May 29, 1951 J. L. HOSINSKI 2,554,530

RADIUS AND TANGENT DRESSER FOR ABRASIVE WHEELS

Filed May 10, 1948 2 Sheets-Sheet 1

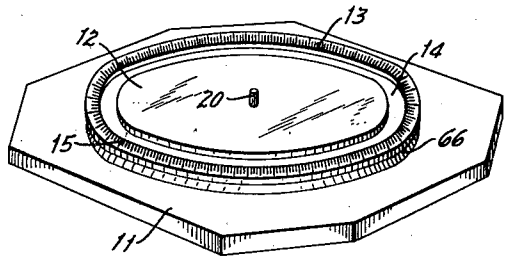


Fig. 9.

Fig. 1.

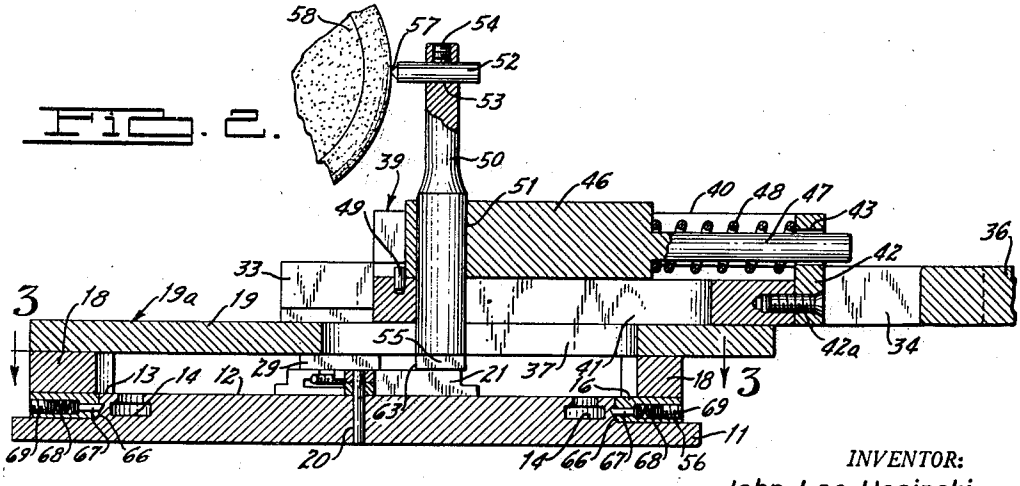


Fig. 2.

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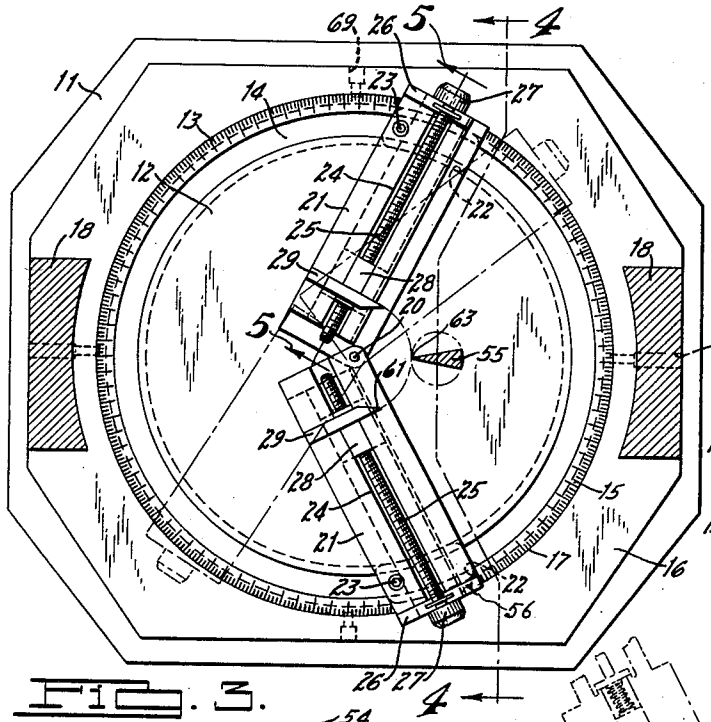


Fig. 3.

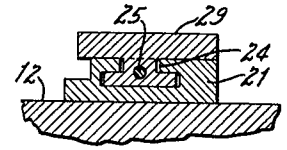


Fig. 6.

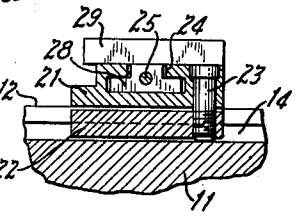


Fig. 7.

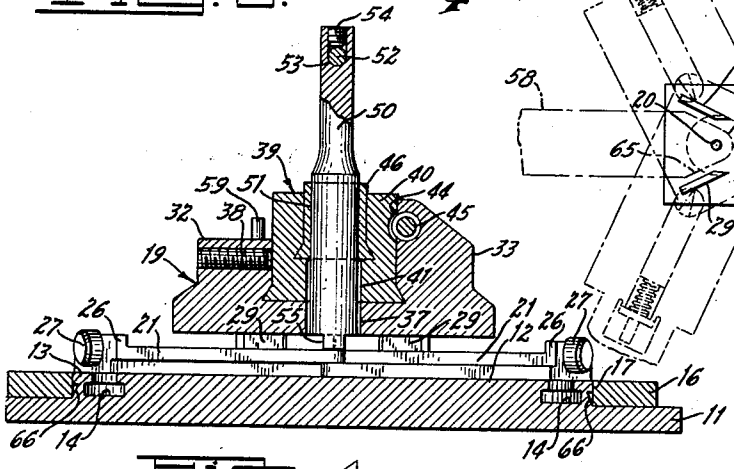


Fig. 4.

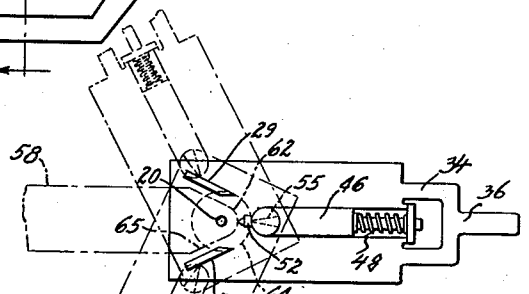


Fig. 8.

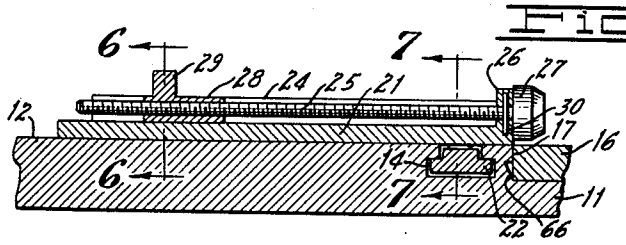


Fig. 5.

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2,554,530

RADIUS AND TANGENT DRESSER FOR ABRASIVE WHEELS

John Leo Hosinski, Detroit, Mich.

Application May 10, 1948, Serial No. 26,193

4 Claims. (Cl. 125—11)

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My invention pertains, generally, to a dressing device for abrasive wheels, the object of my improvement being to provide a device by means of which a wheel may be dressed in one continuous operation, first to a radius and then to a tangent. While a number of dressers have already been patented and a number of them are already on the market; and, while it is possible by means of them to dress an abrasive wheel to a radius and then to a tangent, in all of these cases, as far as the applicant is aware, it is necessary first to complete a radius-dressing operation, whereupon the operation of the device has to be interrupted in order that it may be adjusted to dress the wheel to a tangent.

Aside from the time element required in setting the dresser, the interruption of the operation of the device results often in a nick or an annular groove in the abrasive wheel. This danger is eliminated by the continuity of operation by means of my improved device. Otherwise, said device is capable of all ordinary operations of which the conventional dressers are capable, and includes means whereby the dimensions of the radii and the angles of the tangents with respect to the plane of rotation of the abrasive wheel may be determined accurately.

A further object of my invention is to provide a device of this short without making it too complicated or too cumbersome.

I shall now describe my improvement with reference to the accompanying drawings in which:

Figure 1 is a perspective view of my device as set for operative use;

Figure 2 is a sectional view of my device on line 2—2 of Figure 1;

Figure 3 is a horizontal, sectional view of my device taken on line 3—3 of Figure 2;

Figure 4 is a sectional view of my device taken on line 4—4 of Figure 3;

Figure 5 is a sectional view of a detail of construction taken on line 5—5 of Figure 3;

Figure 6 is a sectional view of component members of my device taken on line 6—6 of Figure 5;

Figure 7 is a sectional view of component parts of my device taken on line 7—7 of Figure 5;

Figure 8 is a diagrammatic view of the positions of the elements of my device in different operative positions;

Figure 9 is a perspective view of the base of my device;

Similar numerals refer to similar parts throughout the several views.

The device, best shown in its entirety in Figure 1 where it is disclosed as resting on a supporting table 10, includes a flat base 11, substantially hexagonal in shape. The base includes a centrally located disc 12, said disc rising above the surface of said base and being surrounded by a flat ring 13 which reaches up to the level of the disc. The space between the disc 12 and the ring 13 forms a T-slot 14, as shown in Figures 4 and 5. The surface of the ring, along its periphery, is provided with calibrations 15 in degrees as shown in Figures 1 and 3.

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Mounted upon said base 11 is a turntable 16, also hexagonal in shape, its sides being aligned with the sides of said base. The turntable has a centrally located, circular aperture 17 which is large enough to fit over said ring 13 as best shown in Figures 1 and 4. Two spacing blocks 18, disposed diametrically on said turntable 16, support a platform 19 with a slideway 19a rising therefrom and being integrally formed therewith. Radially disposed under said platform 19 and resting partly on disc 12 and partly on ring 13, are two arms or beams 21 pivotally connected to each other by means of an upright pin 20, centrally located within said disc as best shown in Figure 2. At the portion where each beam crosses slot 14, it is connected, on its underside, to a key 22 in the shape of an inverted letter T and fitting into said slot 14. A screw 23, disposed within each beam 21 and passing through its key, serves to draw the key upwardly against the abutting lateral upper surfaces of slot 14 to secure the beam in place against movement along the arcuate path in said slots 14. Each beam is provided with an oblong T-slot 24 and contains therein a longitudinally disposed screw 25 which, at its outer end, passes through a shoulder 26 rising upwardly from each beam at the outer end thereof. At its inner end, each screw 25 is threaded through a sliding member 28, which includes a transversely disposed tangent guide 29, made in the form of a short beam, rising above the upper surface of said beam 21. The screw 25 is provided with a head 27 by means of which it may be rotated around its axis. A washer 30, mounted on the neck portion of the screw within slot 31 in shoulder 26, where said screw is devoid of threads, prevents longitudinal movement of the screw with respect to said shoulder 26.

Now I shall revert to the platform 19 and the slideway 19a mounted thereon. The slideway 19a is a flat-bottomed member having cut in its upper portion a straight-line way, the formation including two walls 32 and 33, respectively, as best shown in Figure 4. Affixed to what is the outer

end of said walls is a U-shaped extension 34 secured to said walls by means of screws located within holes 35. A handle 36, attached to the cross member of said U-bar, serves as a means of rotating the turntable with the slideway thereon around the axis of the disc. To complete the description of the slideway, I wish to add that it is provided with an oblong slot 37 opening downwardly towards said disc 12.

Disposed within the slideway is a slide 39, this being a trough or channel-shaped member, the formation including two parallel, upright walls 40, the bottom of the channel formation being provided with an oblong slot 41 opening towards the above-mentioned slot 37 and towards the disc 12. At the end adjoining said U-shaped extension 34, the slide is provided with a head plate 42 secured to the walls by means of screws 38. The head plate 42 includes an aperture 43, the purpose of which will be described presently.

The outer surface of one of walls 40 includes an integrally formed rack 44 for engagement with driving screw 45, the arrangement serving for the purpose of moving the slide 39 longitudinally within said slideway 19*a*. Located within the interior space or slide 39, that is between walls 40, is a slide block 46, the block having integrally connected thereto a stem 47 which extends rearwardly therefrom and passes through the above-mentioned aperture 43. The stem is intended as a supporting means for a coiled spring 48 which bears against block 46, urging it outwardly in the opposite direction, that is, towards the operative end of the device. Its progress in that direction is checked by a stop pin 49 disposed vertically within the front part of said slide 39. A standard 50, mounted within a vertical aperture 51 in the slide block 46, passes downwardly through slot 41 in slide 39 and slot 37 in the slideway 39*a*. At its upper portion, the standard is provided with a socket 53 for reception of a diamond holder 52 which is kept in place by means of a set screw 54 placed in the top of said standard and bearing against the holder from above. The holder is set in the standard in such a manner that the tip 57 of the diamond mounted in the holder is vertically aligned with the axis of pin 20 which, as above indicated, is located in the center of disc 12 of the base of my dresser.

In practice, the distance to which the tip of the diamond projects in the direction of the abrasive wheel is set with reference to a pin 59 mounted on top of wall 32, as a straight line drawn at right angle to said wall 32 across said pin 59 would also pass through the axis of pin 20.

At its lower end, the standard 50 terminates in a horizontally disposed V-shaped finger 55 as best shown in Figures 2 and 3. The tip of the finger, being confined within the circular, cross-sectional outline of standard 50, is set rearwardly of the tip of the diamond to a pre-determined distance, said tip, marked 63, being shown best in Figure 3. If preferred, a slight change in the structure of the dresser might be made so as to have the tip of the diamond aligned vertically with the tip of finger 55. This may be accomplished by either setting diamond holder 52 rearwardly within its standard or by having a finger extending radially beyond the circular, cross-sectional outline of standard 50 in the direction of the abrasive wheel.

To complete my description, I wish to add that, for the purpose of ascertaining the distance of the movement of slide 39 with respect to slideway 19*a*, I have provided the slide with a horizontally disposed pin 60 and, in order to retain the slide 39 in its operative position against longitudinal movement, I am using a set screw in wall 32, said set screw being indicated by numeral 38. The abrasive wheel is indicated by numeral 58.

In order to prevent displacement of the turntable 16 from the base on which it rests, ring 13 has an annular undercut 66 for engagement of a pin 67 which is under the tension of a coiled spring 68 in an aperture 56 horizontally disposed in the rim of the turntable, said coiled spring being secured in place by means of a threaded plug 69.

I shall now describe the operation of my device. It will be understood that the device is to be placed on a table in such a position with respect to an abrasive wheel to be dressed that the sliding block 46 in slideway 39 will be disposed at right angle to the arbor supporting said abrasive wheel, and that the diamond-enclosing holder 52 is at the level of the axis of said arbor. The holder itself is set in place in such a manner that the tip of the diamond 57 is in line with the axis of pin 20 located centrally within disc 12 upon base 10. This is what may be called the zero position of the diamond tip.

It will also be understood that table 10, itself, may be adjusted properly for the operative position of the dresser. Assuming that the wheel is to be dressed to a convex radius of length "*a*", first the set screw 38 is to be loosened in order that slide 39 may be moved from index pin 59 in the direction away from the wheel so that the diamond tip may be moved the required distance "*a*" from its zero position as computed with respect to said pin 59. This may be done by means of the rack and screw arrangement, 44 and 45 respectively, whereupon the slide may be locked in place by means of set screw 38. Assuming now that the tip of the diamond is in operative engagement with the periphery of the abrasive wheel as it rotates around its axis, all that is required to dress the wheel to a convex "*a*" radius is to cause the diamond tip to move in an arc which may be done by swinging the whole turntable 16 around its axis by means of handle 36.

It will be remembered that, while slide 39 is moved back, the slide block 46 remains in the same position with relation to said slide 39 as its movement forwardly towards the grinding wheel is blocked by means of stop pin 49.

Assuming now that, in addition to the radius, the wheel is to be dressed to a tangent, this may be accomplished with the aid of arms 21 pivoted upon pin 20. This is effected in the following manner: First, said arms are swung along an arcuate path until they are spread apart to a desired angle from a median line passing through the center of standard 50. The degrees may be ascertained by means of calibrations 15 on ring 13, said calibrations to be read with respect to a mark 56 placed on said arm and aligned with tip 61 on tangent guide 29. To prevent the movement of the arms within slot 14, in an arcuate path therein, each of said bars is secured in place by means of the tightening of screw 23. Next, the tangent guide 29 is adjusted longitudinally within oblong slot 24 to set said guide bar to a distance from the center of pin 20 which corresponds to the dimension of the selected radius plus the distance from the tip of the diamond to the tip 63 of finger 55. This is necessary, as the tip 63 of said finger is set back of the tip 57 of the diamond. All that is now necessary is to

swivel the platform 19 with the slideway 19a on the turntable 16 by means of handle 36. The diamond will follow an arcuate path 62 which is best shown in a dotted line in a diagrammatic presentation in Figure 8, the path of the finger tip will describe a concentric arc, shown in dotted lines 64.

The initial position of the slideway 19a with the initial position of the block carrying standard 50 and the V-finger at the lower end of said standard, indicated by numeral 55, is shown in solid lines in Figure 8. When the turntable 16 has been sufficiently swung around its axis, say, downwardly as shown in Figure 8, tip 63 of V-finger will encounter tangent guide 29 and, as the outer surface of said tangent guide extends beyond the radius for which the diamond is set by means of slide 39, said tip 63 being brought against the side of guide bar 29, will be pushed backwardly, together with the diamond holder 52, against the tension of spring 48 in slide 39.

In other words, what will happen is this: First, the diamond point will describe an arc to a predetermined radius, then, as the turntable is swung around its axis, the V-point at the base of standard 50 will encounter the outer side of the tangent guide 29. While the rotary movement of the turntable is continued, said V-point will be guided by the outward side of said guide 29 so that the slide block will be pushed rearwardly against the tension of spring 48 so that said standard will define a straight line, this being the tangent to the radius described by the diamond.

Although up to this time I have confined myself to the description of the operation of my device with respect to dressing a convex radius, it will be understood that the use of the device is not limited to that function alone, but that my device may also be used to dress a wheel to a concave radius. In order to accomplish this, all that is needed is to move the slide 39 in its slideway so as to carry block 46, with standard 50 therein supporting a diamond point 57, past the center pin 20. As illustrated in Figure 1, this operation may best be visualized with respect to the horizontal pin 60 in relation to the upright pin 59, as, in the movement of the slide 39 forwardly, said pin 60 would come towards said pin 59. If necessary, it might even be feasible to remove said pin 59 which, otherwise, might be in the way of said pin 60.

It will also be understood that, in order to have the diamond point follow a tangent to a concave radius, some slight changes would have to be made in the construction of my dressing device, this being confined mainly to the relation of spring 48, block 46, slide 39 and slideway 19a; but these changes are not described here, nor is a structure of this type claimed.

It will be obvious that some changes may be made in the construction of my improvement without deviating from the inventive principles disclosed herein.

What I, therefore, wish to claim is as follows:

1. A wheel dresser of the kind described, comprising a base, a turntable mounted thereon, a U-shaped slideway diametrically disposed on the turntable, in a spaced relation thereto, said slideway having in its bottom an oblong slot extending diametrically with respect to said turntable, a U-shaped slide longitudinally movable within the slideway and having a slot therein in register with the slot in the slideway, a sliding block within the slide, spring means bearing against the block from one end of the slide, a check pin

mounted within the slide to limit the movement of the block at the other end, a vertical standard mounted in the block at the end remote from the spring, the standard having, at its upper end, means for retention of a diamond dressing point, the body of the standard extending downwardly through the slot in the slide and terminating in a horizontally disposed, V-shaped finger turned towards the operative point of the diamond, a pin centrally disposed on the turntable, two arms pivotally connected thereto at one end and extending radially therefrom, each arm having a slideable cross bar forming a tangent guide, the arms being adapted to be set at any angle to each other, and the tangent guide being adapted to be moved longitudinally upon the arms, for operative contact with the tip of the V-shaped finger, to guide the standard along a tangent to a radius described by the diamond.

2. A wheel dresser of the kind described, comprising a base, a turntable concentrically mounted thereon, said turntable including two diametrically disposed blocks rising therefrom along the periphery thereof, a U-shaped slideway resting on said blocks in a spaced relation to the turntable, said slideway having in its bottom an oblong slot extending diametrically with respect to said turntable, a U-shaped slide within said slideway, one side of said slide being provided with a rack, a screw supported by the slideway for engagement with said rack to move said slide longitudinally within said slideway, the slide having an oblong slot in its bottom in register with the slot in the slideway, a sliding block within the slide, spring means bearing against the block from one end, a check pin within the slide to limit the movement of the block at the other end, a vertical standard mounted in the block at the end remote from the spring, the standard having, at its upper end, a horizontal holder, a diamond within the holder, the diamond being pointed for wheel dressing, the body of the standard extending downwardly through the slots in the slide and in the slideway, respectively, and terminating in a horizontally disposed, V-shaped finger pointing in the direction of the diamond, a pin centrally disposed on the turntable, two horizontal arms pivotally connected thereto, at one end, and extending radially from said pin, the arms being adapted to be set at any desired angle to each other, a slideable cross bar upon each arm, screw means within each arm to move the cross bar thereon longitudinally for operative contact with the tip of the V-shaped finger, to guide the standard along a tangent to a radius described by the diamond.

3. A dresser for abrasive wheels, said dresser comprising a flat base including a flat ring rising above the upper surface thereof and provided on top with calibrations in degrees, a turntable mounted on the base, said turntable having a circular, central opening skirting said ring and two diametrically disposed blocks rising above its upper surface, a U-shaped slideway resting on said blocks above said turntable, the slideway having in its bottom an oblong slot extending diametrically with respect to said turntable, a U-shaped slide within said slideway, one side of said slide being provided with a rack, a screw supported within the slideway for engagement with said rack to move said slide longitudinally within said slideway, the slide having an oblong slot in its bottom in register with the slot in the slideway, a sliding block within the slide, spring means bearing against the block from one end, a check pin

within the slide to limit the movement of the block at the other end, a vertical standard mounted in the block at the end remote from the spring means, the standard having, at its upper end, a holder with a diamond point for wheel dressing, the body of the standard extending downwardly through the slots in the slide and in the slideway, respectively, and terminating in a horizontally disposed, V-shaped finger pointing in the direction of the diamond holder, a pin rising vertically from the center of the base, two horizontal arms pivotally connected thereto at one end and extending radially from said pin across the surface of the ring, each arm being provided with a longitudinal slot therein, the arms being adapted to be set at any desired angle to each other, a slideable cross bar mounted on each arm, screw means within each arm to move the bar thereon for operative contact with the tip of the V-shaped finger, to guide the standard along a tangent to a radius described by the diamond.

4. A dressing device for an abrasive wheel, said device comprising a vertical standard having therein a horizontal holder with a diamond tip, a block upon which the standard is mounted, a straightway slide for the block, spring means within said slide, urging the block forwardly in the operative direction of the diamond, and a stop pin at the front end of the block to limit the forward movement of the block, a slideway supporting the slide extending in the direction thereof and mounted on a horizontal, rotary turntable, in a diametrical relation thereto, a flat base under said turntable and two spacing blocks

between the base and the turntable to keep said turntable in a spaced relation to the base, two straight-line arms pivotally connected to each other at one end and extending from a point below the center of the turntable radially outwardly, a straight-line cross bar slideably disposed on each arm, screw means within each arm to adjust the distance of the cross bar thereon with respect to the center of the turntable rack means upon the slide and a screw mounted upon the slideway for engagement with said rack, means to move longitudinally the slide for adjustment of the position of the tip of the diamond with respect to the center of the turntable, a handle on the slideway to rotate the turntable including said standard with the diamond-tip point therein to a desired radius and for engagement of the standard with the cross bars for movement of the iamond to a tangent to said radius.

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