July 15, 1947. E. E. NORDGREN ET AL 2,423,992

ROTARY BUFFING TOOL

Filed April 3, 1946

Fig. 1

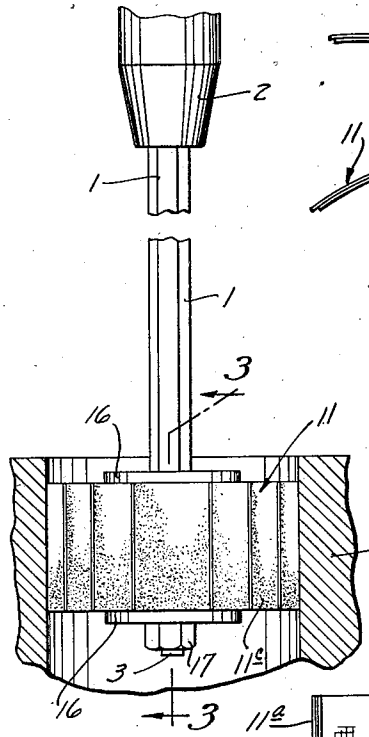


Fig. 2

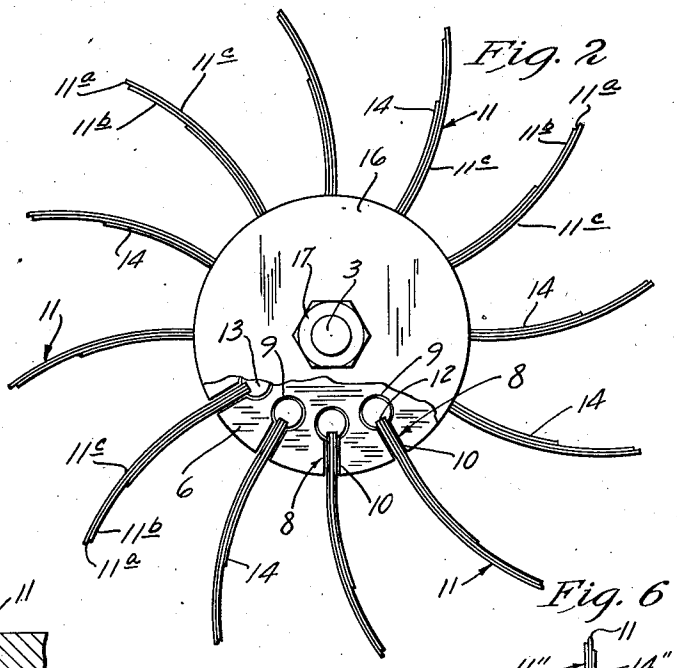


Fig. 6

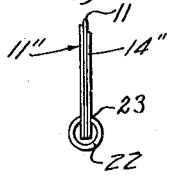


Fig. 3

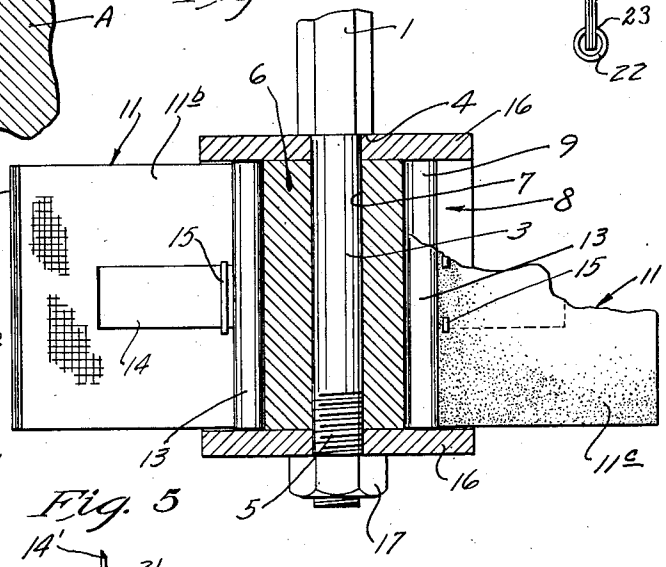


Fig. 4

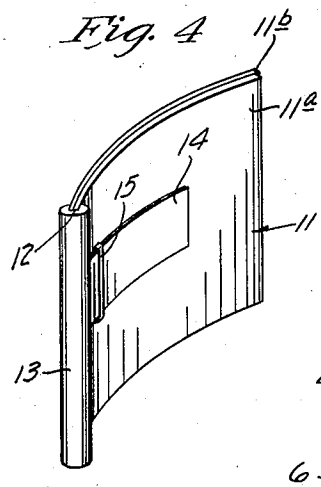
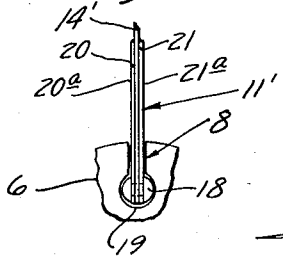


Fig. 5



Inventors
Elmer E. Nordgren
Roy W. Hagenstad
By their Attorneys
Merchant & Merchant

Patented July 15, 1947

2,423,992

UNITED STATES PATENT OFFICE

2,423,992

ROTARY BUFFING TOOL

Elmer E. Nordgren and Roy W. Hagenstad,
Minneapolis, Minn.

Application April 3, 1946, Serial No. 659,235

4 Claims. (Cl. 51—190)

1

Our invention relates broadly to rotary wiping tools and more specifically to rotary-buffing tools of the type used in the reconditioning of worn engine cylinders.

An important object of our invention is the provision of a tool in which the worn wiping elements can be readily replaced and renewed in a permanent rotary head.

Another object of our invention is the provision of a rotary head having novel anchoring channels for the wiping elements together with novel cooperating anchors for the replaceable wiping elements.

Another important object of our invention is the provision of resilient reinforcing means for the replaceable wiping elements.

The above and other important objects of our invention, as well as the means for carrying the same into effect, will become apparent from the following detailed specification, appended claims and attached drawings.

Referring to the drawings wherein like characters indicate like parts throughout the several views:

Fig. 1 is a side plan view showing our novel rotary buffer being utilized to roughen the walls of a worn engine cylinder;

Fig. 2 is an enlarged bottom plan view of the structure shown in Fig. 1, some parts being broken away;

Fig. 3 is a vertical axial section taken substantially on the line 3—3 of Fig. 1, some parts being broken away;

Fig. 4 is a perspective view of one of the replaceable wiping elements and anchoring bars;

Fig. 5 is a fragmentary view illustrating a modified arrangement of wiping element, resilient reinforcing element, and anchoring means; and

Fig. 6 is a side plan view of a wiping element and illustrating a modified form of anchoring clip therefor.

Referring more specifically to the drawings, the numeral 1 illustrates a rotary shaft or shank having its upper end, as shown in Fig. 1, secured to the chuck 2 of a power drill or the like. The lower end of shank 1 is reduced at 3 so as to provide a shoulder 4. The extreme lower end of reduced portion 3 of shank 1 is threaded as indicated by the numeral 5. A head 6 having an axial opening 7 therethrough, of a size to snugly accommodate the reduced end portion 3 of shank 1, is preferably, and as shown, of generally cylindrical form. The cylinder block is identified by the letter A.

As shown, particularly in Figs. 2 and 3, the

2

cylindrical head 6 is provided with a plurality of circumferentially spaced channels 8 which preferably extend throughout the length thereof in parallel relation with the axis of the head, thereby opening through both ends of the head. The channels 8 include inner base portions 9 having substantially cylindrical walls and substantially restricted portions in the form of slots 10 having parallel and radially disposed walls which communicate with the inner base portions 9 and open through the wall of the cylindrical head.

Referring to Fig. 4, the wiping elements 11 comprise a plurality of superposed plies of abrasive-coated fabric 11*a* and 11*b*, the abrasive surfaces of which are identified by the numeral 11*c*. The inner ends of abrasive sheets 11*a* and 11*b* are secured by glue or other suitable adhesive into the elongated radially-opening slots 12 in anchoring bars 13, preferably, and as shown, being of cylindrical form. It will be observed here that the width of wiping elements 11 substantially correspond to the length of the anchoring bars 13 and that the length of the anchoring bars 13 also corresponds substantially to the length of channels 8.

Referring now specifically to Figs. 2 and 3, it will be observed that anchoring bars 13 are adapted to be inserted from either end of the cylindrical head 6, into the enlarged portions 9 of channels 8 and that the anchoring bars are held against movement radially of the head by the restricted portions 10 of channels 8. It will also be observed that the wiping elements 11 are sufficiently narrow to permit the same to fit into and project outwardly through the restricted portions 10 of channels 8.

Another important feature of our invention is the use of a resilient reinforcing member behind the work-engaging faces 11*c* of the wiping elements 11. These reinforcing elements may be made from any suitable material but preferably, and as shown in Fig. 4, are in the nature of tongue-like springs 14, preferably anchored both in the slots 12 of anchoring bars 13 and also to the wiping elements by such means as staples 15. Reinforcing elements 14 are preferably both narrower and shorter than the wiping elements behind which they are located and tend to exert yielding pressure against the same, thereby of course, increasing the pressure of the wiping elements against the work.

A pair of disc-like plates 16 are adapted to be fitted over the reduced end 3 of shank 1, one thereof to be interposed between the shoulder 4

and the adjacent end of the head 6, and the other to be interposed between the opposite end of head 6 and a nut 17 which is capable of being tightened to the point where head 6 and plates 16 rotate as a unit with shank 1.

With respect to the structure shown in Fig. 4, the abrasive surfaces of the wiping elements 11 may be initially renewed by merely tearing off the uppermost layer 11*b* so as to make available for wiping action the immediately underlying layer 11*a*. This, of course, may be done without removing the wiping elements 11*a* and the anchoring bars 13 from the channels 8 of head 6. When the abrasive surface of layer 11*a* has been worn beyond the point of usefulness, the wiping elements 11 may be replaced by removing of nut 17 from the threaded end 5 of shank 1, then removing the immediately-underlying endplate 16 so as to expose the open ends of channels 8. The worn wiping elements 11 together with the anchoring bars 13 are then slidably removed from the end of the head 6 and replaced with new inexpensive wiping elements and anchoring bars. Of course the endplates 16 and nut 17 are then put in place, both to lock the wiping elements 11 and anchor bars in place, and to cause the head 6 and plates 16 to rotate as a unit with shank 1.

Referring now to the structure of Fig. 5, we there show a modified form of anchor in the nature of spaced rivets or the like 18 which extend crosswise in the suitably-shaped wide bottom portion of channels 19.

Fig. 5 also illustrates a modified form of arranging the abrasive sheets 20 and 21 of the wiping element 11'. Here the abrasive sheets 20 and 21 are arranged back to back with the abrasive surfaces thereof being indicated by the numerals 20*a* and 21*a*, respectively. It will be here noted that the resilient reinforcing member 14' is interposed between the abrasive sheets 20 and 21. Of course this arrangement of abrasive sheets and resilient reinforcing member is not limited to the anchoring means shown in Fig. 5 but could be used with equal facility with the structures shown in Figs. 4 or 6. Nor is the anchoring means of Fig. 5 to be limited to the arrangement of abrasive sheets and resilient reinforcing member shown therein, for obviously such anchoring means could be used with equal facility on the arrangement of abrasive sheets and resilient reinforcing member shown in Figs. 4 and 6. However, it should be noted that with the arrangement of abrasive sheets illustrated in Fig. 5, it is necessary that the nut 17 as well as the immediately underlying endplate 16 be removed from the shank 1 when it is desired to reverse the position of the wiping elements 11' to make available the opposite unworn side thereof.

In Fig. 6 we illustrate a modified form of anchoring bar which comprises a tube 22 having a slot 23 into which the wiping element 11, together with the wiping element 11'' and resilient reinforcing member 14'' are tightly clamped.

The term wiping element as herein used is not limited to abrasive sheeting alone, but is broad enough to include a plurality of bristles mounted in the anchoring means whereby to provide a brush.

In accordance with the patent statutes, we have described the principles of construction and operation of our buffing tool; and while we have endeavored to set forth the best embodiments thereof, we desire to have it understood that this is only illustrative of a means of carrying out our invention, and that obvious changes may be made within the scope of the following claims without departing from the spirit of our invention.

What we claim is:

1. In a device of the class described, a rotatable head of generally cylindrical form, a plurality of circumferentially spaced channels in said head extending parallel with the axis and opening through one end thereof, said channels including restricted radial portions opening through the cylindrical wall of the head and enlarged base portions, elongated anchoring bars removably disposed in the enlarged portions of the channels and being of greater width than that of the restricted portions of the channels, whereby confining the anchoring bars to movement lengthwise of the head for removal or replacement through the open ends of the channels at said one end of the head, wiper elements secured to said anchoring bars and projecting radially outwardly of said head through the restricted portions of the channels, and a plate removably secured to said head in overlapping relation to the open ends of the channels for retaining the anchoring bars in the channels.

2. In a device of the class described, a rotatable cylindrical head, a plurality of circumferentially spaced channels in said head extending parallel with the axis and opening through both ends thereof, said channels including restricted parallel walled radial portions opening through the cylindrical wall of the head and enlarged cylindrical base portions, elongated cylindrical anchoring bars of the length of said channels and substantially of the same diameter as the enlarged base portions thereof and removably disposed therein whereby the anchoring bars are confined to movement into or out of the channels from the ends of the head, wiper elements of a width equal to the lengths of the anchoring bars secured to the bars and projecting radially outwardly through the restricted portions of the channels, and plates removably secured to opposite ends of the head in lapping relation to the opposite ends of the channels and portions of said wiper elements for retaining the anchoring bars in the channels.

3. The structure according to claim 1 together with a leaf spring secured to the intermediate portion of each of said anchoring bars, the leaf springs projecting radially outward of the head through the restricted portions of the channels behind the wiper elements.

4. The structure according to claim 1 wherein the anchoring bars comprise cylindrical metal tubes having elongated slots extending through their walls and in which the inner ends of the wiper elements are clamped.

ELMER E. NORDGREN.
ROY W. HAGENSTAD.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,259,475	Koether	Oct. 21, 1941
2,194,577	Vonnegut	Mar. 26, 1940
2,316,257	Krastin	Apr. 13, 1943