing gear 12 and like the gear 12 is transverse of the housing 2.

One end of the plunger barrel or housing 16 is closed as seen at 18 and mounted at the exterior of this end of the housing is a counter 20. This counter, the details of which are not illustrated, may be any one of the standard counters available on the market.

The actuating plunger of the counter is designated 22 and, as will be seen, it extends through closed end 18 into the interior of the housing or barrel 16.

24 designates the indexing plunger of our device, this plunger being mounted within the plunger barrel 16. Between the inner end of this plunger and the closed end of the barrel 16 is spring 26 normally holding the plunger in its outermost or extended position.

The inner end of the indexing plunger 24 is adapted to engage the plunger 22 of the counter 20 each time the indexing plunger is actuated inwardly, thereby to operate the counter each time the tool is indexed.

The indexing plunger is extended for a substantial distance beyond its housing or plunger barrel 16, and is provided at intervals along its length with weakened areas 27 so that the plunger may be broken off at any of these areas desired to adapt the device for mounting on machines of varying dimensions.

As above pointed out, our device is sealed against the entry of dirt and moisture, and in this connection the plunger housing at the end from which the plunger 24 projects is provided with a sealing boot 28, one end of which is attached to the housing and the other end to the indexing plunger. This effectively seals the housing 16 against the entry of dirt and moisture past the plunger 24. The opposite end of the housing is closed.

The tool mounting spindle 10 at its forward end projects beyond the adjacent end of the housing 2 and is bored axially for the reception of the shank 30 of diamond dressing tool 32.

The housing 2 at this end thereof is sealed by sealing cap 34. The opposite end of this housing is closed.

The operative connection between the indexing gear 12 and the index operating plunger 24, comprises a spring-loaded pawl 36 which is set into the plunger 24 and projects therefrom so as to engage the ratchet teeth 38 of the gear 12.

The rear face of the indexing gear is provided with a series of depressions 40 equally spaced about the axis of the gear. These are locking depressions to hold the gear in indexed position, the depressions being engaged by spring loaded locking ball 42, mounted in a bore 44 provided for this purpose in the rear wall of the housing 2.

In the use of our improved mounting device the mounting shank 4 is simply inserted into the conventional tool holder of a grinding machine and locked therein in the usual way.

The tool holder of the grinding machine may be actuated manually or be power driven in accordance with conventional practice to carry the tool 32 with its diamond point 33 across the face of the wheel being dressed.

Mounted in any convenient location on the machine, but in the path of the indexing plunger 24 is a stop or actuator 46, which is preferably adjustable. Each time the tool has traversed the face of the wheel being dressed and returned to its initial position, the indexing plunger 24 will engage the stop 46 thereby to actuate the plunger

against the action of its spring 26 to index the tool for one tooth of the indexing gear or ratchet 38.

It will be apparent, therefore, that a fresh surface of the diamond 33 is presented to the wheel being dressed on each forward traverse of the diamond across the wheel face. It will be understood also that each time the indexing plunger 24 is actuated by engagement with the stop 46, the inner end of the plunger will strike the plunger 22 of the counter 20 so that the counter is actuated. In this way an accurate record is made of the number of wheel dressings per diamond so that the actual cost per dressing will be known.

From the foregoing it will be appreciated that we have provided a device or fixture for mounting a diamond dressing tool wherein the construction is such that in dressing a wheel the tool is indexed at regular intervals so as always to maintain the tool in sharp condition thereby to avoid damage to the wheel being dressed and/or to the diamond of the tool itself by attempting to dress the wheel with a dull tool.

It will be appreciated also that our fixture or tool mounting device is sealed against the entry of dirt and moisture. This is of importance in that the internal parts of the device are protected against undue wear due to the water and grit or abrasives always present in grinding wheel dressing operations.

It will be further appreciated that our device is automatic in operation so far as indexing the diamond tool is concerned, so that we are assured that the tool will always be indexed without relying upon the operator.

It is to be understood that changes may be made in the details of construction and arrangement of parts hereinabove described without departing from the spirit and scope of our invention.

What we claim is:

A mount for diamond dressing tools, said mount comprising, in combination, a housing; a tool-mounting spindle extending thereinto; an anti-friction bearing within the housing in which the outer end of the spindle is journaled and through which the spindle extends; a bearing in the inner face of the rear wall of the housing in which the rear end of said spindle is journaled; an indexing gear rigidly mounted on said spindle intermediate said bearings; a longitudinally movable indexing plunger extending into said housing and projecting to the exterior thereof; said plunger extending transversely to the axis of said spindle; an indexing pawl pivotally affixed to said plunger and extending into engagement with the teeth of said indexing gear, to index said spindle upon actuation of said plunger; a device for recording each actuation of the said plunger, said recording device being carried by said housing; a plunger for actuating said recording device, said plunger being carried within said housing and being actuated by the indexing plunger each time the latter is actuated; depressions in one face of said indexing gear; a spring-loaded locking ball within the housing, adapted to engage one of said depressions after each actuation of the indexing plunger to lock the indexing gear in indexed position; a sealing cap for sealing the housing at the front end thereof about the tool-mounting spindle; and a sealing boot surrounding the projecting portion of the indexing plunger, one end of the boot being

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secured to the plunger and the other end being secured to the housing.

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