A. L. ROUZE.

POLISHING TOOL.

APPLICATION FILED APR. 22, 1921.

1,397,660. Patented Nov. 22, 1921.

Fig. 1.

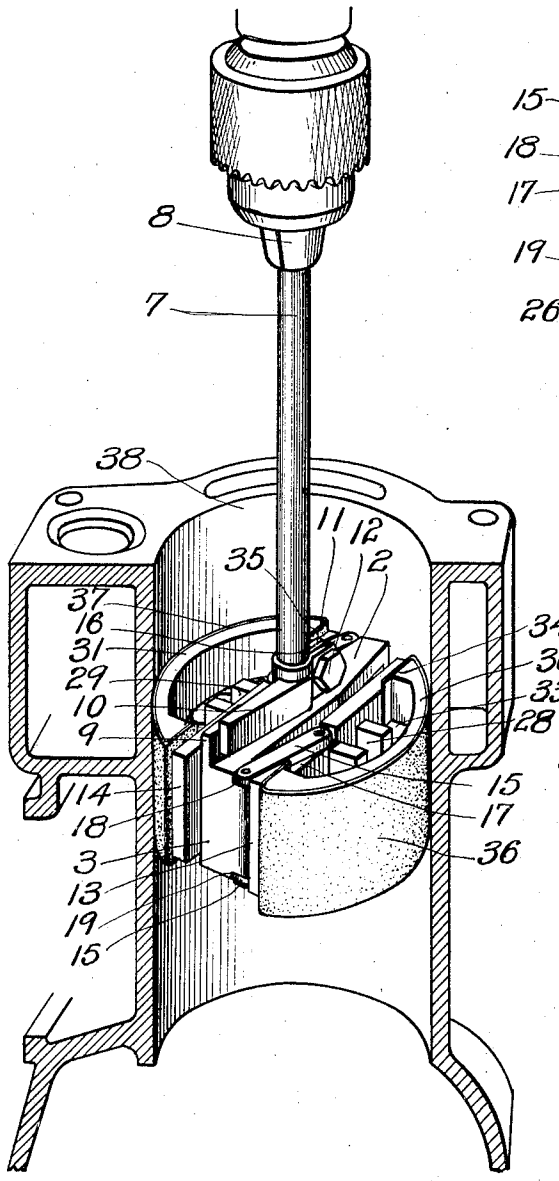


Fig. 2.

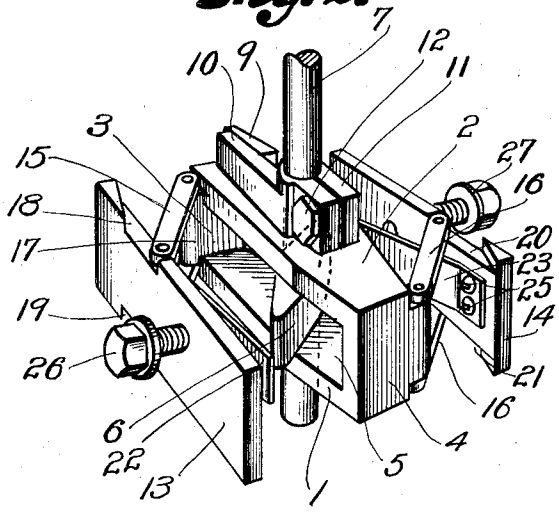


Fig. 3.

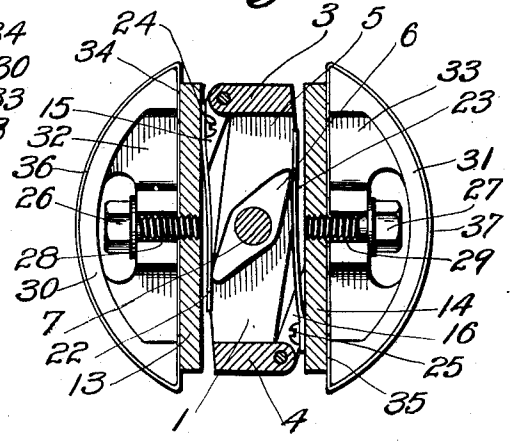
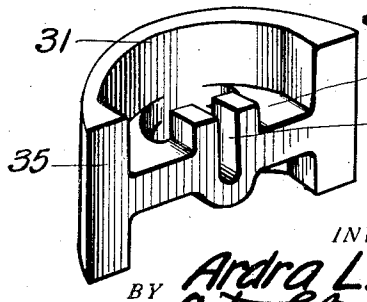


Fig. 4.



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POLISHING-TOOL.

1,397,660. Specification of Letters Patent. Patented Nov. 22, 1921.

Application filed April 22, 1921. Serial No. 463,586.

To all whom it may concern:

Be it known that I, ARDRA L. ROUZE, citizen of the United States, residing at Kansas City, in the county of Wyandotte and State of Kansas, have invented certain new and useful Improvements in Polishing-Tools; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to polishing tools for polishing metal surfaces and it is particularly adapted for polishing the interior surfaces of cylinders, for example, engine cylinders.

The invention contemplates the provision of an expansible polishing tool adapted to be rotated against the surface to be polished and to have yielding abrading or polishing surfaces adapted to exert uniform pressure throughout the entire surface with which it contacts, the pressure or polishing surface against the surface to be polished being controllable to suit varying requirements.

The invention in its more specific aspect comprises a rotatable head carrying radially expansible abrading or polishing shoes, which may have varying degrees of resilient pressure applied thereto, the shoes being of varying sizes and adapted to be interchangeable to suit varying diameters of cylinders.

The novel construction of the preferred embodiment of my invention will be apparent by reference to the following description in connection with the accompanying drawings, in which—

Figure 1 is a perspective view of a polishing tool constructed in accordance with my invention.

Fig. 2 is a perspective view of the tool head, the shoe-carrying plates and the connecting means between them and the head, the shoes being removed.

Fig. 3 is a cross sectional view through the head, showing the shoes in end elevation, and

Fig. 4 is a detail perspective view of one of the shoes.

The head proper of the tool is shown as consisting of a frame having side bars 1 and 2 connected by end bars 3 and 4, thereby providing a cam-receiving slot 5 in which a cam 6 is adapted to swing, the cam being mounted upon a rotatable shaft 7 extending through the side bars 1 and 2 and of sufficient length to be attached to a suitable means for rotating it. In the present instance I have shown a chuck 8, attached to the shaft 7 whereby the shaft can be rotated although it is obvious that any suitable means may be utilized for imparting motion to said shaft.

On one of the side bars, in the present instance 2, is an outstanding stop lug 9, which may be cast integral with the head frame and which is adapted to act as a stop for an adjustable contact finger 10, having a split portion 11 and mounted upon the shaft 7, the split portion constituting a clamp, the tension of which may be governed by operating the cap screw 12 (see Fig. 2) so that the finger 10 can be clamped to the shaft 7 but by loosening the cap screw 12, the finger 10 can be swung to any desired position to limit the swinging movement of the cam 6, as will be presently described.

On opposite sides of the head frame are shoe carriers or supports, illustrated as plates 13 and 14, which are connected to opposite ends of the head by the respective sets of links 15 and 16. The links 15 are pivoted to the projecting lip 17 and to the plate 13, as clearly seen in Fig. 2, the plate 13 being cut away to provide offsets or recesses 18 and 19 for the links so that the plate 13 may lie close to the edge of the head when the tool is collapsed or retracted. The links 16 are similarly connected to the opposite end of the head frame and to the plate 14, there being offset or recessed portions 20 and 21 for the links 16.

The plates 13 and 14 carry cushioning and tensioning members, illustrated as flat springs 22 and 23, projecting in opposite directions and fastened to the plates 13 and 14 by screws 24 and 25, respectively. The springs are fastened to opposite ends of the respective plates so that the free end of one spring projects in one direction and the free end of the other in an opposite direction, and these springs are adapted to contact with the lozenge-shaped cam 6 when it is desired to expand the tool.

The plates 13 and 14 carry cap screws 26 and 27, the shanks of which are adapted to be engaged by the U-shaped slotted por-

tions 28 and 29 of the removable shoes 30 and 31. The shoes are arc-shaped and the slots for engagement with the shanks of the cap screws are carried by the webs 32 and 33. The shoes have flat faces 34 and 35 between which and the plates or carriers 13 and 14 may be located the ends of the abrading or polishing strips 36 and 37, which may consist of emery cloth or other suitable material.

When the parts are assembled as shown in Fig. 2, the abrading material may be applied to the arch-shaped faces of the shoes 30 and 31 and then the shoes may be clamped into position, as shown in Fig. 3, where they will be held if the cap screws 26 and 27 are tightened.

The device can then be inserted in its collapsed condition with the ends of the lozenge-shaped cams within the frame and the device to be polished as, for example, the cylinder 38. When motion is imparted to the shaft in a clockwise direction, as viewed in Figs. 1 and 2, the initial movement of the shaft 7 will cause the cam 6, rigid therewith, to exert pressure against the springs 22 and 23 and thereby impart yielding radial movement to the shoe carriers 13 and 14 and force the shoes or the material on them, into contact with the surface of the cylinder. The radial expansible movement of the shoe members and the links will be limited by the position of the adjustable finger 10 on the shaft 7, for as the shaft rotates in a clockwise direction, the finger 10 will come in contact with the stop 9, thereby limiting the throw of the cam on the shaft 7. As the shaft is rotated, the abrading material or polishing strips will polish or cut away the surface of the engine cylinder.

It is to be understood that this tool is not intended primarily as a grinding tool but it can be used so as to reduce the prominence of the projecting portions caused by oil scoring and the like. It is primarily intended, however, as a polishing tool to impart a smooth polished surface to the interior of an engine cylinder whenever expedient.

After the polishing has been completed, the shaft may have a reverse rotative movement imparted to it so as to allow the shoes to collapse or retract upon the frame or head formed by the bars 1, 2, 3 and 4, thereby enabling the tool to be readily withdrawn from the cylinder.

It will also be apparent that as the tool rotates, there will be a yielding contact between the surfaces of the shoes and the part to be polished with sufficient pressure induced by the springs 22 and 23 to effectually accomplish the desired result.

If a cylinder of relatively small bore is to be polished, shoes having arcs formed on relatively short radii will be used. If a cylinder having a relatively large bore is to be polished, shoes having curved surfaces cut on longer radii will be interchanged for the smaller ones. Therefore, by providing the head with expansible side members or shoe carriers, as shown in Fig. 2, and sets of different sized shoes, the single tool may be adapted to polish any size of cylinder between two extremes.

It will, therefore, be clear that the invention is readily adapted to impart a high polish upon the interior of tubular bodies, such as cylinders, and that during its rotative movement, the effective pressure can be light enough to effect only sufficient rubbing to polish or a greater pressure can be applied by varying the position of the finger 10 on the shaft 7 so that increased pressure can be applied.

It will also be clear that the invention is easy to assemble, inexpensive to manufacture, and admirably adapted to perform the service for which it is intended.

What I claim and desire to secure by Letters-Patent is:

1. A polishing tool comprising a head, shoe-carrying plates, links connecting the shoe-carrying plates to opposite sides and opposite ends of the head so that the plates can bodily move toward and away from the head, shoes carried by the plates, and means for effecting pressure on the plates in radial directions to swing the plates outwardly out of contact with the head.

2. A polishing tool comprising a head, shoe carriers, hinged links connecting the carriers to the head at opposite ends and at opposite sides thereof, and cam fingers for moving the shoe carriers outwardly from the head.

3. A polishing tool comprising a head, shoe carriers hingedly connected to opposite ends of the head, abrading material carrying shoes removably supported by said carriers, and means for moving the carriers away from the head.

4. A polishing tool comprising a head, having a slot therein, shoe carrying plates movably connected to said head, shoes carried by said plates, a shaft rotatably mounted in the head, a cam carried by the shaft for exerting pressure in opposite directions against the respective plates, a stop on the head and a finger carried by the shaft and adapted to contact with the stop when the cam is in its functional position.

5. A polishing tool comprising a head, having a slot therein, shoe carrying plates movably connected to said head, shoes carried by said plates, a shaft rotatably mounted in the head, a cam carried by the shaft for exerting pressure in opposite directions against the respective plates, a stop on the head and a rotatably adjustable finger carried by the shaft and adapted to contact

with the stop when the cam is in its functional position.

6. A polishing tool comprising a head, having a transverse slot, a cam in said slot, an operating shaft mounted in the head and rigidly connected to the cam, shoe carriers movably connected to said head, springs connected to the carriers against which the cam may contact to force the carriers away from the head, and removable shoes carried by said carriers.

7. A polishing tool comprising an elongated head having a longitudinal, horizontal slot, shoe carriers pivoted to the ends of the head on opposite sides of the slot, abrading material supporting shoes carried by the shoe carriers, a shaft projecting through the head, a cam in the slot, the ends of which are adapted to bear against the shoe carriers, and means for limiting the swinging movement of the cam.

8. A polishing tool comprising a head consisting of spaced side bars and end bars connecting them, a shaft mounted in the side bars, a cam on the shaft between the side bars, shoe carrying plates, links connecting the respective plates to the opposite ends of the head, and shoes carried by said plates.

9. A polishing tool comprising a head consisting of spaced side bars and end bars connecting them, a shaft mounted in the side bars, a cam on the shaft between the side bars, shoe carrying plates, links connecting the respective plates to the opposite ends of the head, shoes carried by said plates, an outstanding stop on the head, and a finger rigid with the shaft to contact with the head after the cam has moved into functional position.

10. A polishing tool comprising a head consisting of spaced side bars and end bars connecting them, a shaft mounted in the side bars, a cam on the shaft between the side bars, shoe-carrying plates, links connecting the respective plates to the opposite ends of the head, shoes carried by said plates, an outstanding stop on the head, and an adjustable finger carried by the shaft to contact with the head after the cam has moved into functional position.

In testimony whereof I affix my signature.

ARDRA L. ROUZE