

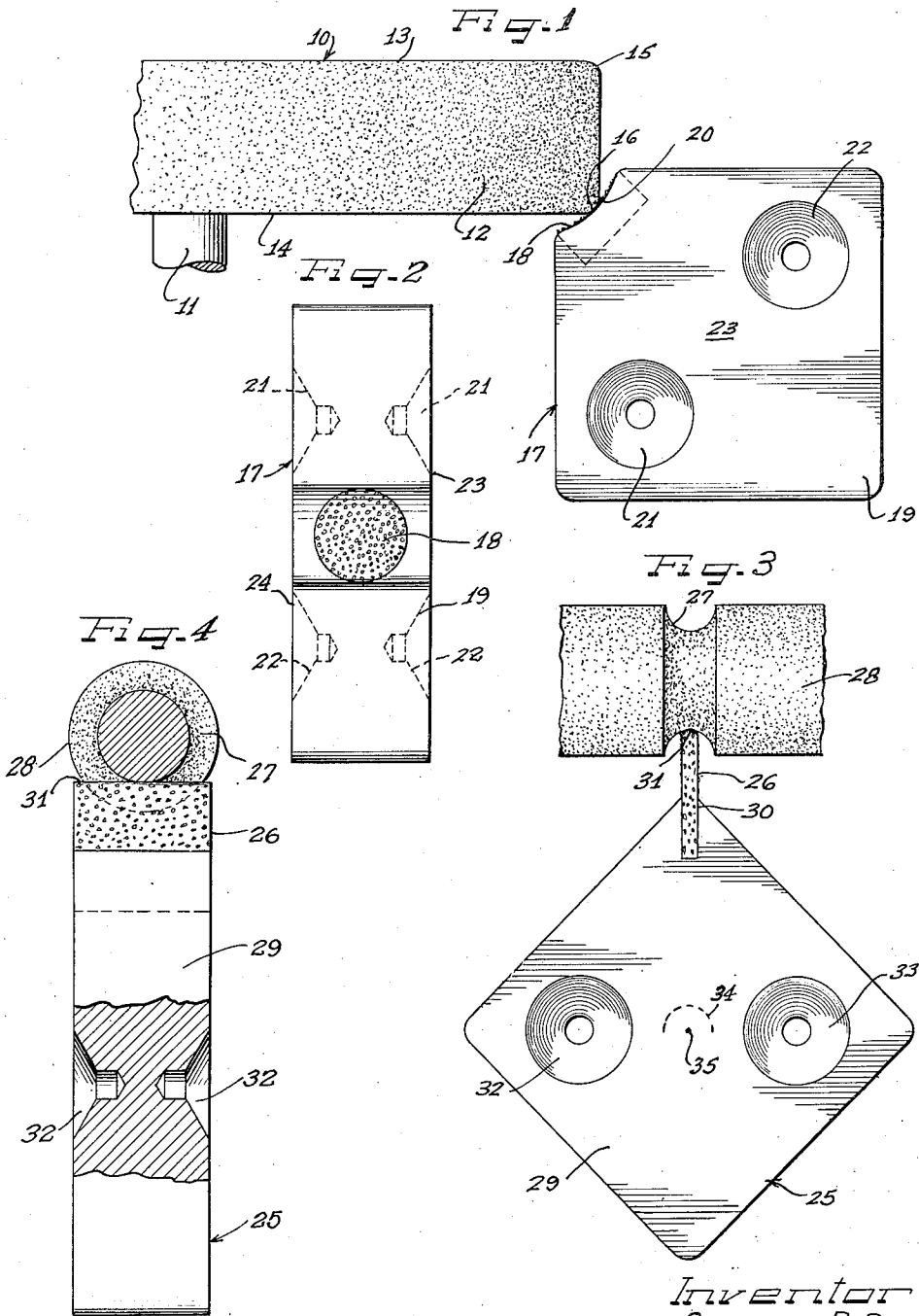
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MANUAL TOOL FOR DRESSING GRINDING WHEELS

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MANUAL TOOL FOR DRESSING GRINDING WHEELS

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The present invention relates to tools for dressing grinding wheels and the like and more particularly relates to manual tools for abrading grinding wheels.

Dressing of grinding wheels to form radius curves thereon is generally considered, in the industry, to be a manual dressing operation which generally has heretofore been performed, by the use of a single point diamond tool, or a diamond cluster tool, or an abrasive stick, or sometimes even a piece of an old grinding wheel. All of these utensils have been found to be generally unsatisfactory for the purpose, however, since the use of any of them is difficult with the result that accuracy in dressing the wheels is extremely difficult. For example, in grinding of crank shafts, such as those to be used in internal combustion engines it is necessary that the corners or edges of the grinding wheel have a preformed radius curve thereon which should be maintained substantially constant during the grinding operation. Since dressing the edges of the wheel with the aforementioned tools is extremely difficult great difficulty is experienced in maintaining a proper radius curve edge on the grinding wheel. The result of such difficulty may be so disastrous as to upset production schedules or to cause the production of faulty parts. Further, manufacturing techniques today are based on increasingly faster production schedules which require surer methods of establishing the desired form on grinding wheels.

These same difficulties occur where it is necessary to form variously configured grooves such as radius grooves in a grinding wheel. The formation of such grooves has also heretofore been effected by practices utilizing the aforementioned tools which are difficult to use and/or frequently ineffective to perform the desired job.

In accordance with the principles of the present invention, however, there is provided a new and improved hand or manually operated grinding wheel abrading and dressing tool which is operative to permit efficient and accurate formation of radius curves on grinding wheels. In accordance with this invention, a block body, operable as a handle, is formed with two pairs of diametrically opposed finger and thumb recesses therein for properly gripping and manipulating the tool. A recessed corner of the tool has secured thereto a diamond abrading head formed of a matrix with abrading diamonds set therein.

By location of the abrading head in the edge of the tool body, the radius dressing may be effected without any danger of grooving or scuffing any face of the grinding wheel. Also, the formation and placement of finger and thumb recesses or "dimples" in the block permits accurate manipulation thereof so that the desired radius curves may be formed on the grinding wheel accurately as measured by gages or templates which may be formed of such material as sheet fiber, plastic or wood or other desired material.

It is, therefore, an important object, and feature of the present invention to provide a new and improved manual tool for abrasively dressing grinding wheels by providing a handle block with an abrading head fixed thereto.

Another object and feature of the present invention is to provide a new and improved manual tool for abrasively dressing grinding wheels and providing the same with a block having a set of pairs of finger and thumb recesses or "dimples" therein for efficiently and accurately manipulating the tool.

Yet another object of the present invention is to provide a new and improved manual dressing tool with a block body and an abrading head set in a recess in an edge thereof whereby the block may be accurately manipulated to form radius curves on the edges of grinding wheels and in the body of the grinding wheel as desired.

Yet another object of the present invention is to provide a new and improved dressing tool for manual operation which is further provided with a handle body having gripping and manipulating recesses therein and an edged recess in which an abrading head is set, the abrading head and the edge recess of the block having a contour such that the tool may be manipulated to form radius curves on edge of grinding wheels without grooving or scuffing either face or side of the grinding wheel.

Still another object of the present invention is to provide a new and improved manual grinding wheel dressing tool as described with symmetrically disposed gripping means therein whereby the tool may be accurately manipulated to form an accurate radius or other form curve on the grinding wheel.

Still other objects, features and advantages of the present invention will become apparent from the following detailed description of the invention and embodiments thereof, from the claims, and from the accompanying drawings in which each and every detail shown is fully and completely disclosed as a part of this specification, in which like reference numerals refer to like parts, and in which:

Figure 1 is a fragmentary plan view of a grinding wheel in operational engagement with a manual dressing tool embodying the principles of this invention;

Figure 2 is an elevational view of the tool of Figure 1;

Figure 3 is a fragmentary plan view of another grinding wheel in operational engagement with another tool embodying the principles of this invention; and,

Figure 4 is a partial sectional and elevational view of the tool and grinding wheel of Figure 4.

As shown on the drawings:

There are illustrated in the drawings two embodiments of the present invention of a manually operable abrading or dressing tool which is effective to permit accurate and efficient dressing of grinding wheel to form curves upon the same. In the embodiment of the invention illustrated in Figures 1 and 2, a grinding wheel 10 is rotated and power driven by a shaft 11 which may be connected to any source of driving power such as a motor or prime mover or the like. The grinding wheel 10 has a peripheral surface 12 meeting radial faces 13 and 14 at edges 15 and 16 that are to be formed with curves such as radius curves thereon for such purposes as crank shaft grinding or the like as may be desired. This utilization of the grinding wheel, and of the manual tool hereinafter described, are merely illustrative of uses for the invention and are not intended as limitations upon the invention.

To form these curved edges 15 and 16 accurately and efficiently, in accordance with this invention, whereby the same may be gauged with radius gauges or templates or the like, there is provided, by this invention, a dressing tool 17 having an abrading and dressing head 18 thereon which is effective to properly form the edges 15 and 16 when the tool 17 is manipulated. To manipulate the tool 17 with its abrading and dressing head 18 accurately and efficiently, the tool is provided with a main tool body 19 which, in the form shown, is effective as a handle block, and is substantially rectangular or substantially

square. While the particular shape of the block is not generally critical, certain features of the shape thereof form important parts of this invention as hereafter described. The block or body is preferably formed of a substantially rigid material such as metal.

An edge corner of the block 19 is recessed to receive the tool head 18 which, as shown in Figures 1 and 2, is a matrix having abrading materials such as diamonds set into the outer or abrading face thereof or mixed therewith as desired. The tool head 18, is shown in Figures 1 and 2 as a round head or cylindrical head set deep into the recess provided therefor in the corner edge of the tool block 19 with just the diamond abrading face thereof accessible and the head is fixed and secured in the tool block in this position. The face of the tool head 18 and the recess of the corner edge 20 of the tool block 19 where the tool head 18 is set, preferably are not flat but are vertically rectilinear with a smooth curve of greater angular dimension than that of the curved edges 15 and 16 to be formed on the grinding wheel 10.

By such form of face on the tool head 18 and the corner edge recess on the block or body 19, the tool may be effectively manipulated to form the curved edges 15 and 16 on the grinding wheel without any appreciable danger of scuffing, scarring or grooving the peripheral face 12 of the grinding wheel 10 or either radial face 13 and 14 thereof.

Formation of the curved edges 15 and 16 is thus accomplished with this tool by manipulation of the same so that the abrading head 18 engages the corner edges and is then moved in such an arcuate path as to smoothly abrade and dress the corner edges of the grinding wheel. For smoothly manipulating the tool, and forming an important feature of this invention, the handle block or tool body 19 is provided with two symmetrically disposed sets or pairs of opposed finger and thumb recesses or "dimples" 21 and 22. The recesses or "dimples" of each pair appear in opposite faces 23 and 24 of the block 19 and are directly opposite to each other such that the recesses 21—21 directly oppose each other and recesses 22—22 directly oppose each other. In addition to pairs of the recesses being co-axial, these recesses are so formed and arranged as to provide means symmetrically spaced with respect to the transverse center axis of the block for effectively and firmly gripping the block with merely the thumb and forefinger of each hand of the operator of the tool. For manipulating efficiency, these recesses are preferably annular so that with proper arm and/or hand movement the tool may be pivoted about said axis or about any other desired axis or moved in any desired manner with great ease and efficiency. Further enhancing the manipulation of the tool, the pairs of recesses are respectively disposed at laterally opposed positions on the block, and arranged so that they are symmetrically spaced with respect to the tool head and tool receiving recess the center line of which passes through the aforementioned transverse axis.

The embodiment of the invention illustrated in Figures 3 and 4 shows a manual dressing tool 25 having a dressing and abrading head 26 in operative engagement with an annular groove 27 in a grinding wheel 28. The tool 25 has a block body 29 which is also substantially rectangular and is of substantially the same character in configuration and rigidity as the body or handle block 19 of the tool 17. A corner edge 30 of the block body 29 is recessed to receive the tool head 26 which, in the form shown here, is a strip-like tool head of substantially the same height as the thickness of the block (Fig 4) and has a smoothly rounded outer edge 31, by way of

example, so that manipulation of the tool will permit accurate and efficient formation of the curved groove 27 in the periphery of the grinding wheel 28. For manipulating the tool, the block body is also provided with two pair of finger-thumb recesses 32 and 33 which are disposed with relation to each other and with relation to the tool head substantially the same as the two pair of recesses 21 and 22 are with respect to each other and respect to the tool head in the embodiment of Figures 1 and 2.

By grasping the tool 25 with the thumb and fingers of each hand in the recesses 32 and recesses 33, the tool may be moved in any desired manner so easily and efficiently as to accurately form a groove in the periphery of the grinding wheel 28. The groove may then be gauged for accuracy etc.

Exemplifying the various controlled paths through which the tools may be manipulated, there is illustrated a dashed line on the block 29 in Figure 3. There, the point 35 indicates the transverse center about which the tool may be moved. The path line 34 indicates the path of movement for forming the groove 27 in the wheel 28. Numerous other paths and movements may, of course, be effected with this tool, such as the path for forming the curved edges 15 and 16 of Figure 1.

From the foregoing it will be readily observed that by the principles of the present invention there is provided a new and improved manual tool for dressing grinding wheels, numerous variations and modifications of which tool may be made without departing from the true spirit and scope of the novel concepts and principles of this invention. I, therefore, intend to cover all such modifications and variations.

I claim as my invention:

1. A manual tool for dressing grinding wheels comprising a rigid body having thumb and finger recesses symmetrically arranged about a transverse axis, an edge of said body having a recess therein the center line of which passes through said axis and a tool head secured in said recess and presenting an abrading work face.
2. A manual tool for dressing grinding wheels comprising a rigid block of a size to be held between the fingers of the operator's hands, said block having on opposite parallel flat faces thereof thumb and finger recesses symmetrically arranged about a plane therebetween normal to said faces, and a tool head having a median plane coincident with said plane of symmetry and presenting an arcuate abrading work face.
3. A manual tool as defined in claim 2 in which an edge of said block is provided with a recess for receiving and firmly retaining said tool head.
4. A manual tool as defined in claim 2 in which the tool head projects from an edge of said block and presents a narrow convexly rounded work face.
5. A manual tool as defined in claim 2 in which the tool head presents a circular concavely rounded work face.

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