June 8, 1937. J. R. ROSE ET AL 2,083,400

HONING TOOL

Filed Feb. 15, 1935

Fig. 1.

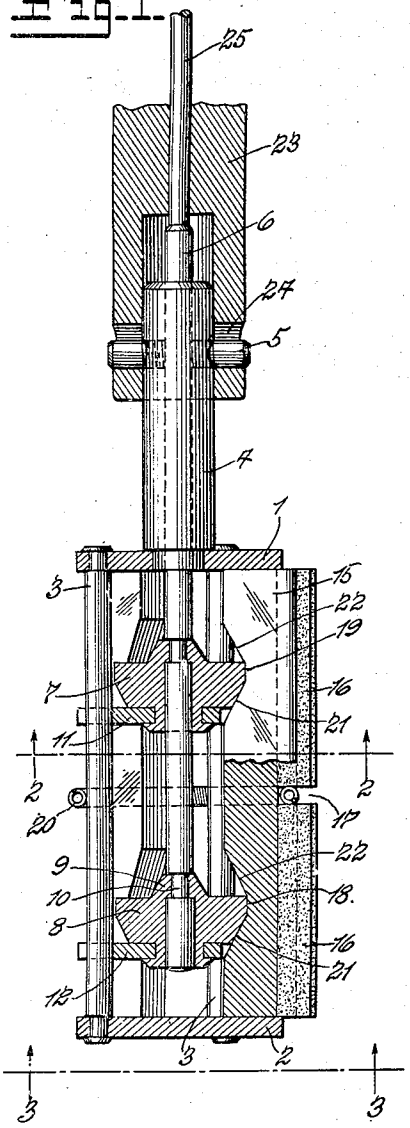


Fig. 2.

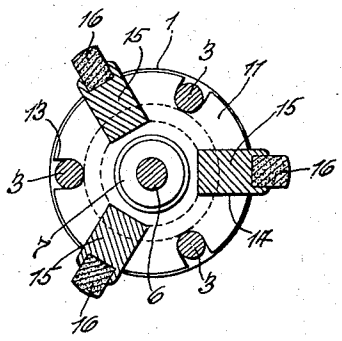


Fig. 3.

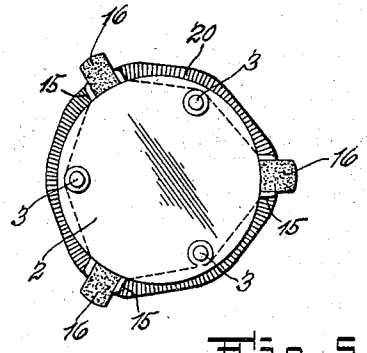


Fig. 5.

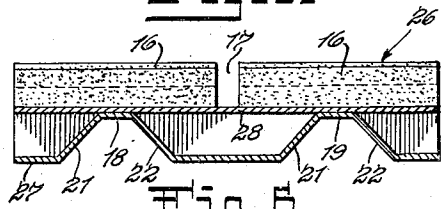


Fig. 4.

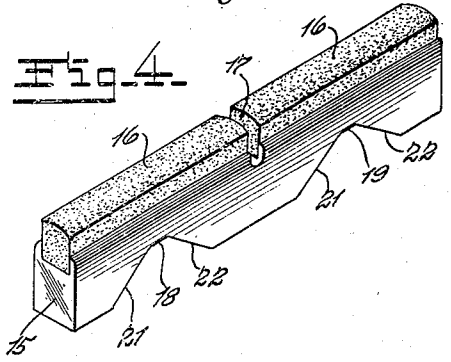
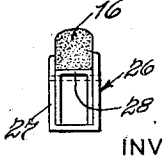


Fig. 6.



INVENTORS
JOHN R. ROSE
JOHN C. COX
FRANK H. MAAS

BY L. G. Huffman

ATTY

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HONING TOOL

John R. Rose, University City, John C. Cox and Frank H. Maas, St. Louis, Mo., assignors to Wagner Electric Corporation, St. Louis, Mo., a corporation of Delaware

Application February 15, 1935, Serial No. 6,656

10 Claims. (Cl. 51—184.3)

Our invention relates to a honing tool and more particularly to honing tools for cylinders in which the grinding stones may be radially adjusted by an axially slidable member.

One of the objects of our invention is to produce an improved hone in which the guiding and supporting means for the radially movable stone carriers is carried by the axially slidable member which is adapted to radially adjust the stone carriers.

Another object of our invention is to produce a honing member for a honing tool which is so constructed that it can be mounted in the tool in two positions, one position being the reverse of the other.

Still another object of our invention is to produce a honing tool which is simple in construction, efficient in operation, and economical to manufacture.

Other objects of our invention will become apparent from the following description taken in connection with the accompanying drawing illustrating a single embodiment thereof, in which Figure 1 is a side view, partially in cross-section of our improved honing tool; Figure 2 is a cross-sectional view on the lines 2—2 of Figure 1; Figure 3 is an end view of the honing tool; Figure 4 is a perspective view of one of the stone carriers and a stone; and Figures 5 and 6 are longitudinal cross-sectional and end views, respectively, of a modified stone carrier made from pressed steel.

Referring to the drawing in detail, the cage of the tool comprises a pair of spaced apart plates 1 and 2 rigidly connected together by three rods 3. The upper plate has rigidly secured thereto a tubular driving head 4 provided with a pair of attaching lugs 5. An axial slidable shaft 6 is received by the tubular head and extends into the cage betwen the rods 3. That portion of the shaft in the cage carries two similar cone-shaped cam members 7 and 8, both of which have their inclined surfaces inclined in the same direction. These cone-shaped cams are fixed to the shaft against relative axial movement by the portions 9 thereof being contracted into the annular grooves 10 in the shaft 6.

The cam 7 carries a guiding and supporting member 11 and the cam 8 carries a similar guiding and supporting member 12. Each of these members is provided with three notches 13 for receiving the rods 3 and each is also provided with three notches 14 for receiving and guiding the stone carriers 15. The members 11 and 12 are secured to their respective cam members by peaning over the ends of the cams, as shown in Figure 1. One of the guiding and supporting members is preferably mounted slightly loose on its cam member, thus permitting compensation for any mis-alignments during assembly. The slots 14 for receiving the stone carriers, are spaced intermediate the rods 3.

The stone carriers 15 are shown as being made of a single piece of stock and are provided with grooves on their external faces for receiving and holding the grinding stones 16. Each stone 16 is composed of two parts slightly spaced apart to form a groove 17 at the central portion of the stone. The inner surface of each stone carrier member has formed therein a pair of V-shaped notches or recesses 18 and 19 for cooperation with cams 7 and 8, as shown in Figure 1. The stone carriers are prevented from longitudinal movement, when placed in the cage, by the end plates 1 and 2 and are resiliently held in operative position against cams 7 and 8 by means of an annular coil spring 20 which fits in notch 17, the notch being of sufficient depth to allow the spring to be below the abrading surface of the stone.

The inclined surfaces 21 and 22 forming each V-shaped notch or recess in the stone carrier have the same angle of inclination and each V-shaped notch or recess is positioned an equal distance from the adjacent end of the stone carrier. This construction permits the stone carrier to be placed in the cage in either of two operative positions, one being the reverse of the other. When in one position, the surfaces 21 cooperate with the cams 7 and 8, and when in the other position the surfaces 22 cooperate with cams 7 and 8. By having a stone carrier which is reversible, a more even wearing of the stones results.

When our improved stone carrier is in position upon the driving spindle 23, the attaching lugs 5 will be received in notches 24 and shaft 6 will abut the slidable rod 25 which is the usual rod for moving the shaft 6 axially and thereby radially and uniformly expand the stones.

In Figures 5 and 6 we have shown a stone carrier 26 made of pressed steel which, if desired, may be used in place of the solid stone carrier. A U-shaped member 27 forms the base of the carrier and is provided with V-shaped notches or recesses 18 and 19 formed by deforming the base of the U-shaped member in the manner shown. To provide a support for the two parts of the stone 16, a second U-shaped member 28 is secured within the member 27 but in an inverted position. The height of this second member is such that when it is in position, the ends of the

legs of the U-shaped member 27 will form lateral supporting flanges for the stone. The legs of the U-shaped member 28 are provided with notches to receive the deformed portions of member 27 which form the notches 18 and 19. The members 27 and 28 may be rigidly secured together in any desired manner such as brazing, welding, etc. This type of stone carrier is economical to manufacture besides being light and strong.

Having fully described our invention, what we claim as new and desire to secure by Letters Patent of the United States is:

1. In a honing tool, a rotating cage, an axially slidable stem centrally carried by said cage and provided with wedging means, a stone carrier provided with means for cooperating with the wedging means whereby the stone carrier may be radially moved by the axial movement of the stem, and means carried by and movable with the axially slidable stem and slidably cooperating with the stone carrier and with the rotating cage for guiding the stone carrier and preventing relative rotative movement of said stone carrier and the cage.

2. In a honing tool, a rotating cage provided with a pair of spaced apart members secured together by a plurality of rods, an axially slidable member disposed in said cage and provided with wedging means, a stone carrier provided with an inclined surface cooperating with the wedging means, and a plate carried by the axially slidable member, said plate being provided with a slot for receiving the stone carrier and with means for slidably cooperating with the cage rods to prevent relative rotation therebetween.

3. In a honing tool, a rotating cage provided with a pair of spaced apart members secured together by a plurality of rods, an axially slidable member disposed in said cage and provided with a pair of cones, a plurality of stone carriers provided with inclined surfaces for cooperating with the cones, and a pair of plates carried by the axially slidable member, each of said plates being provided with slots for receiving and supporting the stone carriers and with means for slidably engaging the rods to prevent relative rotation therebetween.

4. In a honing tool, a rotatable shaft provided with a plate, a second plate spaced therefrom, a plurality of circumferentially spaced rods for securing the plates together, an axially slidable rod in the shaft and extending into the space between the rods, two cone-shaped members carried by the rod, longitudinally extending stone carriers between the plates provided with inclined surfaces engaging the cone-shaped members, and spaced apart guiding and supporting members carried by the axially slidable rod, each member being provided with slots for receiving and guiding the stone carriers and other slots for slidably receiving the rods.

5. In a honing tool, a rotating cage, two axially spaced slidable conical members in said cage, said conical members being movable axially as a unit and having their surfaces extending in the same direction, and a reversible stone carrier for cooperating with the conical members, said stone carrier being provided with two spaced sets of surfaces with each set comprising two surfaces in diverging relation, the surfaces of the sets which are inclined in one direction being adapted for cooperation with the conical members when the carrier is in one position in the cage, and the other surfaces of the sets which are inclined in the other direction being adapted for cooperation with the conical members when the carrier is reversed end for end and positioned in the cage.

6. A honing tool stone carrier comprising a pair of reversely positioned U-shaped members having their legs interengaged and secured together and their base portions in spaced relation.

7. A honing tool stone carrier comprising a pair of reversely positioned U-shaped members having their legs in interengaging relation, the outer base surface of one of said members being adapted to support a honing stone.

8. A honing tool stone carrier comprising a pair of opposed U-shaped members in interengaging relation, the base of one of said members and a portion of the legs of the other member forming a stone receiving groove.

9. In a stone carrier for cooperation with a cam member, a U-shaped member having a portion of its base deformed to form a recess having an inclined surface.

10. A honing stone carrier comprising a U-shaped member the legs of which are adapted to receive a honing stone, and a supporting member within the U-shaped member and having a portion spaced from the inner base surface of said U-shaped member for supporting the stone.

J. R. ROSE.
JOHN C. COX.
F. H. MAAS.