April 10, 1956 H. S. NAGODE 2,741,239

ROTARY DIAMOND TOOL

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Fig. 1

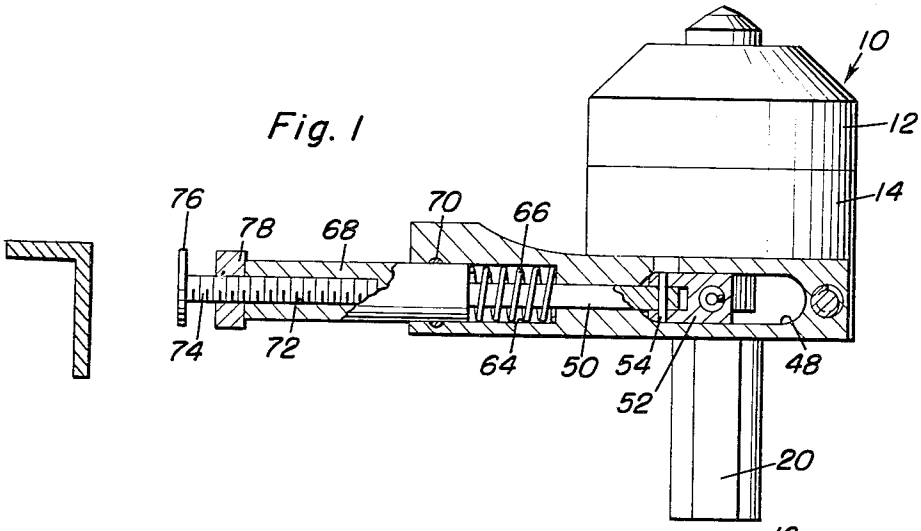
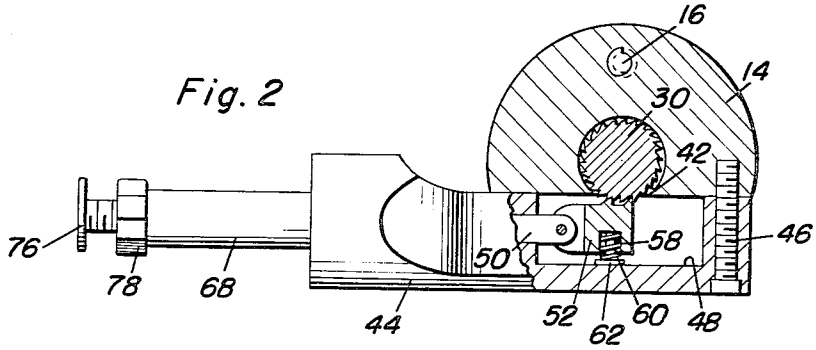


Fig. 2



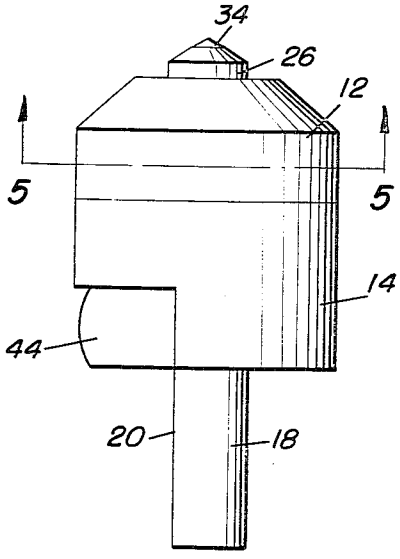


Fig. 3

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ROTARY DIAMOND TOOL

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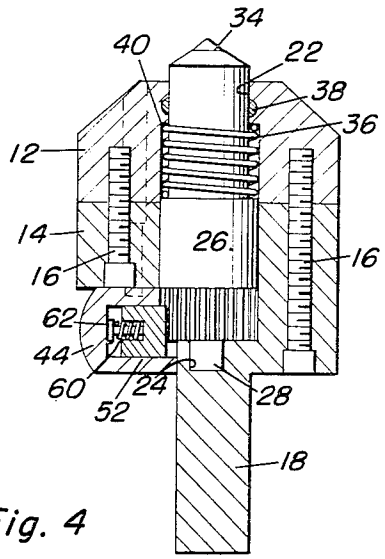
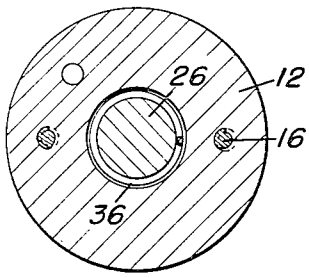


Fig. 4

Fig. 5



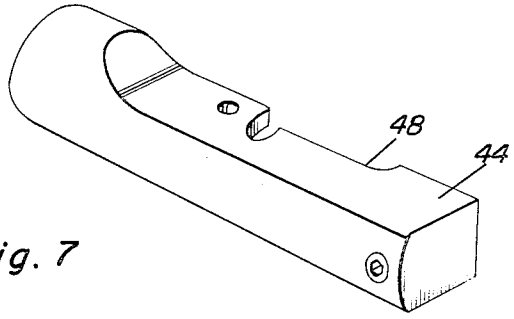


Fig. 7

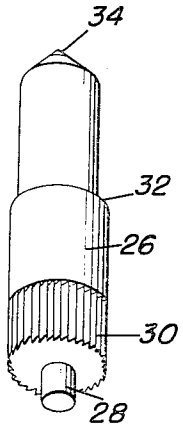


Fig. 6

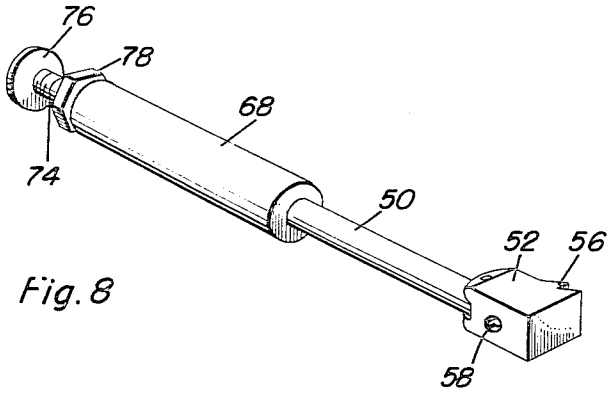


Fig. 8

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United States Patent Office

2,741,239

Patented Apr. 10, 1956

2,741,239

ROTARY DIAMOND TOOL

Henry S. Nagode, Buena Park, Calif., assignor of twenty-five per cent to Donald D. Dixon and twenty-five per cent to Stephen F. Gallagher, both of Anaheim, Calif.

Application September 22, 1953, Serial No. 381,689

3 Claims. (Cl. 125—11)

This invention relates to a rotary diamond tool and more specifically provides a tool for dressing abrasive grinding wheels.

An object of this invention is to provide a rotary diamond tool that will automatically rotate through a part of a revolution each time it travels across the face of a grinding wheel.

Another object of this invention is to provide a rotary diamond tool having an improved sealing structure for excluding abrasive dust from the interior of the diamond tool.

A further object of this invention is to provide a rotary diamond tool which has a positive indexing means for the diamond tool which will avoid the formation of flat portions upon the diamond due to the action of the abrasive friction of the wheel being dressed.

Another object of this invention is to provide a rotary diamond tool which prevents a diamond from cracking and chipping often occurring in repeated dressing.

A still further object of this invention is to provide a rotary diamond tool which is accurate, easy to operate, positive in action and inexpensive to manufacture.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a side elevation of the rotary diamond tool of this invention with portions of the operating shaft broken away;

Figure 2 is a top plan view with portions broken away showing the interengaging ratchet gear and spring urged pawl;

Figure 3 is an end view of the diamond tool of this invention looking at the right hand end of the device of Figure 1;

Figure 4 is a transverse, vertical section taken substantially along thte center line of the device of Figure 3;

Figure 5 is a transverse, top plan section taken substantially along section line 5—5 of Figure 3 showing details of the friction spring;

Figure 6 is a perspective detail of the diamond mounting shaft;

Figure 7 is a perspective detail view of the operating shaft housing; and

Figure 8 is a perspective detail view of the operating shaft.

Referring now specifically to the drawings, it will be seen that the numeral **10** generally designates the rotary diamond tool of this invention including an upper housing member **12** and a lower housing member **14** joined together by recessed screws **16** and provided with a projecting stud **18** on the lower housing **14** for securing the diamond tool **10** in a suitable carrier with the flat portion **20** of the stud **18** providing a locating and keying

means for the diamond tool **10** in a truing attachment of a grinder.

As best seen in Figure 4, the housings **12** and **14** are provided with an elongated bore **22** with the bore ending in a counterbore **24** in the bottom portion of the lower housing **14**. A diamond mounting shaft **26** is rotatably received in the bore **22** with a projecting bearing portion **28** received in the counter-bore **24**. The shaft **26** is provided with a ratchet gear **30** adjacent its lower end with the bearing portion **28** projecting therefrom. The center portion of the shaft **26** is in the nature of a frictional bearing surface and a shoulder **32** is provided adjacent the midportion of the shaft **26** and a diamond **34** is mounted on the outer tapered end of the shaft **26**. In the assembling of the diamond tool **10**, the lower housing member **14** is assembled with the shaft **26** and a coil spring **36** is placed around the upper portion of the shaft **26** with the lower end of the spring **36** engaging the shoulder **32**. The upper housing **12** having an O ring seal **38** in the bore **22** is placed over the lower housing **14** and the upper end of the spring **36** engages a shoulder **40** in the housing **12** thereby maintaining the shaft **26** in frictional engagement with the housings **12** and **14**. The recess screws **16** are then tightened bringing the matching faces of the upper housing member **12** and the lower housing member **14** into contact for sealing the upper portion of the diamond tool **10**. The lower portion of the lower housing **14** is provided with a cutaway portion providing an entrance **42** to the ratchet gear **30**. An operating shaft housing **44** is secured to the cutaway portion by a suitable recessed screw **46** and the lower surface of the operating shaft housing **44** is flush with the lower surface of the lower housing member **14** thereby providing an even seat for the tool mounting member **10**. The operating shaft housing **44** is provided with a recessed portion **48** having an entrance opening facing the opening **42** and in alignment therewith thereby providing access to the ratchet gear **30**. An operating tripper shaft **50** is slidably mounted in the housing **44** and a pawl **52** is pivoted to the end of the shaft **50** by a vertical pivot pin **54**. The pawl **52** is provided with ratchet teeth **56** for matching engagement with the ratchet gear **30** and the rear portion of the pawl **52** is provided with a bore **58** for receiving a coil spring **60** and a guide therefor wherein the pawl **52** is urged about the pivot pin **54** into engagement with the ratchet gear **30**. The housing **44** is provided adjacent its outer end with a bore **64** for receiving a coil spring **66** surrounding the operating shaft **50** and engaging the inner portion of the bore **64**. The shaft **66** is provided with an enlarged portion **68** slidably received in the bore **64** and abutting the other end of a compression spring **66** and an O ring **70** is provided adjacent the outer end of the bore **64** for sealing the enlarged portion of this shaft against entry of abrasive dust into the interior of the housing. The enlarged portion **68** of the shaft **50** is provided with an internally threaded bore **72** for receiving a threaded member **74** having an abutment head **76** on its outer end and a lock nut **78** is provided on said screw threaded member **74** for locking the abutment head **76** in relation to the enlarged portion **68** of the shaft **50** thereby adjusting the effective length of the shaft **50**. The juncture between the operating shaft housing **44** and the lower housing member **14** is provided with a suitable sealing compound thereby excluding dust from the interior of the rotary diamond tool **10** and the O rings **38**, **70** and the sealing compound completely seal the interior of the rotary diamond tool thereby providing an accurate and long wearing device.

The operation of the device will be readily understood. With the rotary diamond tool mounted on a suitable truing attachment by the use of the stud **18**, the diamond

34 is brought into contact with the grinding wheel to be dressed and the particular amount of the wheel to be dressed off is set and the device set in operative motion. After the diamond 34 travels across the face of the grinding wheel, the abutment stop 76 engages a stationary part of the grinder thereby actuating the rod 50 a predetermined amount and rotating the gear 30 one twenty-fifth of a turn. This partial rotation in turn rotates the diamond 34 to properly position the diamond for its second dressing operation. The ratchet gear 30 is provided with a total of 25 teeth and upon each actuation of the operating shaft 50 the shaft 26 is rotated one twenty-fifth of a revolution or slightly more than 14 degrees. The spring 66 automatically returns the shaft to its normal position wherein the pawl 52 is again engaged with another tooth of the ratchet gear 30 and ready for its next dressing operation. It will be noted that the compression spring 36 around the shaft 26 precludes any rotation of the shaft 26 under the influence of the grinding wheel and thereby maintains the device in accurate relation to the grinding wheel. The O ring seal 38 in the upper housing 12 provides a resilient positioning means for the shaft 26 as well as providing a seal for the housing. By removal of the recess screws 16 and 46 the device may be disassembled for cleaning and repair as may become necessary during operation. Obviously, this device may be used in conjunction with centerless grinders or cylindrical grinders with equal facility and accuracy of operation. The particular material used in the construction of this device may be chosen from any number of suitable materials known in the industry and meeting the requirements of this device.

From the foregoing, the construction and operation of the device will be readily understood and further explanation is believed to be unnecessary. However, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the appended claims.

What is claimed as new is as follows:

1. A rotary diamond tool comprising a housing, a spindle journaled in said housing, a diamond mounted on said spindle, a ratchet gear integral with said spindle and disposed in said housing, a spring biased pawl slidably and pivotally mounted on said housing and engaging said ratchet gear, means for reciprocating said pawl for rotation of said gear and spindle, and an O-ring seal and a coil spring cushioning means encircling said spindle for absorbing vibrations induced as the diamond engages the rotating work, said housing constructed of a plurality of detachable sections, said coil spring resiliently retaining the spindle against longitudinal movement, said pawl actuation means including a tripper shaft assembly having a casing with a slot facing said ratchet gear, said pawl pivotally mounted on one end of said tripper shaft and a coil spring disposed between the rear surface of said pawl and the casing, the other end of said shaft including an abutment for reciprocation of said shaft and spring means to return said shaft to its extended position.

2. A rotary diamond tool comprising a housing, a spindle journaled in said housing, a diamond mounted on said spindle, a ratchet gear integral with said spindle and disposed in said housing, a spring biased pawl slidably and pivotally mounted on said housing and engaging said ratchet gear, means for reciprocating said pawl for rotation of said gear and spindle, and an O-ring seal and a coil spring cushioning means encircling said spindle for absorbing vibrations induced as the diamond engages the rotating work, said housing constructed of a plurality of detachable sections, said coil spring resiliently retaining the spindle against longitudinal movement, said pawl actuation means including a tripper shaft assembly having a casing with a slot facing said ratchet gear, said pawl pivotally mounted on one end of said tripper shaft and a coil spring disposed between the rear surface of said pawl and the casing, the other end of said shaft including an abutment for reciprocation of said shaft and spring means to return said shaft to its extended position, said abutment on said tripper shaft is adjustable for varying the length of stroke of the pawl for adjusting and the degree of rotation of said diamond holding spindle.

3. A rotary diamond tool comprising a housing, a spindle journaled in said housing, a diamond mounted on said spindle, a ratchet gear integral with said spindle and disposed in said housing, a spring biased pawl slidably and pivotally mounted on said housing and engaging said ratchet gear, means for reciprocating said pawl for rotation of said gear and spindle, and an O-ring seal and a coil spring cushioning means encircling said spindle for absorbing vibrations induced as the diamond engages the rotating work, said housing constructed of a plurality of detachable sections, said coil spring resiliently retaining the spindle against longitudinal movement, said pawl actuation means including a tripper shaft assembly having a casing with a slot facing said ratchet gear, said pawl pivotally mounted on one end of said tripper shaft and a coil spring disposed between the rear surface of said pawl and the casing, the other end of said shaft including an abutment for reciprocation of said shaft and spring means to return said shaft to its extended position and, a sealing compound disposed between said housing and said casing for preventing the entrance of abrasive dust into the interior of said housing and casing.

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