May 15, 1928. 1,670,068

C. P. GRIMES

TOOL FOR LAPPING INTERNAL SURFACES

Filed Feb. 23, 1927

Fig. 2.

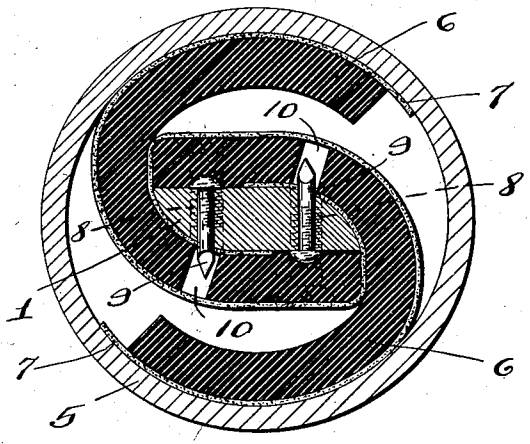
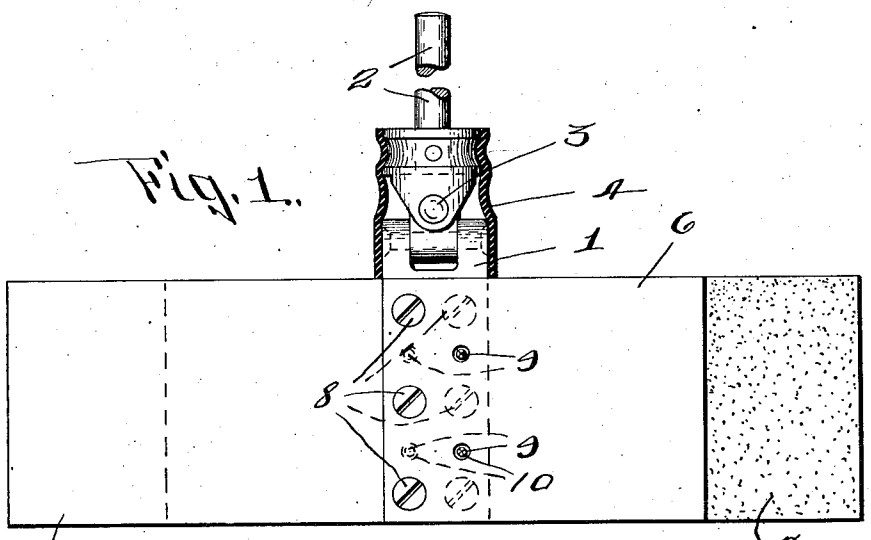


Fig. 1.



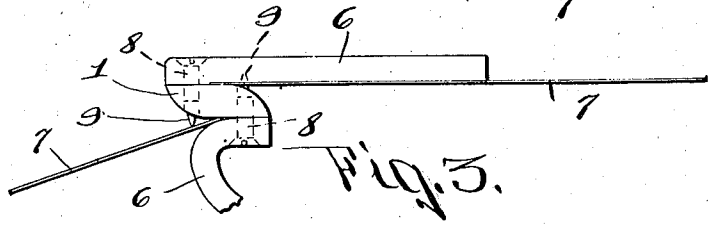


Fig. 3.

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UNITED STATES PATENT OFFICE.

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TOOL FOR LAPPING INTERNAL SURFACES.

Application filed February 23, 1927. Serial No. 170,349.

This invention has for its object a particularly simple, durable and efficient lapping tool or tool designed to finish, smooth, polish or abrade internal cylindrical surfaces, as the interiors of cylinders.

The tool is particularly designed for finishing or refinishing the cylinders used for operating hydraulic brakes on motor vehicles without demounting the cylinders from the chassis.

The invention consists in the novel features and in the combinations and constructions hereinafter set forth and claimed.

In describing this invention reference is had to the accompanying drawings in which like characters designate corresponding parts in all the views.

Figure 1 is an elevation partly in section of a preferable embodiment of this tool.

Figure 2 is an enlarged cross sectional view through the tool showing the same within the cylinder.

Figure 3 is a fragmentary end elevation illustrating the manner of securing the abrading strips in position.

This tool comprises generally a centrifugally operated abrading member and means for rotating said member. The abrading member has a flexible portion arranged to conform to an internal cylindrical surface and to be thrown outwardly by the centrifugal force against said surface. The abrading member is resilient or has a resilient backing so that it tends to press outwardly under the influence of its resiliency as well as throw outwardly. Preferably there are a plurality of abrading members in order to balance the tool during the rotation thereof as well as more accurately center it in the internal cylindrical surface. The backings are usually mounted on a body member instead of directly together and the body member has a shank for connection to any source of power.

1 designates the body which may be of any suitable form, size and construction, it having a shank 2 connected thereto by a universal joint 3. The universal joint is stiffened somewhat by a resilient means tending to yieldingly oppose its angular movement, this means being here shown as a rubber sleeve 4 around the joint. This rubber sleeve acts to prevent the body from folding to a too great angle to the shank 2 in order that the tool can be readily inserted in the cylinder as 5.

The tool is here shown as provided with a pair of oppositely disposed abrading members, each member being in the form of a flexible leaf secured at one end to the body, and normally extending outwardly therefrom, and being wrappable around the body to conform to the internal cylindrical surface, so that the free end portion of each member trails during the rotation of the body, and is thrown outwardly against the internal cylindrical surface. Each abrading member as here shown comprises a rubber backing leaf 6, the leaves being mounted on opposite sides of the body, and extending outwardly in opposite directions therefrom, each leaf being wrapped around one side edge of the body, so that its end portion trails. The abrading members in addition to the backing leaves 6 include abrading strips 7 overlying the backing leaves 6.

The body 1 is here shown as oblong in general form in cross section, and with ends beveled or rounding in opposite directions, and each backing leaf has its inner end portion mounted upon one of the flat sides of the oblong formation, and is folded around one of the rounding ends. That is it is so folded when the tool is inserted in a cylinder. The backing leaves are secured to the base in any suitable manner as by screws 8. The abrading material is preferably applied to a detachable strip instead of to the backing, these abrading strips being in the nature of emery cloth or paper and are detachably secured in position in order that they may be readily removed and replaced.

Each abrading strip 7 is preferably secured to the side of the body opposite to that on which its companion backing strip is mounted, and underlies the inner end portion of the other backing strip, and as here illustrated the body is formed with pins 9 projecting therefrom on which the strips 7 are impaled, and the inner end portions of the rubber backing strips are formed with perforations 10 in line with the pins 9. To remove and replace the abrading strips, the backing strips are bent back as shown in Figure 3, so that the abrading strip is readily removed from or pressed on the pins 9, regardless of whether or not the abrading strips have been previously formed with perforations. Normally the backing strips on account of being of rubber or some other resilient material extend outwardly in nearly a straight line.

In operation the strips are preliminarily rolled or wrapped into cylindrical form, and inserted into the cylinder. The shank 2 of the tool is then connected to any suitable source of power so that the tool is rotated. During the rotation, the backing members press outwardly under their own resiliency, and are also thrown outwardly by the centrifugal force, and owing to the universal joint 3, these backing strips or the tool centers itself in the cylinder.

This tool is particularly advantageous, in that it centers itself and bears substantially equally throughout a circle of the internal surface, and further in that it is particularly economical to manufacture and is readily handled or inserted and removed.

What I claim is:

1. A tool of the character described comprising a rotating body oblong in general form and cross section, a backing of flexible resilient material in the form of a leaf lapping one of the long sides of the oblong body formation, and wrappable around one end of the oblong formation into position to conform to an internal cylindrical surface, the free end portion being spaced apart from the body and abrading means on the outer side of the backing.

2. A tool of the character described comprising a rotating body oblong in general form and cross section, a backing of flexible resilient material in the form of a leaf lapping and secured to one of the long sides of the oblong body formation and around one end of the oblong formation into position to conform to an internal cylindrical surface, the free end portion being spaced apart from the body, and a strip of abrading material having one end secured to the opposite side of the oblong body formation to that on which the backing is secured, the abrading strip being wrappable around the outer surface of the backing.

3. A tool of the character described comprising a rotating body oblong in general form and cross section, a backing of flexible resilient material in the form of a leaf lapping and secured to one of the long sides of the oblong body formation, and wrappable around one end of the oblong formation into position to conform to an internal cylindrical surface, the free end portion being spaced apart from the body and an abrading strip having one end secured to the opposite side of the oblong body formation to that on which the backing is located, the abrading strip being wrapped around the outer surface of the backing, and a pin projecting from the body through the inner end of the strip.

4. A tool of the character described comprising a rotating body, a pair of resilient backing strips in the form of leaves having like ends mounted on the body on opposite sides of its axis, and wrappable in opposite directions around the body to conform to an interior cylindrical surface, abrading strips wrapped around the outer surface of each of the backing strips, the inner end of each abrading strip overlying the opposite side of the body to that on which its companion backing strip is mounted and underlying the inner end portion of the other backing strip.

5. A tool of the character described comprising a rotating body, a pair of resilient backing strips in the form of leaves having like ends mounted on the body on opposite sides of its axis, and wrappable in opposite directions around the body to conform to an interior cylindrical surface, an abrading strip wrapped around the outer surface of each of the backing strips, the inner end of each abrading strip overlying the opposite side of the body to that on which the companion backing strip is mounted and underlying the inner end portion of the other backing strip, and the body being formed with pins projecting therefrom on which the inner ends of the leaves are impaled, and the backing strips being formed with openings for receiving the pins.

6. A tool of the character described comprising a rotating body, backing strips of flexible resilient material in the form of leaves having their inner end portions secured to the body, the strips extending in opposite directions and wrappable in opposite directions into the general form of a letter S whereby the outer free portions of the backing strips conform to an internal cylindrical surface, abrading strips overlying each backing leaf, each strip having its end portion overlying the opposite side of the body to that on which its companion backing leaf is mounted, and underlying the inner end portion of the other leaf.

7. A tool of the character described comprising a rotating body oblong in general form in cross section, backing strips of flexible resilient material in the form of leaves having their inner end portions secured to the long sides of the oblong formation, the strips extending in opposite directions and wrappable in opposite directions around the end of the oblong formation into the general form of a letter S whereby the outer free portions of the backing strips conform to an internal cylindrical surface, abrading strips overlying each backing leaf, each strip having its end portions overlying the opposite side of the oblong formation to that on which its companion backing leaf is mounted and underlying the inner end portion of the other leaf, and the body being formed with pins projecting from opposite sides thereof, and the backing leaves being impaled on their inner ends on the pins, the inner end portion of each backing

leaf having openings for receiving the pins.

8. A tool of the character described comprising a rotating body and a centrifugally operated member comprising backing leaves of flexible material, each secured at one end to the body and the inner end portion thereof lapping the body, abrading means on the outer side of each leaf in the form of a strip overlying each backing leaf and extending at its inner end between the body and the inner end portion of the other backing leaf.

9. A tool of the character described comprising a rotating body and a centrifugally operated member comprising backing leaves of flexible material, each secured at one end to the body and the inner end portion lapping the body, abrading means on the outer side of each leaf in the form of a strip overlying each backing leaf and extending at its inner end between the body and the inner end portion of the other backing leaf and pins in the body having points extending through the abrading strips, the backing leaves having perforations for receiving the points of the pins extending through the abrading strips associated with the other leaf.

In testimony whereof, I have hereunto signed my name at Syracuse, in the county of Onondaga, and State of New York, this 12th day of February, 1927.

CHARLES P. GRIMES.