June 23, 1953 O. H. CALLOWAY 2,642,856

ABRASIVE WHEEL DRESSER

Filed Nov. 21, 1950 4 Sheets-Sheet 1

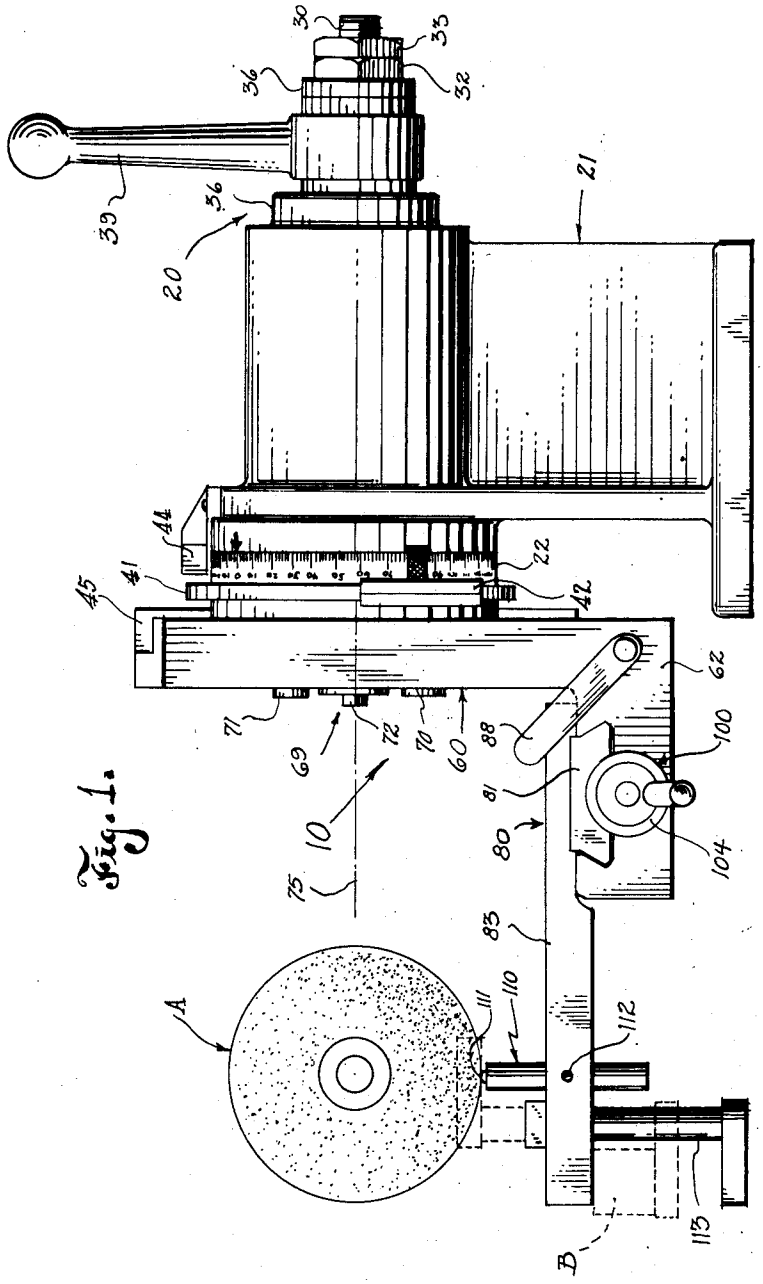


Fig. 1.

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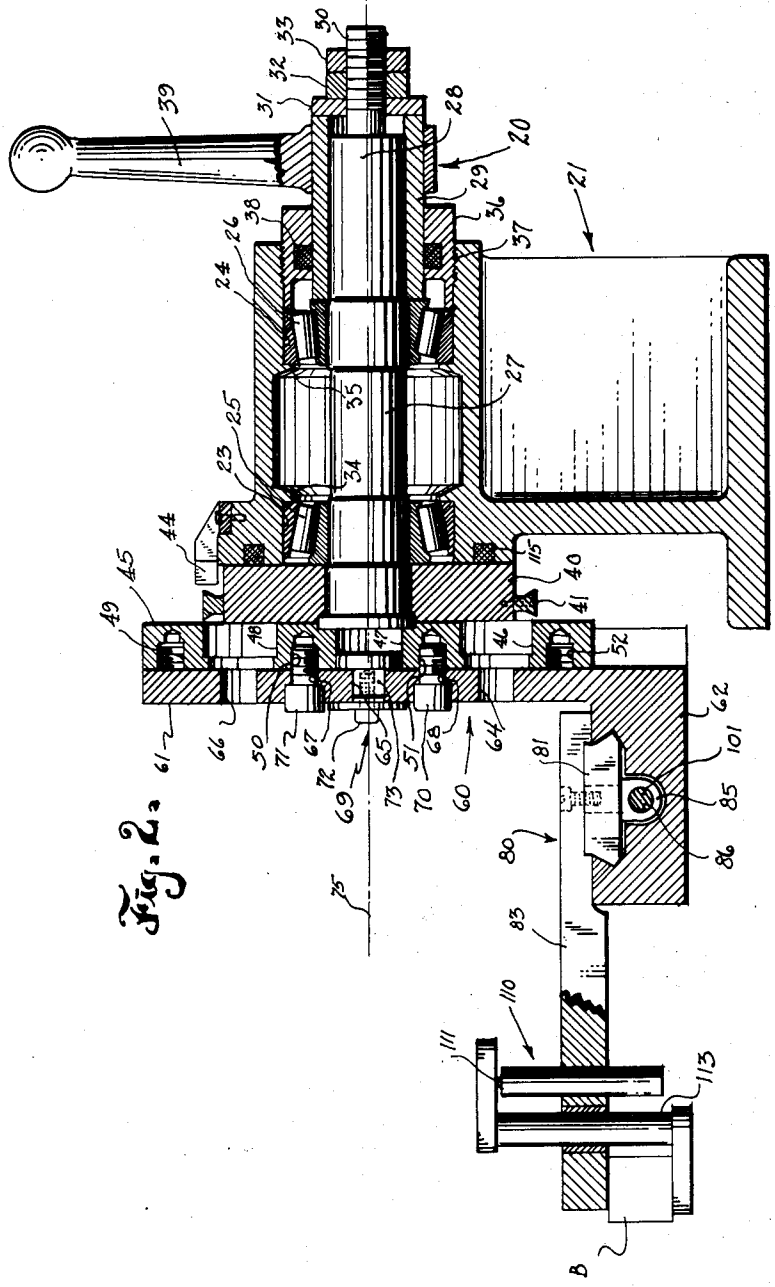


Fig. 2.

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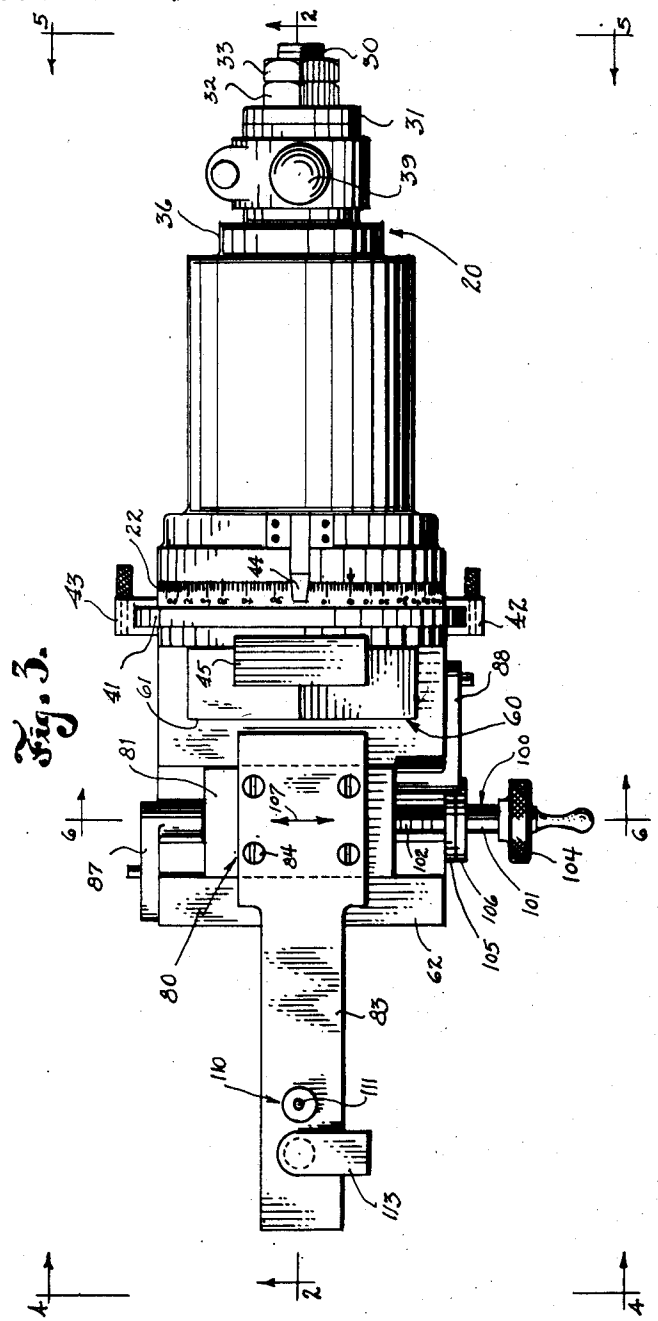


Fig. 3.

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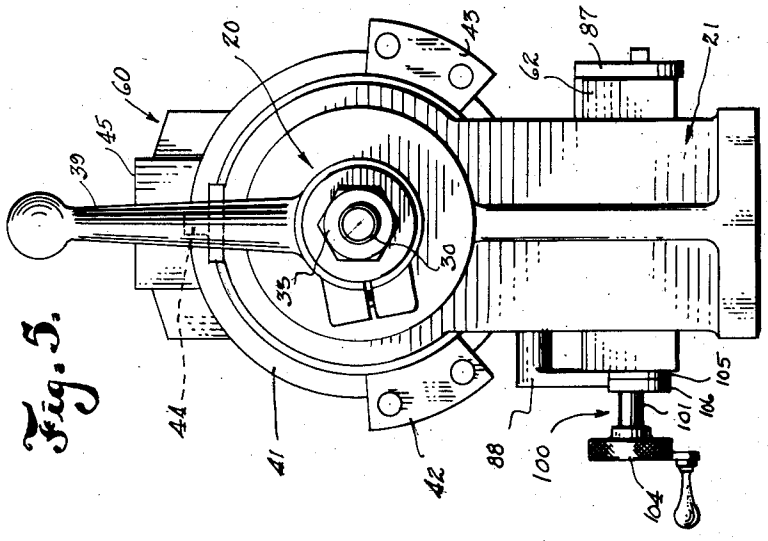


Fig. 5.

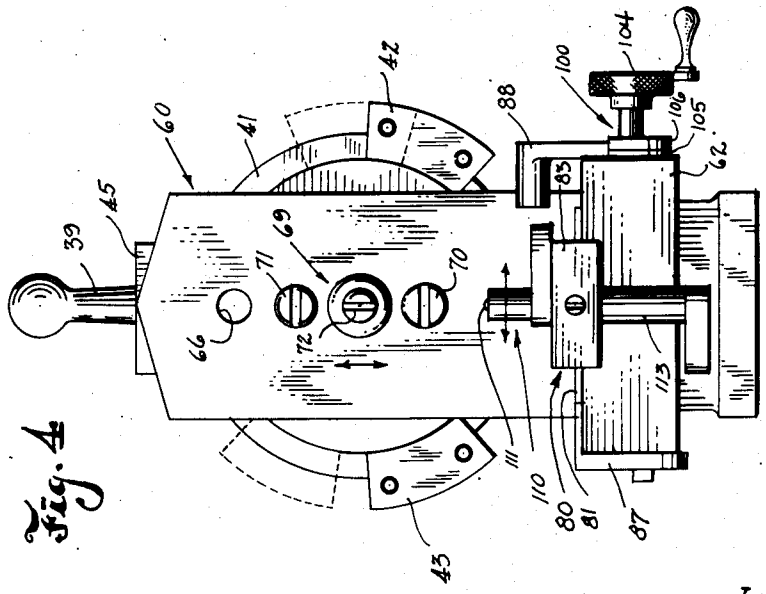


Fig. 4.

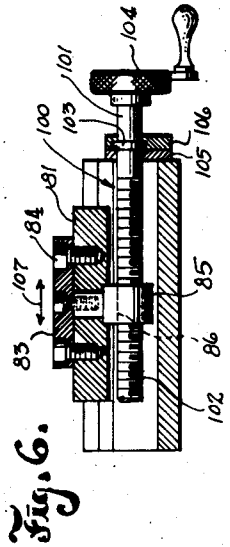


Fig. 6.

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2,642,856

ABRASIVE WHEEL DRESSER

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Application November 21, 1950, Serial No. 196,899

4 Claims. (Cl. 125—11)

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This invention relates to radii and angle dressers, and more particularly to a radii and angle dresser adapted to dress grinding wheels in any desired manner so that they may, in turn, be employed in grinding or finishing operations on other materials.

Otherwise stated, the invention is embodied in an angle tangent to radius dresser and the important feature of the dresser is that it can be utilized to dress any angle tangent to a radius on abrasive wheels.

More specifically stated, it is a general object and accomplishment to provide a dresser which cannot only grind abrasive wheels at any desired angle, but which has capacity to apply convex radii from .010" to 5" and/or 6½" concave and angles tangent to same on the working point of the abrasive wheel, this capacity being another important feature of the invention and being accomplished by adjustment means in three possible stages of operation, namely .010" to 1"; 1" to 3"; and 3" to 5".

Another aspect of the invention is to provide a form dresser by means of which an abrasive wheel may be dressed to very accurate form and dimensions, and the device being arranged so that Johansson blocks or a micrometer may be utilized to accurately set the dressing diamond.

A further object and accomplishment of the invention is to provide an abrasive wheel dresser having a carrier for a diamond tool adapted to be presented to the abrasive wheel, which carrier may be shifted to the desired position by a sliding and rotary movement manually imparted by controls operable by the user.

Another object and accomplishment of the invention is to provide an abrasive wheel dresser having a manually rotatable super-structure mounted on a base and calibrated in degrees, and with a slide carrier manually movable transversely of said rotatable super-structure and adapted to support a diamond tool by which the abrasive wheels are dressed, said carrier being adjustable with respect to the rotatable super-structure to vary the capacity characteristics of the device through three possible stages.

A feature of the invention is the provision of adjustable means adaptable to vary the capacity of the device whereby the rotatable super-structure of the device may be adjusted to various positions and angles so that the tool carrier may be moved in the direction of the adjusted angle to produce a contour on the abrasive wheel embodying faces of two or more different angles.

Another object and accomplishment of the invention is to provide an abrasive wheel dresser including a manually rotatable super-structure mounted on a base and calibrated in degrees with a first slide structure adjustably secured thereto and movable diametrically of the axis of the rotatable super-structure between three selective stages of adjustment to vary the capacity of the device, and a slide carrier manually movable transversely of the first slide structure and adapted to support a diamond pointed tool by which the abrasive wheels are dressed.

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An ancillary object and accomplishment of the invention is to provide a new and improved abrasive wheel dresser which is adapted to be economically manufactured and which is so designed as to permit the manufacture and assembly thereof in accordance with present day large scale mass-production manufacturing methods of construction and assembly.

The invention seeks, as a final object and accomplishment, to provide an abrasive wheel dresser particularly characterized by a design arrangement to more advantageously and satisfactorily perform the functions required of it and adapted to provide a compact unit which will successfully combine the factors of structural simplicity and durability, and yet be economical to manufacture.

Additional objects, features and advantages of the invention disclosed herein will be apparent to persons skilled in the art after the construction and operation are understood from the within description.

It is preferred to accomplish the various objects of this invention and to practice the same in substantially the manner as hereinafter more fully described, and as more particularly pointed out in the appended claims.

Embodiments of the invention are illustrated in the accompanying drawings forming a part hereof and wherein:

Fig. 1 is a side elevational view of an abrasive wheel dresser embodying the features of the present invention;

Fig. 2 is a sectional view of the abrasive wheel dresser depicted in Fig. 1 and being taken substantially on the plane of the line 2—2 in Fig. 3;

Fig. 3 is a top plan view of the abrasive wheel dresser depicted in Fig. 1;

Fig. 4 is a front end elevational view of the abrasive wheel dresser depicted in Fig. 1 and being taken substantially on the plane of the line 4—4 in Fig. 3;

Fig. 5 is a back end elevational view of the abrasive wheel dresser contemplated by this in-

vention and being taken substantially on the plane of the line 5—5 in Fig. 3; and

Fig. 6 is a sectional view of a portion of the slide arrangement and being taken substantially on the plane of the line 6—6 in Fig. 3.

The drawings are to be understood to be more or less of a schematic character for the purpose of illustrating and disclosing a typical or preferred form of the improvements contemplated herein and in the drawings like reference characters identify the same parts in the several views.

In the exemplary embodiment of the invention depicted in Figs. 1, 2 and 3, the abrasive wheel dresser indicated in its entirety by the numeral 10 comprises, in general, a spindle head 20 mounted on a base 21 and having means 22 calibrated in degrees to indicate the arc of rotation of a manually rotatable spindle 27; a slide 60 adjustably secured to the spindle head and movable diametrically of the axis of rotation of said spindle head between three selective stages of adjustment to vary the capacity of the device, this capacity being an important feature of the invention and being accomplished by adjustment means 69 in three possible stages of operation, namely .010" to 1", 1" to 3", and 3" to 5"; and a slide carrier 80 carried by portions of the slide 60 and having manually operable means 100 to effect controlled movement thereof transversely of said slide 60 and adapted to support a tool 110 having a diamond point 111 by which the abrasive wheels as at A (Fig. 1) are dressed.

Attention is directed to Fig. 2 wherein it can be seen that the spindle head 20 is formed to define a generally cylindrical shape and provided in the interior thereof with bearing seats 23 and 24 respectively to receive portions of roller bearings 25 and 26 which, in turn, are arranged to receive, for relative rotary motion, a spindle 27 having an end portion 28 projecting outward of the spindle head and with a collar 29 press fitted thereto, said end portion 28 having threaded formations 30 and said collar 29 being maintained in its position by virtue of the end plate 31 which is held in position by a suitable nut and lock nut respectively indicated at 32 and 33.

While the bearing 25 is maintained in position by the abutment 34, the bearing 26 is held in position by the abutment 35 and the cap 36 which has threaded formations 37 for ease of removal and provided with a preferably oil impregnated felt seal 38.

Removably carried by said collar 29 is a lever 39 effective to impart rotary movement to the spindle 27 by manual force of the operator.

At the end of the spindle 27 opposite the lever 39 there is disposed calibrated means 22 comprising an annular metallic member 40 press fitted to the end portions of the spindle so as to rotate therewith, a dovetail ring 41 carried by said metallic member 40 in encircling relationship therewith, and stop means respectively indicated at 42 and 43 adjustably carried by said ring 41 and adapted to engage an abutment 44 carried by the spindle head and effective to limit arc of rotation of said spindle. In Fig. 1, it can be seen that the stop 42 is set to permit the spindle to swing in a 60 degree arc upon manual manipulation of the lever 39. The graduations on the calibrated means 22 defining markings from 0 to 180 degrees in each direction will permit the stop means 42 and 43 to limit the arc of rotation of the spindle to any selected arc desired by the operator. An oil impregnated felt pad as at 115 is provided for lubrication purposes.

Fixedly secured to said annular metallic member 40 is a mounting bar 45 formed of rectangular shape and having three equi-distantly longitudinally spaced apertures respectively indicated at 46, 47 and 48, and four threaded openings 49, 50, 51 and 52. Thus, it can be seen that this bar will rotate with the spindle 27 because the annular metallic member 40 is press fitted to the spindle and the mounting bar 45 is secured to the annular metallic member 40.

Carried by said mounting bar is the slide 60 having a vertically extending rectangularly shaped face plate 61 with a depending outwardly projecting leg 62, and said face plate having three through apertures 64, 65 and 66 equispaced and respectively registering with the apertures 46, 47 and 48 and with two through openings 67 and 68 respectively registering with the openings 50 and 51.

In order to vary the capacity of the device the slide 60 is adapted for movement diametrically of the spindle head to three possible stages to permit the diamond pointed tool 80 to swing in arcs of different radii, namely .010" to 1", 1" to 3", and 3" to 5", the device as shown in Figs. 1, 2 and 4 being set for the middle stage, that is to say, to swing in arcs having radii of 1" to 3". The procedure to be followed in varying the radii of any one stage will be hereinafter discussed in detail.

In order to set the device for another of the two remaining stages, for example, for arcs having radii 3" to 5", the adjustment means 69 comprising screws 70 and 71 respectively disposed for the central stage in the openings 51—68 and 50—67 are removed and the screw 72 is removed from the insert 73 and thus the slide 45 may be moved downwardly so that the insert will register in the aperture 66 which will then become the axis of the arc and the openings 67 and 68 will respectively register with the openings 51 and 52 whereupon the screw 72 may be replaced in the insert 73 and the screws 70 and 71 may be respectively replaced in the new registered openings 68—52 and 67—51.

For arcs having radii of .010" to 1" the process is repeated but the slide 60 is moved upwardly where the apertures and openings will find new registrations.

Thus, the axis of rotation 75 will remain on the same plane but the distance between the axis and the diamond point 81 can be varied as aforesaid, thereby to provide a range of arcuate movement heretofore not found in any abrasive wheel dressers of the prior art.

Attention is now directed to Figs. 1, 2, 3, 4 and 6 wherein there is illustrated the details of the carrier slide 80 and the manually operable adjustment means 100 to effect controlled movement of said carrier slide 80 transversely of said slide 60.

The carrier slide 80 comprises a dovetail rectangular shaped block 81 adapted for transverse sliding movement in a groove in the leg 62 of the slide 60, and an outward extending arm 83 fixedly secured to said block 81 by screws as at 84 and adapted to support the diamond pointed tool 110 as shown. Carried by said block 81 is a cylindrically shaped member 85 (Fig. 6) having a threaded through aperture 86.

The adjustment means 100 comprises a shaft 101 having a threaded portion 102 and a collar

103 and a hand crank 104, said threaded portion 102 being adapted to be received into the threaded through aperture 86 (Fig. 6) of the member 85 and the collar being clamped between blocks 105 and 106 to prevent axial movement of the shaft 101. Thus it can be seen that when the crank 104 is turned, the block 81 will be caused to move in either direction indicated by the arrows 107 (Fig. 6) depending on which way the crank is turned.

The transverse movement of the block 81 facilitates movement of the diamond tool transversely of the movement effected by the slide 60 and on a plane tangent to a radius of arcuate movement of the diamond tool 110 effected by manual manipulation of the lever 39.

Stop means 87 and 88 are disposed at each side of and movable for engagement with the block 81 in order to advantageously limit the transverse movement of the block in certain operations. In Figs. 3 and 4 it can be seen that the stops 87 and 88 are pivotally mounted on the sides of the leg 62 of the slide 60 and that the stop 87 is in its lowered position in engagement with end portions of the block 81 while the stop 88 is in the raised or out-of-engagement position. Thus, the block 81, as shown in Fig. 4, can only be moved to the right and back again to the limits dictated by the stop 87. If both stops are lowered the block 81 will be held in the center line position.

Attention is now invited to the diamond pointed tool 110 depicted in Figs. 1 and 2 wherein it can be seen that the tool is carried by the arm 83 and may be moved upwardly or downwardly after one loosens the set screw 112. This is accomplished for the purpose of adjustment to a desired radius within the range of any stage hereinbefore described. For example, if the slide 60 is set for the central stage as shown in Figs. 1 and 2, the range of radii of the arcuate movement of the diamond tool 110 will be 1" to 3" and any particular radius within this range may be had by adjustment of the tool 110.

In order to provide accurate adjustment of the tool 110 for any selected radius Johansson blocks as at B may be employed, as shown, in conjunction with the bar adjustment means 113 which may be moved to the dotted line position to accomplish adjustment and thereafter may be moved aside to the full line position as shown in Fig. 1.

From the foregoing disclosure, it may be observed that I have provided an improved abrasive wheel dresser which efficiently fulfills the objects thereof as hereinbefore stated and which provides numerous advantages which may be summarized as follows:

1. Structurally simple, efficient and durable;

2. Economical to manufacture and readily adapted to mass-production manufacturing principles; and

3. The provision of an angle tangent to radius dresser which can be utilized to dress any angle tangent to a radius on abrasive wheels to very accurate form and dimensions, and which has the important feature of adjustment to vary the capacity thereof between three selective stages.

While I have illustrated preferred embodiments of my invention, many modifications may be made without departing from the spirit of the invention, and I do not wish to be limited to the precise details of construction set forth but wish to avail myself of all changes within the scope of the appended claims.

I claim:

1. An abrasive wheel dresser comprising: a support base; a spindle rotatably mounted in said base; means including a lever secured adjacent to one end of said spindle to facilitate manual rotation of said spindle; an annular member secured to the end of said spindle opposite said lever, said annular member being rotatable with said spindle responsive to manual actuation of said lever; means calibrated in degrees on the periphery of said annular member for indicating the arc of rotation of said spindle; means for restricting rotation of said spindle within predetermined limits including a ring member carried by the periphery of said annular member and rotatable therewith, a pair of stop members slidably carried by said ring member for manual movement to predetermined selected positions to define the limits of rotation of said spindle, and a stationary stop member carried by said support base and engaged by said movable stop members responsive to manual actuation of said lever to positions defined by the limits of rotation of said spindle; a mounting bar fixedly secured to said annular member and rotatable therewith, said mounting bar being of substantially rectangular shape and having three equi-distantly longitudinally spaced apertures; a slide adjustably carried by said mounting bar and movable diametrically of the axis of rotation of said spindle between three selective stages of adjustment to vary the capacity of the dresser, said slide having three equi-distantly spaced apertures corresponding to said apertures in said mounting bar; an insert disposed in one of said apertures in said mounting bar, and a screw threaded member disposed in an aperture of said slide and a portion of which is adapted for receipt into said insert for maintaining said slide and mounting bar in one of said three selective stages of adjustments; a slide carrier slidably carried by said slide; an arm fixedly secured to said slide carrier for movement therewith, said arm projecting from said slide carrier in a direction transversely of the sliding movement of said slide carrier; a tool removably carried by said arm; and means including a set screw retaining the disposition of said tool with respect to said arm.

2. An abrasive wheel dresser comprising: a support base; a spindle rotatably mounted in said base; means including a lever secured adjacent to one end of said spindle to facilitate manual rotation of said spindle; an annular member secured to the end of said spindle opposite said lever, said annular member being rotatable with said spindle responsive to manual actuation of said lever; a mounting bar fixedly secured to said annular member and rotatable therewith, said mounting bar being of substantially rectangular shape and having three equidistantly longitudinally spaced apertures; a slide adjustably carried by said mounting bar and movable diametrically of the axis of rotation of said spindle between three selective stages of adjustment to vary the capacity of the dresser, said slide having three equi-distantly spaced apertures corresponding to said apertures in said mounting bar; an insert disposed in one of said apertures in said mounting bar, and a screw threaded member disposed in an aperture of said slide and a portion of which is adapted for receipt into said insert for maintaining said slide and mounting bar in one of said three selective stages of adjustment; a slide carried by said slide; an arm fixedly secured to said slide carrier for movement therewith, said arm

projecting from said slide carrier in a direction transversely of the sliding movement of said slide carrier; and a tool removably carried by said arm.

3. In an abrasive wheel dresser comprising a base support, a spindle rotatably mounted in said base, means including a lever secured adjacent to one end of said spindle to facilitate manual rotation of said spindle, and an annular member secured to the end of said spindle opposite said lever, said annular member being rotatable with said spindle responsive to manual actuation of said lever: the combination with a mounting bar fixedly secured to said annular member and rotatable therewith, said mounting bar being of substantially rectangular shape and having three equi-distantly longitudinally spaced apertures, of a slide adjustably carried by said mounting bar and movable diametrically of the axis of rotation of said spindle between three selective stages of adjustment to vary the capacity of the dresser, said slide having three equi-distantly spaced apertures corresponding to said apertures in said mounting bar, an insert disposed in one of said apertures in said mounting bar, a screw threaded member disposed in an aperture of said slide and a portion of which is adapted for receipt into said insert for maintaining said slide and mounting bar in one of said three selective stages of adjustment, a slide carrier slidably carried by said slide, manually operable means including a crank carried by said slide and connected to said slide carrier effective to move for controlling movement of said slide carrier transversely of said slide, stop members carried by said slide and manually movable for engagement with respective end portions of said slide carrier to define the limits of movement of said slide carrier with respect to said slide, an arm fixedly secured to said slide carrier for movement therewith, said arm projecting from said slide carrier in a direction transversely of the sliding movement of said slide carrier, and a tool removably carried by said arm.

4. In an abrasive wheel dresser comprising

a support base, a spindle rotatably mounted in said base, means including a lever secured adjacent to one end of said spindle to facilitate manual rotation of said spindle, an annular member secured to the end of said spindle opposite said lever, said annular member being rotatable with said spindle responsive to manual actuation of said lever: a mounting bar fixedly secured to said annular member and rotatable therewith, said mounting bar being of substantially rectangular shape and having three equidistantly longitudinally spaced apertures; a slide adjustably carried by said mounting bar and movable diametrically of the axis of rotation of said spindle between three selective stages of adjustment to vary the capacity of the dresser, said slide having three equi-distantly spaced apertures corresponding to said apertures in said mounting bar; an insert disposed in one of said apertures in said mounting bar, and a screw threaded member disposed in an aperture of said slide and a portion of which is adapted for receipt into said insert for maintaining said slide and mounting bar in one of said three selective stages of adjustment.

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References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,408,305	Maynard	Feb. 28, 1922
1,907,065	Halborg	May 2, 1933
1,994,386	Dardani	Mar. 12, 1935
2,137,140	Lewis	Nov. 15, 1938
2,327,272	Jones	Aug. 17, 1943
2,343,949	Bellinger	Mar. 14, 1944
2,395,598	Weaver	Feb. 26, 1946
2,436,873	Sneva	Mar. 2, 1948

FOREIGN PATENTS

Number	Country	Date
575,303	Great Britain	Feb. 12, 1946