

Oct. 30, 1945.

P. WEYNAND

2,387,787

VALVE SEAT GRINDING TOOL

Filed May 9, 1944

2 Sheets-Sheet 1

Fig. 1.

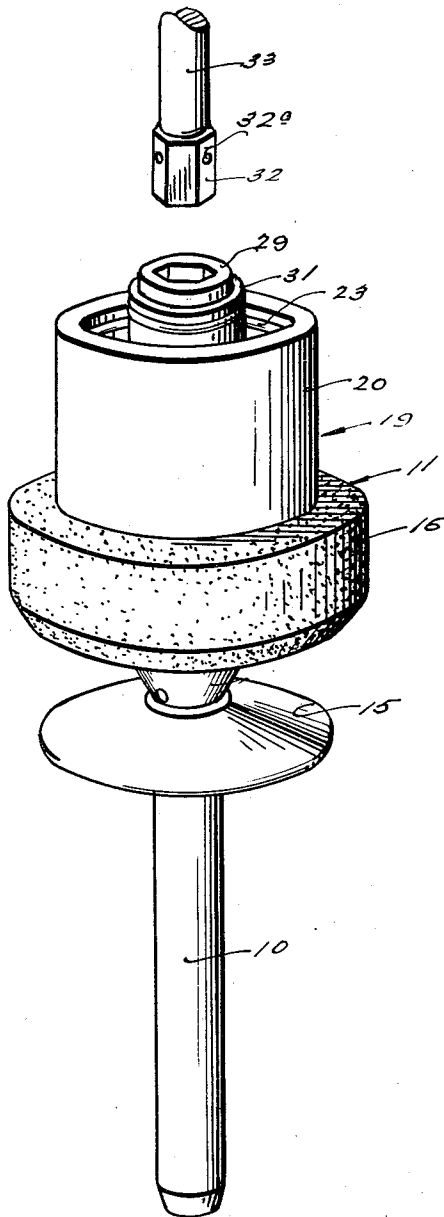


Fig. 2.

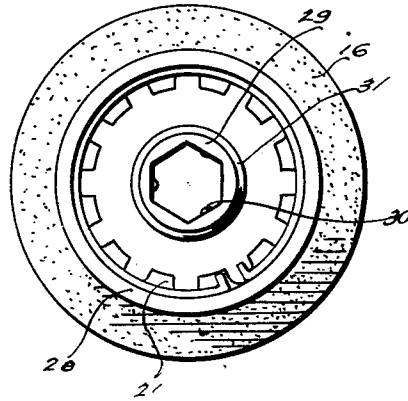
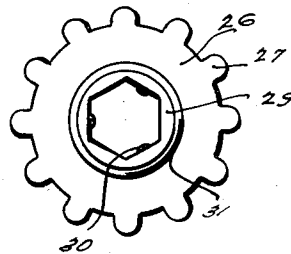


Fig. 3.



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2 Sheets-Sheet 2

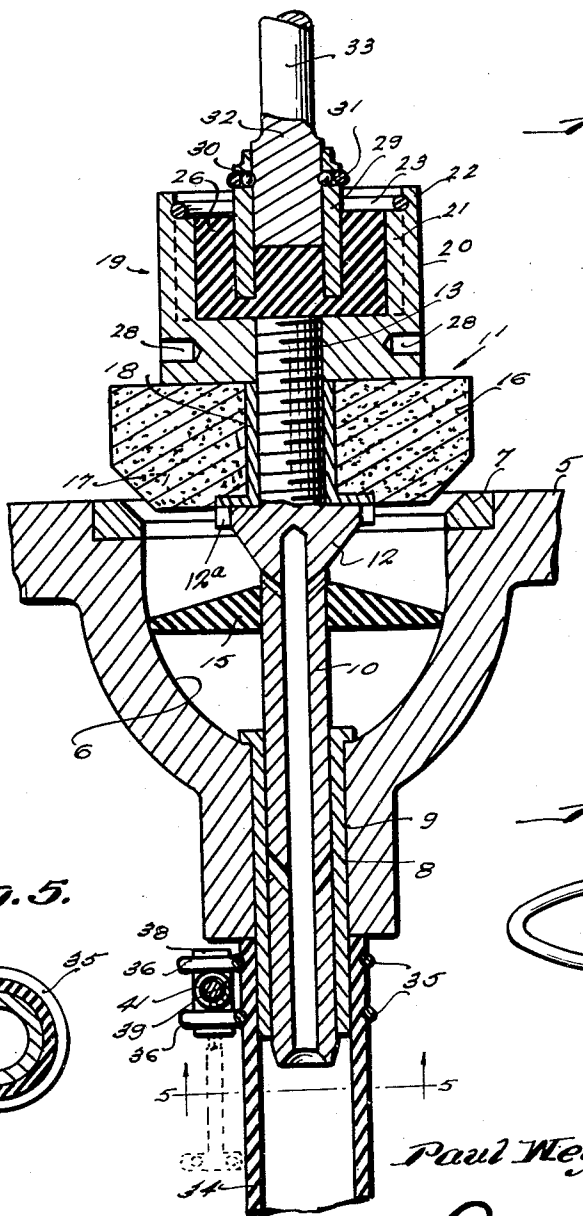


Fig. 4.

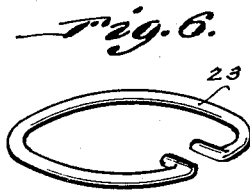


Fig. 6.

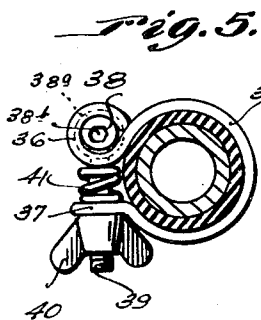


Fig. 5.

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UNITED STATES PATENT OFFICE

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VALVE SEAT GRINDING TOOL

Paul Weynand, San Antonio, Tex.

Application May 9, 1944, Serial No. 534,770

3 Claims. (Cl. 51-241)

This invention relates to new and useful improvements in grinding tools especially adapted for grinding the valve seats of airplane engines, the same being an improvement on my co-pending application Serial No. 502,513, filed September 15, 1943.

An important object of the present invention is to provide a valve seat grinding tool embodying means for washing away the grindings as the operation of grinding is performed.

Another important object of the invention is to provide a grinding tool of the character stated which because of its special construction permits accurate and true grinding of valve seats under practically all conditions.

Other objects and advantages of the invention will become apparent to the reader of the following description.

In the drawings:

Figure 1 represents a perspective view showing the turning handle separated from the tool proper.

Figure 2 is a top plan view of the tool proper.

Figure 3 is a top plan view of the resilient insert.

Figure 4 is a fragmentary longitudinal sectional view through the assembly.

Figure 5 is a cross sectional view taken substantially on the line 5-5 of Figure 4.

Figure 6 is a perspective view of the resilient insert retainer.

Referring to the drawings wherein like numerals designate like parts, it can be seen that numeral 5 denotes an engine block having a valve well 6 therein and at the outer portion of which is a conventional valve seat 7.

Numerals 8 and 9 denote a sleeve which is disposed through the usual bore 9 and through this sleeve is slidably and rotatably disposed a hollow shaft 10 which forms part of the grinding tool 11.

At the upper portion of the shaft 10, as shown in Figure 4, a circumferential flange 12 is provided, the shaft above this flange being threaded as at 13, while below this flange the shaft is formed with water outlet openings 14 upwardly inclined (see Figure 4) for directing water in fine streams against the valve seat 7. The flange 12 has spanner wrench receiving notches 12a at 90° intervals.

A resilient disk 15 is provided on the shaft below the openings 14 to serve as a baffle in deflecting water upwardly and to prevent grindings from getting between the pilot 10 and sleeve 8.

Numerals 16 and 17 denote a disk stone of emery or any suitable abrasive material the same having a

beveled face 17 for working engagement with the beveled face of the valve seat to be ground. The stone 16 has a hub or axial bushing 18 receiving the upper portion of the shaft 10.

A flexible coupling 19 is attached to the upper end of the shaft 10 and this consists of a cup 20 having vertical ribs 21 at its inner side extending from the bottom of the cup upwardly to terminate below the top of the cup. Just below the top of the cup, the side wall of the cup is formed with an inside circumferential groove 22 for receiving a split spring ring 23 having inturned end portions 24 which are used to insert ring 23 into cup 20.

The purpose of the spring ring 23 is to retain in place a resilient insert 25 which is fluted or provided with vertical ribs 27 for interlapped relation with the ribs 21 on the inside of the cup 20.

To accommodate a spanner wrench, recesses 28 may be formed in the lower portion of the cup 20 (see Figure 4).

A socket structure 29 of polygonal shape has its lower portion suitably embedded in the resilient insert 26, the upper portion being formed with a plurality of ball-receiving recesses containing balls 30 which are held in place by a spring ring 31 which is disposed around the upper portion of the socket structure 29 and located in a suitable groove formed in the socket structure.

Obviously, the socket structure 29 is intended to receive the polygonal-shaped head portion 32 of a suitable operating member 33. Obviously, this element 33 may be the shaft of a motor driven unit, should it be desired to operate the grinder by an electric motor. Recesses in the head 32 receive the balls 30.

A water supply hose 34 has its discharge end disposed over the lower end of the sleeve 8 and is held in this position by a clamp consisting of a pair of wire members 35 of substantially circular shape, each having loops 36 at one end and an eye 37 at its opposite end. The eyes 36 and 37 are disposed around an eccentric cylinder 38 and around the cylinder 38 is a band 38a from which projects a threaded shank 39 on which is a wing nut 40. Interposed between the loops 36 and the loop 37 is a compression spring 41.

The cylinder 38 has an Allen wrench receiving socket 38b, or a socket of some other form and capable of receiving a wrench to permit rotation of the cam cylinder 38.

Obviously, after the wing nut 40 has been tightened to firmly clamp the hose 34 to the lower end of the sleeve 8, a final tightening can be ob-

tained by rotating the cam cylinder 38 to draw the threaded member 39.

It can now be seen, that the stone 16 is rotated by the member 33 and the shaft 10 serving as a pilot will hold the stone 16 true, although there may be some variance in the plane of operation of the member 33, and as is apparent, this variance is taken care of by the resilient coupling 19. Water sprays from the ports 14 and each time the stone 16 is lifted slightly, water will wash away the grindings and further will maintain the surface being ground cool.

The stone 16 is secured to the pilot 10 and with allied parts forms an intact assembly, to the end that this assembly can be placed on a refacing machine where the stone is refaced. The valve is then refaced in the same valve machine, automatically securing the same angle on both the valve and seat.

While the foregoing specification sets forth the invention in specific terms, it is to be understood that numerous changes in the shape, size and materials may be resorted to without departing from the spirit and scope of the invention as claimed hereinafter.

Having described the invention, what is claimed as new is:

1. A valve grinder comprising a shaft, a grinding stone on the shaft, a member for rotating the shaft and shaft, a resilient coupling between

the stone and the rotating member, said shaft serving as a pilot, said shaft having a portion of hollow construction, said shaft having ports extending from the interior of the hollow portion of the shaft outwardly adjacent the stone for washing grindings produced by the stone on work.

2. A valve grinder comprising a shaft, a grinding stone on the shaft, a member for rotating the stone and shaft, a resilient coupling between the stone and the rotating member, said shaft serving as a pilot, said shaft having a portion of hollow construction, said shaft having ports extending from the interior of the hollow portion of the shaft outwardly adjacent the stone for washing grindings produced by the stone on work, and a baffle on the shaft for directing water discharging from the ports toward the work.

3. A valve grinder comprising a shaft, a grinding stone on the shaft, a member for rotating the stone and shaft, a resilient coupling between the stone and the rotating member, said shaft serving as a pilot, said shaft having a portion of hollow construction, said shaft having ports extending from the interior of the hollow portion of the shaft outwardly adjacent the stone for washing grindings produced by the stone on work, and a water conduit associated with the outer end of the shaft for supplying water to the hollow portion of the shaft for discharge through the ports.

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