June 28, 1949. W. J. PAPCIAK 2,474,756

HONING TOOL FOR EXTERNAL CYLINDRICAL SURFACES

Filed Nov. 19, 1946

Fig. 1.

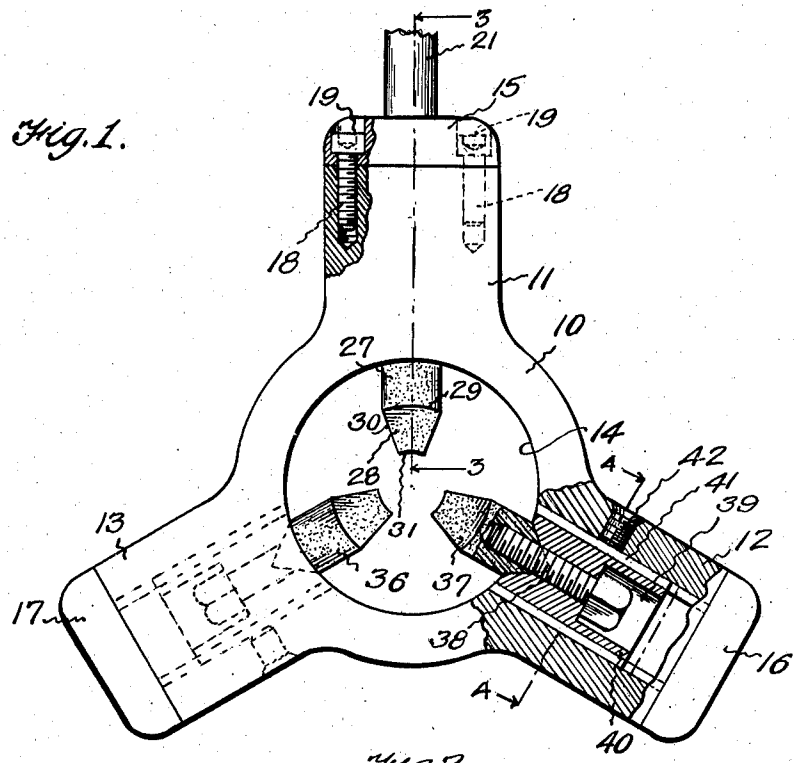


Fig. 2.

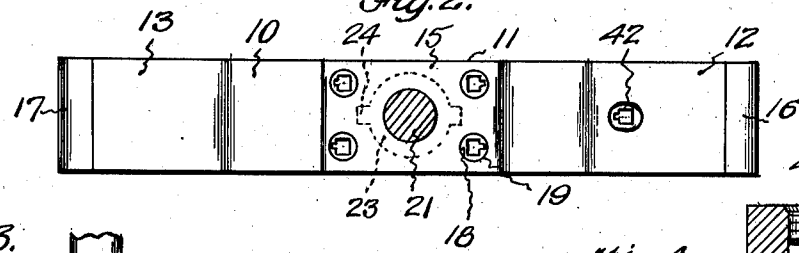


Fig. 3.

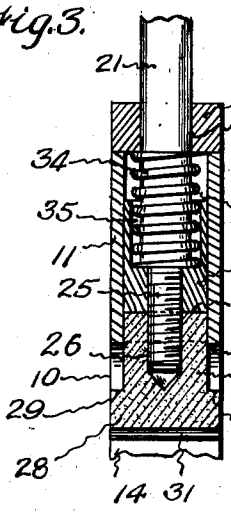


Fig. 5.

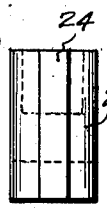


Fig. 6.

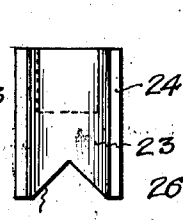


Fig. 4.

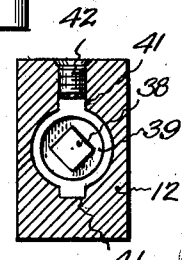


Fig. 7.

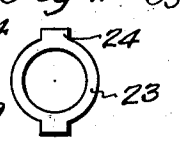


Fig. 8.

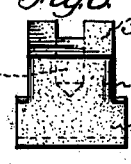
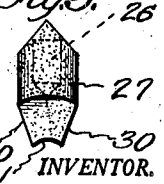


Fig. 9.



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HONING TOOL FOR EXTERNAL CYLINDRICAL SURFACES

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3 Claims. (Cl. 51—205)

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This invention relates to an outside diameter honing machine, and has for one of its objects the production of a simple and efficient means for reducing or removing irregularities upon cylindrical surfaces, and for bringing the cylindrical work to a correct size and also to highly polish the surface.

A further object of this invention is the production of an efficient honing mechanism which will provide a range of sizes within one shop, so that any outside honing job within a given range such as .125 to 3.00 may be handled without the necessity of providing extra individual honers.

Other objects and advantages of the present invention will appear throughout the following specification and claims.

In the drawing:

Figure 1 is a plan view of the outside diameter honing machine assembly, certain parts being shown in section;

Figure 2 is a side or edge view thereof, the supporting member being shown in transverse section;

Figure 3 is a sectional view taken on line 3—3 of Figure 1;

Figure 4 is a sectional view taken on line 4—4 of Figure 1;

Figure 5 is a side elevational view of one of the insert sleeves;

Figure 6 is a side elevational view of one of the insert sleeves looking at right-angles to that shown in Figure 5;

Figure 7 is a top plan view of the sleeve shown in Figure 5;

Figure 8 is a side elevational view of one of the inserts;

Figure 9 is a side elevational view of one of the inserts looking at right-angles to that shown in Figure 8.

By referring to the drawing, it will be seen that 10 designates the body or holder for the honing members. The body 10 is provided with three radiating legs 11, 12 and 13, and a central aperture 14. The legs 11, 12 and 13 carry caps 15, 16 and 17, respectively, at their outer ends, which caps are anchored in position upon the outer ends by means of anchoring screws such as are indicated at 18 in Figure 1 with respect to leg 11. The heads of these screws are preferably countersunk, as at 19. Each cap is anchored in position in a similar manner. The cap 15 is apertured, as at 20, and the support or handle 21 extends therethrough, as shown in Figure 3.

The radial leg 11 of the tool is provided, as is shown in Fig. 3, with a central socket 22 which

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extends from its outer extremity to open into the central aperture 14 of the tool body 10. A sleeve-like member 23 is slidably inserted into the socket 22 and is retained from rotation therein by longitudinal keys 24 which engage key-ways in the socket 22 in a conventional manner. The lower portion of the sleeve member 23 is reduced in diameter to form a central threaded aperture therein through which a threaded extension 25 of the handle 21 is passed to extend beyond the bottom of the sleeve. A tool insert 27, provided with a threaded socket 26 in one end, is slidably inserted into the lower end of the socket 22 so that the threaded socket 26 receives the extended threaded end of the handle extension 25. The lower end of the sleeve member 23 is provided with a tapered socket 33, while the inserted end of the tool insert is provided with a tapered tongue 32 which fits snugly into the sleeve socket 33 when the threaded extension 25 is rotated to draw the insert up flush with the sleeve. The lower extremity of the tool insert is provided with an enlarged outer end thereby forming shoulders 29 which act as abutments to engage the periphery of the central aperture 14 and limit the inward movement of the insert 27. The sides of the insert 27, at that portion thereof adjacent the outer extremity of the insert, converge, as at 30, to define a concave or straight honing, or lapping, face 31. To complete this assembly a coil spring 34 is carried about the handle 21 and seats between the sleeve shoulder formed at its point of reduced diameter and the inner face of the cap 15. Thus by the means of the structure defined, the insert tool 27 is yieldably supported within and without the tool leg 11.

The inserts or tools 36 and 37 may also be yieldably mounted in a similar manner, if desired, but it is preferable in many instances to support the inserts or tools 36 and 37 in a set adjusted position and merely support the insert or tool 27 in a yieldable manner. The inserts or tools 36 and 37 are preferably held in a set adjusted position by means of the structure shown in Figures 1 and 4 wherein the inserts or tools 36 and 37 which are formed similarly to the insert 27 are engaged by a suitable screw 38, the head of which screw 38 is seated in the socket 39 of the insert sleeve 40. The screw 38 extends through the sleeve 40 and into the insert 37 as shown in Figure 1. The sleeve 39 is held against rotation in the leg 12 by means of a suitable key-way 41. A set-screw 42 passes through the leg 12 and binds against the sleeve 40 at the key-way 41 to lock the sleeve 40 in a set adjusted position.

The insert or tool **37** is also adjusted to a selected position by means of the adjusting screw **38**. The insert or tool **36** is similarly supported in a manner shown in section in Figure 1, which illustrates the mounting in detail for the insert **37**. In view of the fact that the structure which supports the insert **36** is merely a duplicate of the structure which supports the insert **37**, it is thought unnecessary to duplicate this description.

It should be understood that the device herein described is intended to be held firmly by the user, and the work (rod, spindle, etc.) is rotated by the lathe, drill, milling machine, or similar mechanism. The present device, therefore, differs from the conventional grinding or honing machines wherein the grinding or honing devices are usually rotated and the work is held stationary.

It should be further understood that certain detail changes may be made in the present device without departing from the spirit of the invention, so long as these changes fall within the scope of the appended claims. Also, the inserts **27** and sleeves **23** are removable so that they may be replaced by elements of varying sizes, the elements themselves being adjustable and thereby providing means for honing cylindrical surfaces of considerable variance within a given range.

Having described the invention, what I claim is:

1. A device of the character described comprising, a body provided with a work receiving aperture and a plurality of hollow outwardly radiating legs, said legs having open outer ends, each of said legs provided with a socket extending throughout its length, a sleeve member held against independent rotation within each of said sockets, each sleeve having a tapering socket at one end, a honing tool having an inner tapering end fitted into engagement with the socket of each of said sleeves to properly align the tool, said tools converging on the central axis of the work receiving aperture, an elongated anchoring screw rotatably adjustable longitudinally of each of said sleeves, said screws carrying said tools, one of said tools being held in engagement with the work under the resilient tension of a coil spring to yieldably contact the work within the work receiving aperture, the remaining tools being selectively adjustable toward and away from the work, and a removable closure for the open outer end of each leg for shielding said anchoring screws within said legs against contact with foreign objects and thereby avoiding maladjustment of the tools.

2. A device of the class described comprising a body having a work receiving aperture, said body having a tool receiving socket, a sleeve adjustable longitudinally within said socket and locked against rotation therein, said sleeve having a tapered socket at its inner end, a honing tool having a tapered tongue at its inner end fitting snugly within the tapered socket of said sleeve to properly center said tool relative to said sleeve and socket, and a screw extending longitudinally of the sleeve and passing through said tapered socket and into the tapered end of said tool for locking the tool in tight fitting engagement in said socket.

3. A device of the class described comprising a body having a work receiving aperture, said body having a tool receiving socket, a sleeve adjustable longitudinally within said socket and locked against rotation therein, said sleeve having a tapered socket at its inner end, a honing tool having a tapered tongue at its inner end fitting snugly within the tapered socket of said sleeve to properly center said tool relative to said sleeve and socket, a screw extending longitudinally of the sleeve and passing through said tapered socket and into the tapered end of said tool for locking the tool in tight fitting engagement in said socket, said tool having laterally extending shoulders extending parallel to the central axis of the work receiving aperture and extending flush with the grinding face of the tool to provide a wide honing area on the tool and to act as abutments and to limit the inward movement of the tool relative to the periphery of the work receiving aperture.

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