The present invention relates to grinding wheel dressers, and more particularly, to a dresser for imparting an involute form to the periphery of the grinding wheel.

The primary object of the invention is to provide a grinding wheel dresser having the various parts thereof so correlated as to cause the dressing tool to traverse a true involute curve and thereby generate a grinding wheel surface having a corresponding involute peripheral surface.

Another object of the invention is to provide an involute form dresser for grinding wheels in which the dresser may be reversed so that both sides of the wheel adjacent the periphery thereof may be cut to form and generate an involute curved surface without requiring extensive measurements and compilations with respect to the two positions of operation.

Another object of the invention is to provide an involute form dresser for surfacing the peripheral edge of grinding wheels in which the dresser is supported between a pair of opposed axially aligned centers to maintain a true relationship with respect to the grinding wheel.

Another object of the invention is to provide an involute form dresser for grinding wheels in which the dresser is supported between a pair of opposed axially aligned centers to maintain a true relationship with respect to the grinding wheel.

Another object of the invention is to provide an involute form dresser for grinding wheels in which the dressing tool may be adjusted to various positions so as to permit the dressing tool to be used for forming involute curve surfaces for various diameter gears without requiring the alteration of the dressing tool except for a minor adjustment to the cutting tool thereof.

Another object of the invention is to provide an involute form dresser which may be supported between the centers of a grinding machine so as to position the cutting tool directly beneath the periphery of the grinding wheel, thereby aiding in maintaining a direct relationship between the involute form dresser and a fixed reference point.

Another object of the invention is to provide an involute form dresser of the above-mentioned character which may be quickly and easily adjusted so as to enable the involute dresser to be used in dressing grinding wheels with a large number of involute forms depending upon the diameter of the gear and the required involute tooth form.

Another object of the invention is to provide an involute form dresser for grinding wheels in which all of the parts are so fitted and correlated as to provide a dresser which will inscribe an involute form with a high degree of accuracy and precision.

Other objects and advantages will become apparent during the course of the following description of the accompanying drawings, wherein:

Figure 1 is a top plan view of the involute form dresser illustrating portions thereof broken away to show various details of construction and the arrangement of parts;

Figure 2 is an end elevational view of an involute form dresser illustrating the same in its normal position presented directly beneath a grinding wheel to be formed;

Figure 3 is a vertical cross sectional view taken on the zig-zag line 3—3 of Figure 1 looking in the direction of the arrows and illustrating the manner in which the dresser is rotated to inscribe an involute curve and provide a corresponding contour surface on the periphery of the grinding wheel;

Figure 4 is a vertical cross sectional view taken on the irregular line 4—4 in Figure 2 looking in the direction of the arrows, illustrating the various structural details of the involute form dresser and the arrangement and relation thereof between the centers of a grinding machine;

Figure 5 is a diagrammatic view of the dressing cutter illustrating the manner in which the same is moved along an involute curve to generate a corresponding contour surface on the periphery of the grinding wheel;

Figure 6 is an enlarged fragmentary side elevational view showing the various structural details of the slide supporting brackets; and

Figure 7 is a cross sectional view taken on the diagonal line 1—1 in Figure 5 looking in the direction of the arrows and illustrating in detail the pivot connection between the adjustable slide bar and the movable rack member.

In the drawing, Figures 1 and 4 show a grinding machine having a rigid frame, a portion only being shown. Mounted upon the machine frame 4 are conventional opposing center supports 5 and 6. The center supports 5 and 6 are provided with the usual centers 1 and 3 and are shown in Figures 2, 3, and 4 directly beneath a grinding wheel 12. The above structure is typical of a grinding machine having center supports for supporting work or the like and the grinding wheel 12 is movable vertically with respect to said supports so that the grinding wheel may be fed toward and away therefrom.

The invention comprises an involute form dresser generally designated by the reference character 10 and said involute form dresser comprises a casing structure generally indicated as at 11 for being supported between the centers 1 and 8 of the above-mentioned grinding machine. The casing structure 11 comprises a frame section including a front wall plate 12 having angular end portions 13 and 14. The end wall...
portion 14 is slightly offset as at 15 and said angular end portions 13 and 14 are connected by a plate section 16 fastened in place at its ends by means of machine screws or the like as at 17. Projections 18 may be formed on the free edges of the angular end walls 13 and 14 so as to be received in rectangular notches 19 formed in the connecting plate 16 thereby preventing relative sliding movement between the casing section and the plate member 16.

Fitted on the center support and center 1 is a collar 20 adapted to be held in place by a set screw 21 and said collar is provided with a flat surface 22 and an angular end 23 as indicated in Figure 4 may be inserted as at 23, the block 23 being seated upon a rigid portion of the machine frame 4 so as to hold the center support 5 and collar 20 against rotation and provide a substantially rigid and solid support. The collar 20 is provided with a reduced annular boss 24 for being received in an opening 25 in the plate member 16 and said plate member is positioned on said annular boss 24 in such a manner as to be rotatable thereon about the axis of the center 7 and 9.

Formed integral with the front wall 12 of the frame section is a tubular extension 26 having a bore 27 adapted to receive a tubular extension 28 formed on the collar 20. In assembling the parts, the tubular extension 26 is telescoped over the tubular extension 28 with the tubular extension 25 rotatably mounted on the tubular extension 28 so as to further increase the supporting surface for the involute form dresser and maintain the parts in their assembled relation.

Fitted on the tubular extension 28 is the hub portion 29 of a sector gear 30 and said hub portion is rigidly affixed to the collar 20 by means of machine screws or the like as at 31. The heads of the machine screws are received in countersunk bores 32 so as to provide adequate clearance for the rotation of the tubular extension 28 on the tubular extension 26. Gear teeth 33 are formed on the sector gear 30 and it is to be noted that the sector gear 30 is held in a rigid position against rotation due to the fact that the same is bolted to the collar 20.

Sidably mounted relative to the frame section and between the sector gear 30 and angular end wall 14 is a rack bar 34 having rack teeth 35 adapted to engage and mesh with the teeth 33 formed on the peripheral surface of the sector gear 30. The back wall 35a of the rack bar slidably engages the inner wall surface of the angular end wall 14 as shown clearly in Figures 1 and 3. Secured to the rack bar 34 along one side thereof is a supporting plate 37 adapted to be fastened in place by means of machine screws or the like 38 with their heads received in countersunk bores 39 in the rack bar 34 to permit free sliding movement of the rack bar against the plate member 16. The opposite ends of the machine screw 30 are received in screw-threaded openings 40 in the support plate 37 and said support plate is provided with an offset extension 41 intermediate its ends so that the free end may be bifurcated as at 42 to provide a pair of spaced armatures 43. The armatures are provided with openings 44 in axial alignment for receiving a fulcrum pin 45 (Figure 7).

Mounted on a side of the fulcrum pin 45 and between the bifurcated arms 43 is a sine bar 46 having its corner portions at its opposite ends provided with a plate section 46 as at 46. The rounds 48 are held in place by machine screws or the like as at 48, the heads of which are received in countersunk bores 50 extending through the top wall of the sine bar 46. The upper round 48 directly engages the front edge of the supporting plate 37 whereas the lower round 46 engages one end of a gauge block B tightly wedged and frictionally held between the supporting plate 37 and said lower round 48 so as to maintain the sine bar in a preset adjusted position. Different-sized sine blocks B may be employed depending on the predetermined angle desired.

Secured to the sine bar 46 and extending along the entire length of a sector, is a slotted plate 51 extending from one end to the other and said slotted plate is provided with a central bracket portion 53 adapted to be fastened to the sine bar 46 by means of spaced machine screws 54 with the heads thereof countersunk in suitable bores as indicated in Figure 7. The slotted plate 51 is placed in sliding contact engagement with the front wall 12 of the casing section and one end thereof is received in the offset portion 15 of the end wall 14 so as to permit the sine bar to be tilted to approximately 56 degrees as indicated in Figure 3. The outer surface of the tubular extension 26 is flattened as at 55 to further permit the free swinging movement of the sine bar and the full travel of the slotted plate 51 to the limit of its angular movement.

Formed integral with the front wall 12 of the casing section is a pair of spaced bracket arms 56 and 57 and said bracket arms are connected at their outer ends by an integrated bar 58. The undersides of the bracket extensions 56 and 57 are cut away as at 60 and 61 to accommodate an angled slide bar 62 having its angular portion 63 received between the front wall 12 of the frame section and the cutaway portion of each of the bracket arms 56 and 57. A guide rib 64 is secured to the front wall 12 of the casing section by means of machine screws 65 having their heads received in suitable countersunk bores therein. The guide rib 64 is notched as at 66 to receive the upper edge of the angle portion 63 and hold the same in sliding engagement with the front wall 12 of the casing section. The other end of the angled slide bar 62 is provided between a pair of spaced guide members 67 secured to the undersides of the free ends of the bracket extensions 56 and 57 by machine screws 65 received in countersunk bores therein (Figure 8). An additional guide plate or rib 68 is affixed to the lower portion of the front wall 12 and is similarly held in place by machine screws 70 extending therethrough with their heads received in countersunk bores (Figure 4). The guide rib 68 engages the underside of the angled slide bar 62 so as to hold the same against the guide rib 64 and the rack bar against the plate member 16.

Formed intermediate the ends of the angled slide bar 62 is a V-notch 71 and fastened beneath the angled slide bar 62 adjacent said notch is a clamping frame 72 having an opening 73 for receiving the lower end of a dressing tool support 74 so that the same may be held in clamping engagement with the V-notch 71 by means of a screw 75 threaded in a bore in the clamping frame 72 as at 76 with the free end of the set screw engaging the peripheral surface of the dressing tool support 74. The dressing tool support 74 is tubular and is provided with a central longitudinal bore 71 terminating at the end in the enlarged bores 78 and 79. Received within the en-
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larged bore 79 is the Shank portion 80 of an adapter having a head 81 and extending through said bore 77 is a locking screw 82 having its head 83 received in said enlarged bore 78 and its threaded portion 84 received in a threaded bore 85 in the blank 86 of the adapter. The head portion 81 of the adapter is provided with a pair of diametrically disposed projections 81a adapted to be received in notches 86 formed in the upper end of the cutting tool support 74. The adapter 81 is provided with an offset arm 87 having a traverse bore for guiding the grinding wheel support 88 which may be held in place by a set screw or the like as at 89. The diamond cutting tool 88 is held in said transverse bore 89 by the set screw 88 so that the diamond cutting point thereof as at 91 will project from the offset arm 87 as shown in Figures 2, 3 and 5. Secured to the angle portion 63 of the slide 62 is a pin 92 having its free end projecting through a slot 93 in the front wall casing section 12 in direct alignment with the slot 52 formed in the slotted plate 51. The extreme free end of the pin 92 is received in a slot in a sliding block 95 mounted to move in the slot 92 of the slotted bar 51 from one end thereof to the other. The slide block 95 is provided with an opening 96 for the reception of said pin 92 so that relative sliding movement between the sliding block and the offset arm 87 is provided sliding movement to said block 95 and a corresponding sliding movement to the slide 62. Formed intermediate the ends of the integrated bar 53 is a centering opening 58a having tapered walls for receiving the conical ends of the centering 6 and said tapered opening 58a is in direct alignment with the axis of the collar 20 and tubular extension 28. It will thus be seen that the frame casing 10 may be supported between the centers 7 and 8 of a suitable grinding machine so as to position the involute form dresser beneath the periphery of the grinding wheel. In operation it will be assumed that the involute form dresser is positioned between the centers of the grinding machines 7 and 8 as above described so that the cutting tool holder 74 will be diagonally aligned on the centering 6 and said tapered opening 58a is in direct alignment with the axis of the collar 20 and tubular extension 28. With the wheel G in the position shown in Figure 4, and the sine bar 46 adjusted in the position shown in Figure 2, the casing frame section 10 may be rotated about the axis of the centers 7 and 8 from the position shown in Figure 2 to the position shown in Figure 3. Upon rotation of the casing 10 the rack bar 24 tracks on the stationary sector gear 30 so as to cause a relative sliding movement between the casing 10 and the sine bar 46. This sliding movement is transmitted to the diamond point supporting member 74 through the medium of the angled slide bar 52, pin 92 and slotting bar 81. It is noted that rotation of the casing 10 about the centers 7 and 8 in a clockwise direction causes the angled slide bar 52 to move to the left a proportionate distance so that the end of the diamond cutting tool 91 will inscribe an involute curve as indicated by the dotted line C in Figures 2 and 3. By moving the casing 10 to and fro on its axis so as to oscillate the casing thereon, the diamond point 91 will generate an involute curve starting from the base circle of the stationary gear and ending at a point determined by the limited rotation of the casing 10. The sine bar 46 is oscillated back and forth, the grinding wheel G is moved from the full line position shown in Figure 4 to the dotted line position so as to feed the grinding wheel into the diamond point 91 and thereby form an involute contour I on the periphery of the grinding wheel G. After one side of the peripheral edge of the grinding wheel has thus been dressed, the bolt 82 is loosened so as to permit the offset arm 87 to be swung about the arc of 130 degrees to position the diamond cutting tool 81 on the other side of the wheel to inscribe the involute curve C'. When the diamond cutting point 91 is thus reversed and the sine bar 46 similarly reversed by inserting a gauge block under the other end thereof, the casing 10 may be swung in a counterclockwise direction so as to form and dress the grinding wheel G with an involute contour I' (Figure 5). When the grinding wheel G has been fed to a point in alignment with the base circle of the sector gear 30 and one side of the peripheral grinding wheel edge has thus been dressed, the grinding wheel is retracted and the offset arm 87 shifted so as to position the diamond point 91 on the other side of the wheel whereupon the wheel is again fed as above described and the casing 10 oscillated in a counterclockwise direction. In setting the sine bar to the desired angle it is necessary to take into consideration the size of the gear for which the grinding wheel is being made or formed with contour surfaces to meet the requirements of the gear structure. As an example, let it be assumed that the gear is of a predetermined diameter which diameter is equal to or smaller than the pitch circle of the stationary gear 30. By simply dividing the base circle circumference of the sector gear 30 by the base circle circumference of the gear being constructed, a fraction will be given which will equal the tangent or rate of change of speed which must be imparted to the diamond cutting point 91 when the casing is oscillated so as to give a prescribed involute curve. Having thus found the tangent which controls the movement of the diamond point cutting tool 91, the sine thereof may be easily found from a trigonometric table so that the sine bar 46 may be moved to a position to give the required acceleration to the diamond point cutting tool 91 by inserting a gauge block B of a known length between the rounds 48 and the rack gear plate 71. For instance, if the gear being considered has a base circle circumference equal to the base circle circumference of the sector gear 30, by simple division the quotient 1 will be given which is the tangent of 45 degrees. Hence, it will be necessary to set the sine bar 46 at such an angle and to do this it is only necessary to select the corresponding sine from a table of trigonometric functions and insert a gauge or sine block B as shown in Figure 3. The opposite end of the sine block when the sine bar is in this position will have its rounds 48 engaging the edge of the rack bar plate 71. It is to be noted that the tool support 74 may be raised or lowered so as to position the diamond cutting tool 91 a distance from the axis of rotation of the casing 10 equal to the radius of the gear for which the grinding wheel G is being contourd and it is to be noted that when gears having a smaller diameter than the base c.r.c.e of the sector gear 30 are under consideration the diamond point tool supporting member 74 may be lowered within a considerable range within the radius of the stationary gear 30. Actually, the motion imparted to the diamond point cutting tool 91 is a retrograde movement in the direction opposite to the rotation of the casing 10. That is, the diamond point cutting tool 91 is fed tangentially to increase the distance
between the points of the diamond cutting tool and the axis of rotation of the casing a proportionate amount depending on the angularity of the sine bar. In Figure 5, the grinding wheel G has been moved downwardly by a feeding thereof toward the involute form dresser to the limit of its movement, and as shown in the drawing, the involute contours I and I' have been formed on the peripheral side edge of the grinding wheel.

It is to be understood that the form of the invention heretofore shown and described is to be taken as a preferred embodiment of the same and that various changes may be made in the shape, size and arrangement of parts without departing from the spirit of the invention or the scope of the subjoined claims.

What I claim is:

1. An involute form dresser comprising support means, a frame member mounted to oscillate about a pivotal point on said support means, a stationary toothed member within said frame member affixed to said support means, a rack slidably mounted in said frame member in tracking engagement with said toothed member, a slide movably mounted on said frame member to move radially with respect to the pivotal axis thereof and in a plane perpendicular to the movement of said rack, a cutting and dressing tool support secured to said slide extending perpendicular thereto, and an actuator pivotally mounted on the rack having a sliding connection with said slide to cause the end of said tool support to incribe an involute curve upon oscillation of said frame member.

2. An involute form dresser comprising support means, a frame member mounted to oscillate about a pivotal point on said support means, a stationary toothed member within said frame member affixed to said support means, a rack slidably mounted in said frame member in tracking engagement with said toothed member, a slide movably mounted on said frame member to move radially with respect to the pivotal axis of said frame and in a plane perpendicular to the movement of said rack, a cutting and dressing tool support secured to said slide extending perpendicular thereto, an adjustable bar member pivoted to the rack member, and a slideable connection between the bar member and slide to cause the end of said tool support to travel along an involute curve when said frame member is oscillated about its pivotal axis.

3. An involute form dresser comprising support means, a frame member mounted to oscillate about a pivotal point on said support means, a stationary toothed member within said frame member affixed to said support means, a rack slidably mounted in said frame member in tracking engagement with said toothed member, a slide movably mounted on said frame member to move radially with respect to the pivotal axis of said frame and in a plane perpendicular to the movement of said rack, a cutting and dressing tool support secured to said slide, a sine bar pivoted to the rack member, and a sliding connection between the slide and sine bar whereby oscillation of said frame member about its axis will cause the end of said tool support to traverse an involute curve.

4. An involute form dresser comprising support means, a frame member mounted to oscillate about a pivotal point on said support means, a stationary toothed member within said frame member affixed to said support means, a rack slidably mounted in said frame member in track-
engaged by a gauge block interposed between the rack and said actuator.

8. An involute form dresser comprising support means, a frame member mounted to oscillate about a pivot point on said support means, a stationary toothed member within said frame member affixed to said support means, a rack slidably mounted in said frame member in tracking engagement with said toothed member, a slide movably mounted on said frame member to move radially with respect to the axis of said frame and in a plane perpendicular to the movement of said rack, a cutting and dressing tool support secured to said slide, an adjustable bar pivotally mounted to the rack member, and a sliding connection between the bar member and said slide to cause the end of said tool support to travel along an involute curve when said frame member is oscillated about its pivot point, said actuator being offset from said rack to permit adjustment thereof to various angles whereby the tool support will be moved at various rates of speed to inscribe involute arcs of different pitch.

9. An involute form dresser comprising support means, a frame member mounted to oscillate about a pivot point on said support means, a stationary toothed member within said frame member affixed to said support means, a rack slidably mounted in said frame member in tracking engagement with said toothed member, a slide movably mounted on said frame member to move in a plane perpendicular to the movement of said rack, a cutting and dressing tool support secured to said slide, an adjustable bar pivotally mounted to the rack member, and a sliding connection between the bar member and said slide to cause the end of said tool support to travel along an involute curve when said frame member is oscillated about its pivot point, said adjustable bar member being pivoted between its ends with gauge block engaging members disposed at each end thereof for being engaged by a gauge block inserted between the rack member and said bar to hold said bar in a predetermined position.

10. An involute form dresser comprising support means, a frame member mounted to oscillate about a pivot point on said support means, a stationary toothed member within said frame member affixed to said support means, a rack slidably mounted in said frame member in tracking engagement with said toothed member, a slide movably mounted on said frame member to move in a plane perpendicular to the movement of said rack, a cutting and dressing tool support secured to said slide, a sine bar pivoted to the rack member, and a sliding connection between the slide and sine bar whereby oscillation of said frame member about its axis will cause the end of said tool support to traverse an involute curve, said sine bar being pivoted to the rack intermediate to its ends to permit the insertion of a gauge block located about its pivot axis, said adjustable bar member being pivoted between its ends with gauge block engaging members disposed at each end thereof for being engaged by a gauge block inserted between the rack member and said bar to hold said bar in a predetermined position.

11. An involute contour dresser adapted to be supported on a grinding machine having a grinding wheel and opposed spaced support centers disposed therein, comprising a frame member mounted between said centers for oscillation about the axis thereof, a grinding wheel dressing tool mounted on said frame member and disposed for movement along an involute path on either side of the center line of said grinding wheel upon oscillation of said frame member about its axis, means to move said dressing tool over the peripheral edge of the grinding wheel to generate an involute contour thereon, and means for adjusting said last-mentioned means to cause said dressing tool to travel in a number of involute arcs of different pitch, said adjusting means comprising a sine bar which may be adjusted to impart the desired rate of travel of said dressing tool.

12. An involute form dresser for a grinding machine having a grinding wheel and opposed spaced support centers disposed therebeneath, comprising a frame member mounted between said centers for oscillation about the axis of said grinding wheel, a grinding wheel dressing tool mounted on said frame member, means to move said dressing tool over the peripheral edge of the grinding wheel to generate an involute contour thereon, and means for adjusting said last-mentioned means to cause dressing tool to travel in a number of involute arcs of different pitch, said means comprising a sine bar which may be adjusted to impart the desired rate of travel of said dressing tool.

13. An involute form dresser for a grinding machine having a grinding wheel and opposed spaced support centers disposed therebeneath, comprising a tubular support member mounted on one of said spaced centers, a frame mounted on said support means for oscillation about the axis of said grinding wheel, a grinding wheel dressing tool mounted on said frame member, means to move said dressing tool over the peripheral edge of the grinding wheel to generate an involute contour thereon, and means for adjusting said last-mentioned means to cause dressing tool to travel in a number of involute arcs of different pitch, said means comprising a sine bar which may be adjusted to impart the desired rate of travel of said dressing tool.

14. An involute contour dresser for a grinding machine having a grinding wheel and opposed spaced support centers disposed therebeneath, comprising a tubular support member mounted on one of said spaced centers, a frame mounted on said support means for oscillation about the axis of said grinding wheel, a grinding wheel dressing tool mounted on said frame member, means to move said dressing tool over the peripheral edge of the grinding wheel to generate an involute contour thereon, and means for adjusting said last-mentioned means to cause dressing tool to travel in a number of involute arcs of different pitch, said means comprising a sine bar which may be adjusted to impart the desired rate of travel of said dressing tool.
volute pathway on either side of the center line of said grinding wheel, and a sine bar pivoted to the rack intermediate its ends having a slot for being engaged by a projection on said slide whereby rocking movement of said frame in one of its two rotational directions will cause said dressing tool to generate an involute curve and dress said grinding wheel with a corresponding contour on one side of said center line corresponding to the predetermined position of the dressing tool.

15. An involute form dresser for grinding wheels, comprising a support, a frame member oscillatable about a pivot point said support, a dressing tool slidably carried by said frame member and arranged on the center line of said grinding wheel for movement along an involute pathway on either side of said center line, a sector-shaped member secured to said support, a movable bar member drivingly engaging said sector-shaped member, a sine bar pivoted to said bar member, and a sliding connection between said sine bar and said dressing tool to cause said tool to inscribe an involute contour on one side of the center line of the grinding wheel surface when said frame member is oscillated from one side thereof to the other and as the frame member is oscillated about its pivot point, said sliding connection comprising a sine bar pivoted to the bar member capable of adjustment to various angles to impart a tangential movement to the dressing tool proportionate to the amount of rotation of the frame member whereby grinding wheels with involute forms of various pitch may be dressed and a dressing tool being adjustable radially with respect to the pivot point of said frame member to permit the dressing of involute surfaces generated from various base circles.

16. An involute form dresser for grinding wheels, comprising a support, a frame member oscillatable about a pivot point on said support, a dressing tool slidably carried by said frame member and arranged for movement along an involute pathway on either side of said center line, a sector-shaped member secured to said support, a movable bar member drivingly engaging said sector-shaped member, a sine bar pivoted to said bar member, and a sliding connection between said sine bar and said dressing tool to cause said tool to inscribe an involute contour on one side of the center line of the grinding wheel when said frame member is rotated in its other direction of rotational movement.

17. An involute form dresser for grinding wheels, comprising a support, a frame member oscillatable about a pivot point on said support, a dressing tool support slidably carried by said frame member and arranged for movement along an involute pathway on either side of the center line of said grinding wheel, a sector-shaped member secured to said support, a movable bar member drivingly engaging said sector-shaped member, a sine bar pivoted to said bar member, and said dressing tool to cause said tool to inscribe an involute contour on one side of the center line of the grinding wheel surface as the frame member is rotated about its pivot point in one of its two directions of rotational movement and to move said dressing tool to inscribe an involute contour on the other side of said center line of the grinding wheel when said frame member is rotated in its other direction of rotational movement.

18. An involute form dresser for grinding wheels, comprising a support, a frame member oscillatable about a pivot point on said support, a dressing tool slidably carried by said frame member and arranged for movement along an involute pathway on either side of the center line of said grinding wheel, a sector-shaped member secured to said support, a movable bar member drivingly engaging said sector-shaped member, a sine bar pivoted to said bar member, a sliding connection between said sine bar and said dressing tool to cause said tool to inscribe an involute contour on one side of the center line of the grinding wheel surface as the frame member is rotated about its pivot point in one direction of rotation and to cause said dressing tool to inscribe an involute contour on the other side of said center line when said frame member is rotated in its other direction of rotational movement, and a keeper member adapted to engage said support to hold said sector-shaped member against rotary movement when the frame member is oscillated about said pivot point.

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