Sept. 14, 1948. G. F. EGLINTON ET AL 2,449,372

COMPENSATING ABRASIVE WHEEL DRESSING MACHINE

Filed Nov. 15, 1944

4 Sheets-Sheet 1

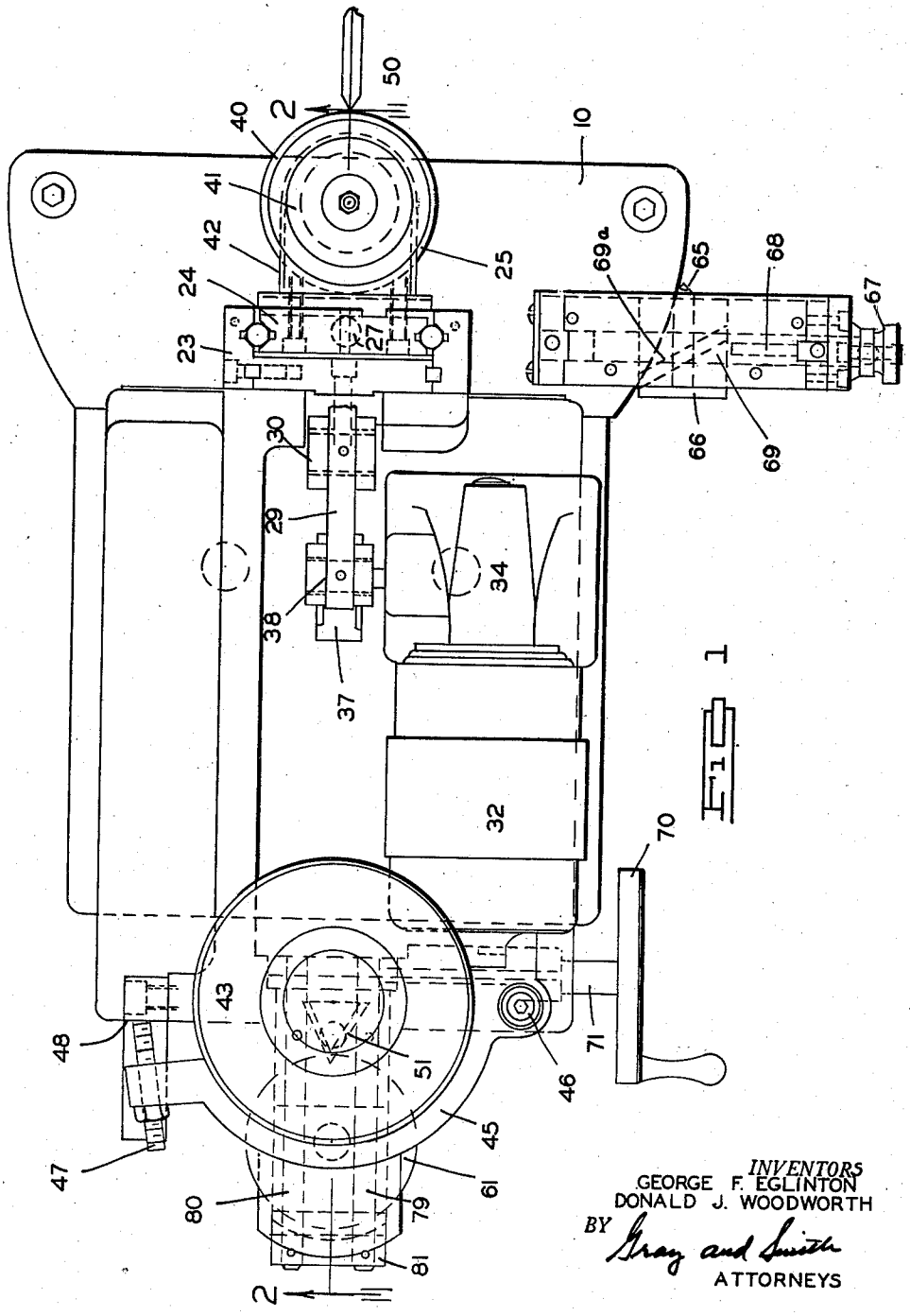


FIG. 1

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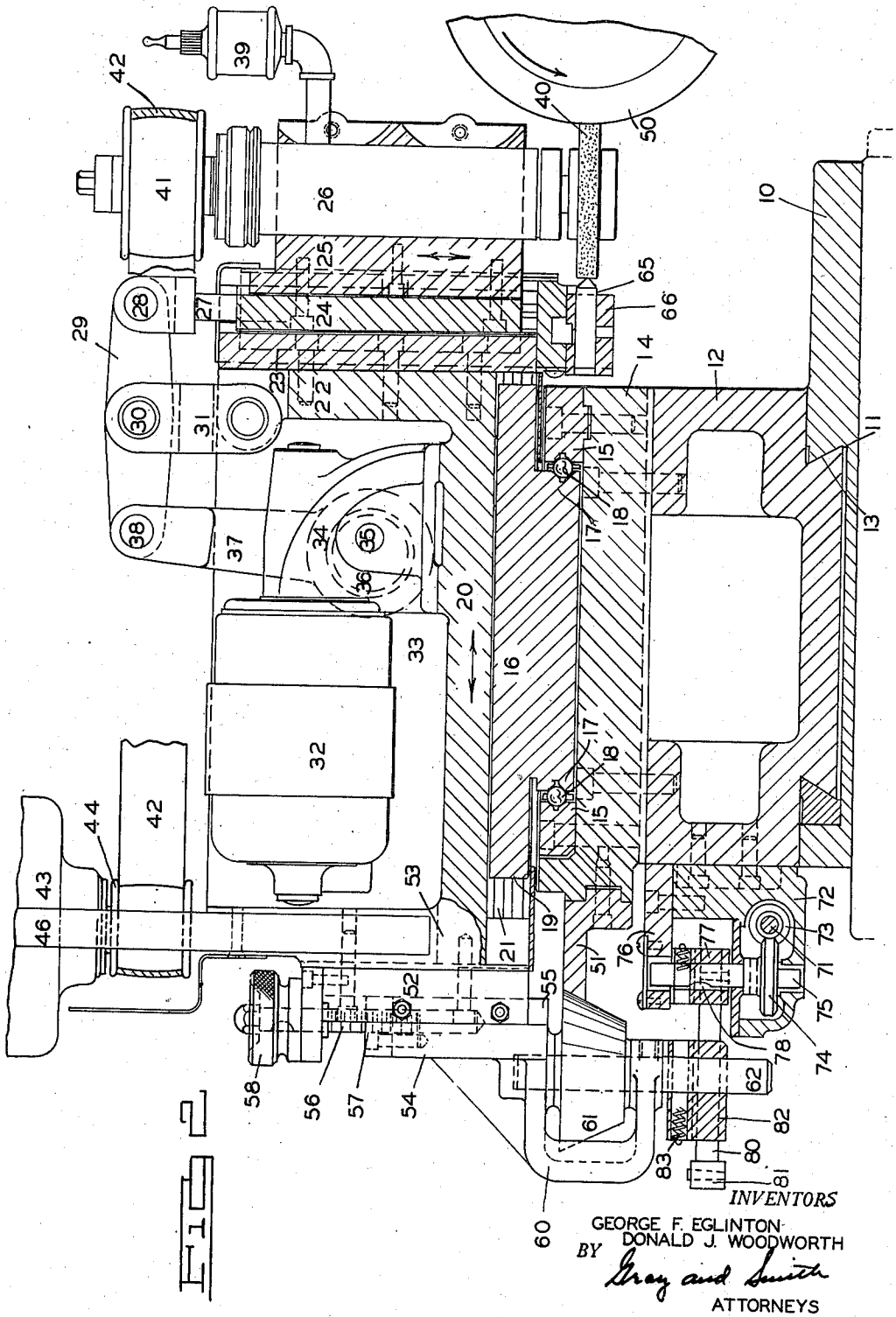


FIG. 2

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COMPENSATING ABRASIVE WHEEL DRESSING MACHINE

Filed Nov. 15, 1944 4 Sheets-Sheet 3

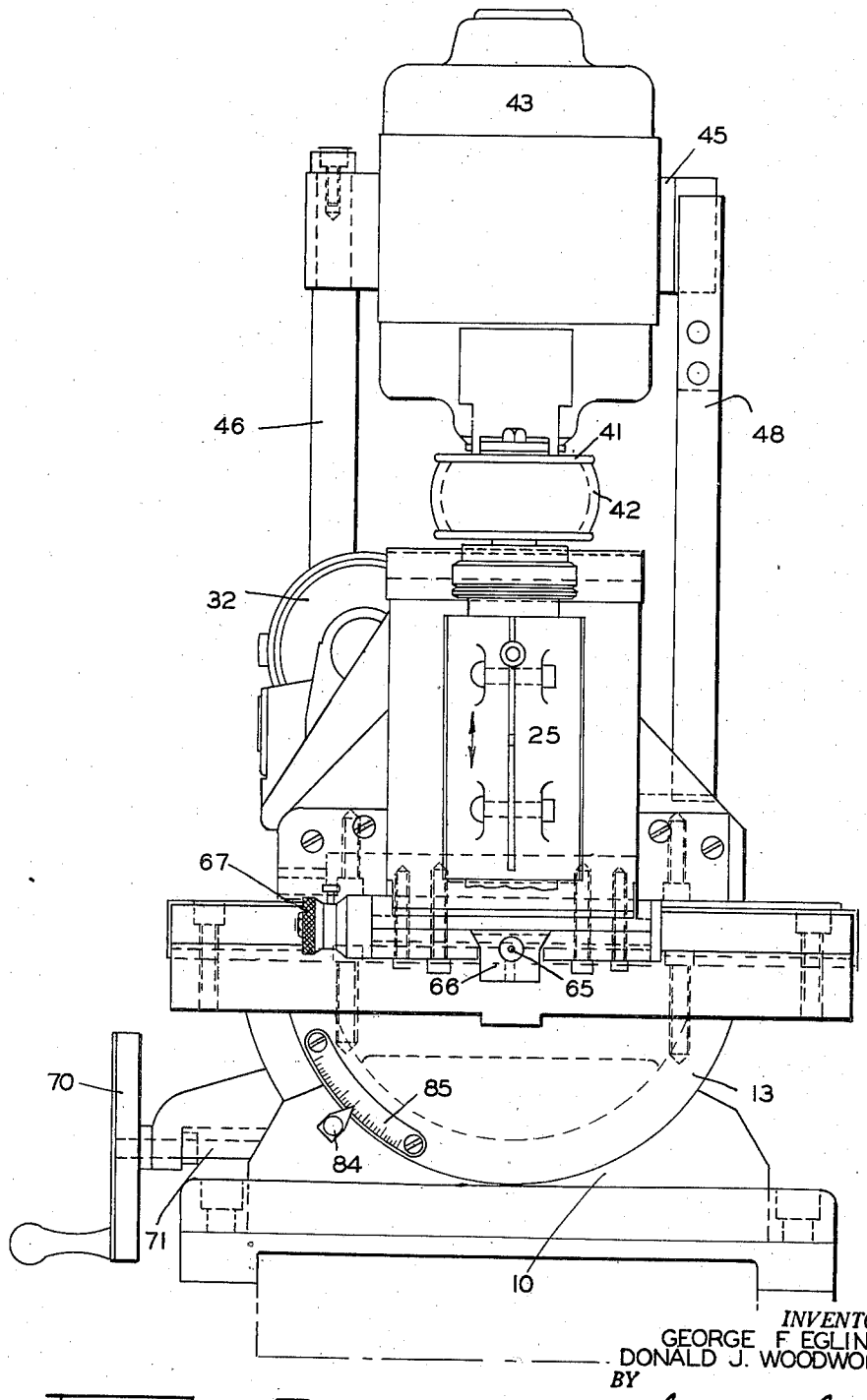


FIG 2

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COMPENSATING ABRASIVE WHEEL DRESSING MACHINE

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4 Sheets-Sheet 4

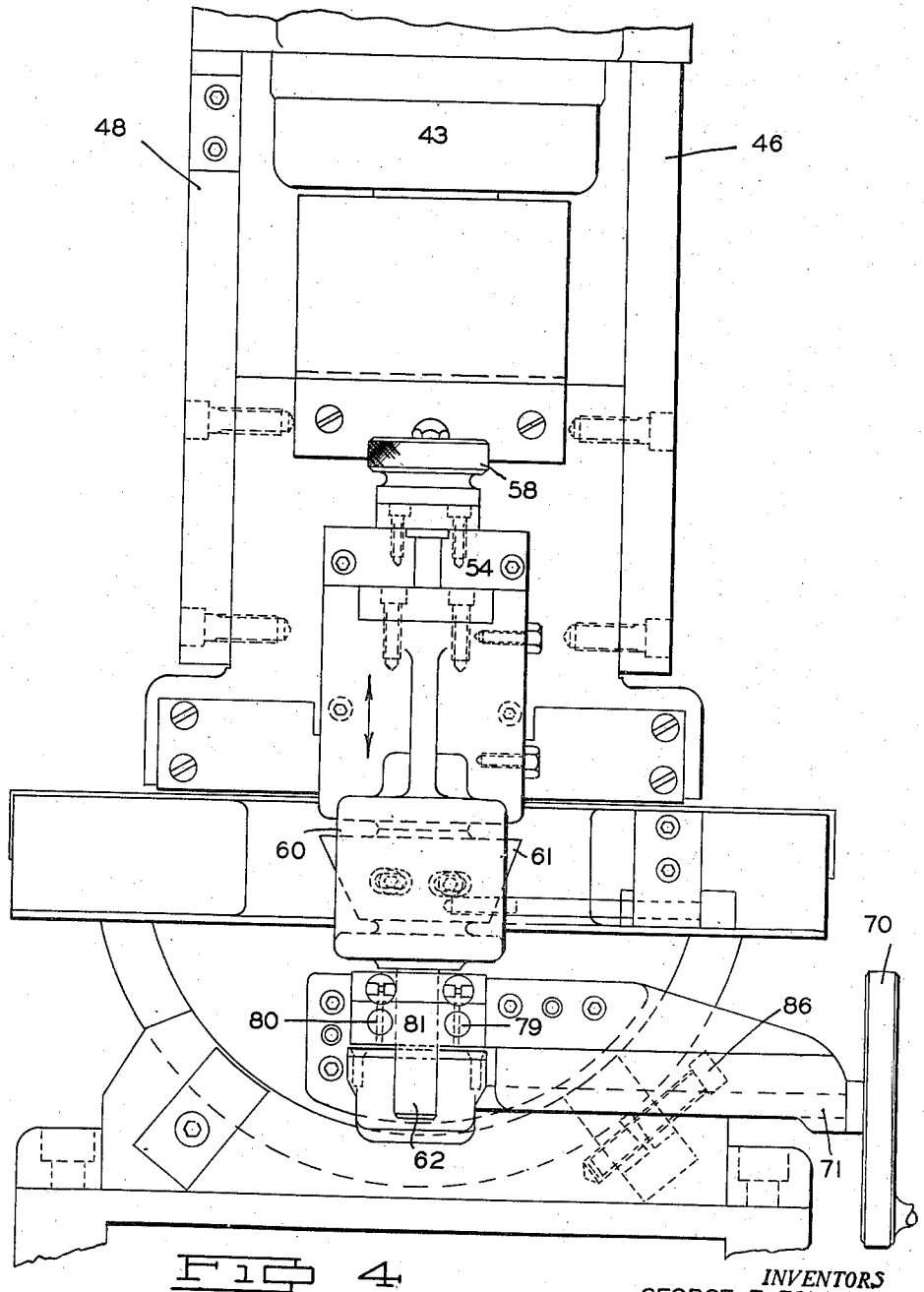


Fig 4.

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Patented Sept. 14, 1948

2,449,372

UNITED STATES PATENT OFFICE

2,449,372

COMPENSATING ABRASIVE WHEEL DRESSING MACHINE

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Application November 15, 1944, Serial No. 563,474

13 Claims. (Cl. 51—100)

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The present invention relates to a compensating abrasive wheel dressing machine for forming, dressing or truing the operative faces of grinding wheels used in form grinding. More particularly, the present invention provides a compensating wheel dressing machine adapted for the grinding or truing within close precision limits of abrasive wheels, such for example as diamond impregnated wheels, utilized in grinding high precision forms in a work piece.

In the particular embodiment herein disclosed the machine of the present invention is designed to dress the grinding edge of an abrasive wheel utilized in the precision grinding British standard threads on a high precision thread gauge. In such use, it is essential that the shape and dimensions of the grinding wheel be maintained to the desired shape within close precision limits. This is accomplished by first dressing the grinding surface of the grinding wheel to the desired shape and thereafter by performing truing operations thereon to maintain the desired working form within the desired limits. In the instance just mentioned, a diamond impregnated abrasive wheel is employed as the grinding wheel to grind the desired thread form into the body of the gauge member which is formed of a hard wear resisting material, such for example as tungsten carbide. The grinding wheel edge is dressed to provide angularly inclined cutting faces thereon which join each other in a small radius to form an arcuate circumferential edge on said wheel. When such a wheel is employed for grinding the body of the gauge, the thread form which results from its use has inclined side portions joined in an arcuate bottom portion corresponding to the shape of the dressed or trued grinding surfaces of the grinding wheel. It is to be understood however, that the machine of the present invention is a universal type machine and may be utilized either to dress or true the grinding form surface of any type of abrasive grinding wheel.

The present application is related to Patent No. 2,373,882 in the name of George F. Eglinton, owned by our common assignee.

It is an object of the present invention to provide a compensating abrasive wheel dressing machine characterized particularly by its accuracy in operation, its relative simplicity of structure and design and its ready adaptability to the grinding or truing of abrasive wheels having different shaped grinding edges, and by means of which the shaped grinding edge is uniformly dressed or trued to a desired form within close precision limits.

A further object of the present invention is to provide a compensating wheel dressing machine in which the dressing wheel is moved through a fixed dressing cycle at a uniform wheel dressing pressure and, if desired, at an adjustably fixed

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angle relative to the abrasive wheel grinding surfaces.

It is a further object of the present invention to provide a compensating wheel dressing machine in which the dressing wheel is rotated and reciprocated while in dressing contact with the grinding surfaces of the abrasive grinding wheel and in which provision is made to true the dressing wheel and to adjust the dressing wheel feeding mechanism to compensate for changes in the diameter of the said dressing wheel as a result of said turning operations.

Other objects of this invention will appear in the following description and appended claims, reference being had to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

In the drawings:

Fig. 1 is a top plan view of a compensating wheel dressing machine embodying the present invention showing the wheel truing tool and carrier in a removed position.

Fig. 2 is a side view partially in elevation and partially in vertical section taken substantially on the line 2—2, Fig. 1, in the direction of the arrows but showing the wheel truing tool in its wheel truing position.

Fig. 3 is an elevation of the right hand end of the machine as shown in Fig. 1 but showing the wheel truing tool in its wheel truing position.

Fig. 4 is an elevation of the left hand end of the machine as shown in Fig. 1.

Before explaining in detail the present invention, it is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

A compensating wheel dressing machine of the present invention may be constructed for operation either as a single independent wheel dressing unit or it may be mounted and used as a permanent sub-assembly on a grinding machine. In either instance it will be mounted on a base member 10, which is provided with arcuate guideways 11. A hollow sub-base 12 is carried on arcuate slides 13, which are seated in the arcuate guideways 11 for movement therein. A fixed table 14 is secured to the top of the sub-base 12, and is provided with guideways 15. A transversely movable table 16 is mounted on the slides 17, which are carried by ball bearings 18 and the guideways 15 of the fixed table 14. The transversely movable table 16 is provided with guideways 19 whose axes extend at right angles to the

axes of the slides 17. The guideways 19 are of the same construction as the guideways 15.

A longitudinally movable table 20 is mounted on slides 21 which are of the same construction as the slides 17, and are carried on ball bearings as previously described in connection with the guideways 15, slides 17, and ball bearings 18. The longitudinally movable table 20 is provided with a flanged end 22 on which is mounted a fixed vertical guideway 23, in which is mounted a reciprocating slide 24, to which is secured the housing 25 of a high speed grinding spindle 26. The high speed grinding spindle 26 is lubricated by any suitable type of lubricating device as for example an oil cup 39.

The guideway 23 and reciprocating slide 24 are of the same ball bearing suspension type previously described in connection with the ways 17 and slide 15. The slide 24 is reciprocated in the guideway 23 by a connecting rod 27 which is pivotally connected as at 28 with a walking beam 29 having a central pivot 30 on a bracket 31 mounted on the flange 22.

The walking beam 29 is driven by an electric motor 32 which is mounted on a motor mounting bracket 33 secured to the top of the table 20. The motor 32 is connected through reduction gears in a gear housing 34 with a cam shaft 35 having an eccentric cam 36 thereon. A connecting rod 37 is connected with the eccentric cam 36 and is pivotally connected at the point 38 with the end of the walking beam 29. The connecting rod 37 causes the walking beam 29 to rock about its central pivot 30 as it is reciprocated by the action of the eccentric cam 36. The rocking motion of the walking beam 29 causes the slide 24 and spindle housing 25 and spindle 26 to be reciprocated vertically in the guideways 23.

A dressing wheel 40 is mounted on the lower end of the high speed grinding spindle 26. At the upper end of the high speed grinding spindle 26 a drive pulley 41 is provided. The drive pulley 41 is power driven through a flexible belt 42 by a motor 43 having a motor drive pulley 44.

The motor 43 is mounted on a motor mounting bracket 45 (see Fig. 1) which is pivotally mounted at one end on a motor bracket suporting rod 46 carried by the longitudinally movable table 20. A belt tensioning screw 47 is provided in the opposite end of the bracket 45 and engages the end of the bracket 45 and the end of a second motor bracket supporting rod 48 carried by the longitudinally movable table 20. This permits an adjustable support of the end of the said bracket 45 while permitting a pivotal adjustment thereof to maintain proper tension on the belt 42.

From the foregoing it will be seen that the dressing wheel 40 is simultaneously power driven by the motor 43 to effect its rotation about a vertical axis and at the same time is bodily reciprocated vertically by the motor 32. The dressing wheel 40 is so operated at all times during the wheel dressing operation in order that the dressing or truing action of the dressing wheel 40 will be uniform at all points on the edge to be trued or dressed on the grinding wheel 50. The vertical reciprocation of the rotating wheel 40 against the edge of the rotating grinding wheel 50 permits the generation, dressing or truing thereof within much closer precision limits than is possible by the use of a dressing wheel which rotates without a bodily vertical reciprocation. The form which is to be generated, dressed or trued on the edge of the grinding wheel 50 is determined by the longitudinal and transverse movement of the dressing wheel 40. This is effected by coordinating the longitudinal movement of the table 20 and the transverse movement of the transversely movable table 16 to produce the desired direction and amount of longitudinal and transverse movement of the dressing wheel 40. This is accomplished by the table guide and feed mechanism now to be described.

On one end of the fixed table 14 there is secured a guide cam 51 whose contour is developed to produce movement of the tables 16 and 20 and to move the dressing wheel 40 in a path to correspond to the desired shape of the working edge of the grinding wheel 50. A fixed bracket 52 having vertical guideways (not shown) is secured to a flange 53 on the end of the longitudinally movable table 20. A movable bracket 54 is mounted on the fixed bracket 52 by means of a slide portion 55 which is engaged in the vertical guideways of the fixed bracket 52. The movable bracket 54 is adjustably moved relative to the fixed bracket 52 by an adjusting screw 56, which is nested in a portion of the fixed bracket and has a screw threaded engagement with a screw threaded recess 57 in the movable bracket 54. Adjustment of the bracket 54 is accomplished by rotating the screw 56 by means of a knurled calibrated adjusting knob 58.

The movable bracket 54 is provided with a forked end 60 in which a frusto-conical cam follower 61 is rotatably mounted on a shaft 62. The upper end of the shaft 62 is secured in the body of the movable bracket 54 and its lower end is mounted in the lower arm of the forked end 60 and extends downwardly therefrom to a point below the said forked end 60 of the bracket 54.

As shown in Fig. 2, the surfaces of the cam follower 61 have a rolling contact with the surfaces of the cam 51, which as here shown are preferably inclined to match the inclination of the surfaces of the cam follower 61. The largest diameter of the cam follower 61 in the present embodiment corresponds to the initial diameter of the dressing wheel 40, or the largest diameter dressing wheel 40 which will be used with the machine. The smallest diameter of the cam follower 61 corresponds to the smallest diameter of the dressing wheel 40, or the diameter of the smallest dressing wheel 40 which will be utilized with the machine.

As shown in Figs. 2 and 3, the dressing wheel 40 is trued by a diamond set wheel truing tool 65, which is mounted in a slidable carrier 66, mounted on the lower face of the fixed vertical guideway 23. The carrier 66 permits bodily movement of the wheel truing tool 65 substantially at right angles to the axis of the spindle 26 in order to bring the tool 65 into and out of wheel truing contact with the grinding edge of the dressing wheel 40. As shown in Fig. 1, the wheel truing tool 65 and the carrier 66 is shown as removed from the lower face of the vertical guideway 23 in order that the parts thereof may be more clearly shown. As there shown, a knurled calibrated adjusting knob 67 is connected with a screw 68 to move a wedge member 69 against an inclined surface 69A of the carrier 66. Any other type of suitable mechanism may be employed to advance or retract the slidable carrier 66 and the diamond set truing tool 65 with respect to the dressing wheel 40. This construction is such that the dressing wheel 40 may be either trued intermittently from time to time by the manual advancement or retraction of the truing tool 65. If desired, the truing of the

dressing wheel 40 may be effected simultaneously with the dressing of the grinding wheel 50 but the intermittent truing of the dressing wheel 40 is to be preferred.

The calibrations of the knob 67 and the knob 58 are preferably coordinated in such a manner that when the wheel truing operation is completed, a reading of the calibrations of the knob 67 may be taken and provide the basis for the adjustment of the knob 58 to correspond thereto. The adjustment of the knob 58 rotates the bracket adjusting screw 56 and moves the movable bracket 54 to bring into contact with the cam 51 a surface of the cam follower 61 having approximately the same diameter as the diameter of the trued dressing wheel 40. Thus any change in the diameter of the dressing wheel 40 may be compensated for by adjustment of the cam follower 61 relative to the cam 51. This same adjustment may be made to accommodate either larger or smaller dressing wheels on the high speed spindle 26.

Movement of the cam follower 61 relative to the cam 51 effects longitudinal movement of the table 20 and transverse movement of the table 16. In the embodiment here shown, the cam follower 61 is moved by manually actuated means but it is to be understood that any other suitable means may be employed. A satisfactory manually actuated mechanism is here shown and includes a crank wheel 70 secured to a rotatable shaft 71 which is journaled in a gear housing 72 secured to the hollow sub-base 12. A reversible worm gear 73 is secured to the rotatable shaft 71 and meshes with a pinion gear 74 fixed to a vertical shaft 75 journaled at one end in gear housing 72, and at the other end in a vertically spaced flange 76 secured to the gear housing 72. The vertical shaft 75 is rotatably driven by the worm 73 and pinion 74 in either direction by corresponding rotation of the shaft 71.

A cross-head bracket 77 is secured to the shaft 71 by a key 78. Parallel guide rods 79 and 80 are secured to the cross-head bracket 77 and extend outwardly therefrom substantially at right angles thereto. The parallel guide rods 79 and 80 are connected at their opposite ends by a cross-arm 81. A slide bracket 82 is slidably mounted on the guide rods 79 and 80, and is connected with the depending lower end of the shaft 62. Suitable spring tensioning members 83 are provided to hold the slide bracket 82 in a suitable position and prevent its unintended movement on the guide rods 79 and 80.

The guide rods 79 and 80 and the slide bracket 82 are moved as a unit in an arcuate path upon rotation of the shaft 75 in response to rotation of the crank wheel 70. This causes the shaft 62 to travel also through an arcuate path carrying with it the bracket 54 and the cam follower 61. The cam contacting surfaces of the cam follower 61 are maintained in surface contact with the cam 61 and are prevented by the spring tensioning members 83 from moving out of contact therewith. As the cam follower 61 is moved by the arcuate movement of the guide rods 79 and 80, it rotates about the shaft 62 and maintains a rolling contact with the contoured edge of the fixed guide cam 51. This causes movement of the slide bracket 82 relative to the guide rods 79 and 80 and transmits a force through the bracket 54 to the table 20 to effect its longitudinal movement if required by the shape of the cam 51 and transmits a force through the table 20 to the table 16 to effect its transverse movement if required by the shape of the cam 51. Thus the cam follower 61 and the cam 51 determines the direction and extent of movement of the tables 20 and 16 and consequently the direction and extent of the path traveled by the rotating and reciprocating dressing wheel 40 during the wheel dressing operation, this path corresponding in shape and size to the contour of the surface to be dressed or trued by the dressing wheel 40.

In certain instances it is desirable to dress a grinding wheel surface having a helix angle formed therein. This is a common occurrence when dressing grinding wheels which are employed in thread grinding operations. In order to dress such a grinding surface the entire wheel dressing assembly is tilted by movement of the arcuate slides 13 in the arcuate guideways 11 which movement may be adjusted and controlled in any desired manner. A fixed indicator 84 (Fig. 3) is provided adjacent a segment 85 of a protractor scale which is mounted on the tilting sub-base 12. As here shown, the wheel dressing machine is set at zero to provide for dressing an edge on a grinding wheel without a helix angle thereon. The parts are held in this position by an adjusting screw and clamp member 86.

In dressing the grinding edge of a grinding wheel utilizing the machine of the present invention, the grinding wheel 50 is rotated on its spindle and the dressing wheel 40 is brought into contact therewith. While the grinding wheel 50 is rotated, the dressing wheel 40 is rotated about its vertical axis and is bodily reciprocated in a vertical plane against the surface thereof at the same time the dressing wheel 40 is moved in a predetermined path either to dress or true the desired contour on the edge of the grinding wheel. The movement of the dressing wheel 40 in a predetermined path is accomplished, as previously described, by the operator manually rotating the crank wheel 70. When the crank wheel 70 has been rotated in one direction to complete the travel of the dressing wheel 40 throughout its full predetermined path in one direction, the crank wheel 70 is rotated in the opposite direction and the cycle is reversed.

It is to be understood that while a machine of the present invention is particularly suited for the uses herein described, it is not expressly limited thereto as it may be readily adapted for numerous uses of a similar or related nature by slight modifications and adjustments which may be readily effected by any mechanic skilled in the art. It will be seen, therefore, that a machine as herein described provides a suitable device for accurately dressing or truing the working surfaces of a grinding wheel within close precision limits.

Having thus described our invention, what we desire to secure by United States Letters Patent is:

We claim:

1. A compensating grinding wheel dresser comprising a base, a table mounted for longitudinal and transverse reciprocation relative to said base, a rotatable dressing wheel carried on a spindle mounted on said table for vertical reciprocation relative thereto, and power means for simultaneously rotating and reciprocating said spindle and dressing wheel vertically relative to the grinding wheel to be dressed, and means for moving said table longitudinally and transversely of said base in a predetermined path and including a fixed cam on said base, a cam follower secured to said table, and means for moving said cam follower relative to said cam.

2. A compensating grinding wheel dresser comprising a base, a table mounted for longitudinal and transverse reciprocation relative to said base, a rotatable dressing wheel carried on a spindle mounted on said table for vertical reciprocation relative thereto, and power means for simultaneously rotating and reciprocating said spindle and dressing wheel vertically relative to the grinding wheel to be dressed, and means for moving said table longitudinally and transversely of said base in a predetermined path and including a fixed cam on said base, a cam follower secured to said table, and means for moving said cam follower relative to said cam, said fixed cam having a contour corresponding to the contour of the working surface of a grinding wheel to be dressed.

3. A compensating grinding wheel dresser comprising a base, a table mounted for longitudinal and transverse reciprocation relative to said base, a rotatable dressing wheel carried on a spindle mounted on said table for vertical reciprocation relative thereto, and power means for simultaneously rotating and reciprocating said spindle and dressing wheel, and means for moving said table longitudinally and transversely of said base in a predetermined path and including a fixed cam on said base, a cam follower secured to said table, and means for moving said cam follower relative to said cam, said cam follower comprising a frusto-conical roller rotatably mounted in a bracket mounted on said table for vertical movement relative thereto.

4. A compensating grinding wheel dresser comprising a base, a table mounted for longitudinal and transverse reciprocation relative to said base, a rotatable dressing wheel carried on a spindle mounted on said table for vertical reciprocation relative thereto, and power means for simultaneously rotating and reciprocating said spindle and dressing wheel, and means for moving said table longitudinally and transversely of said base in a predetermined path and including a fixed cam on said base, a cam follower secured to said table, means for moving said cam follower relative to said cam, said cam follower comprising a frusto-conical roller rotatably mounted in a bracket mounted on said table for vertical movement relative thereto, and adjustable means for moving said bracket vertically relative to said table to compensate for variations in the diameter of said dressing wheel.

5. A compensating grinding wheel dresser comprising a base, a table mounted for longitudinal and transverse reciprocation relative to said base, a rotatable dressing wheel carried on a spindle mounted on said table for vertical reciprocation relative thereto, power means for simultaneously rotating and reciprocating said spindle and dressing wheel, and means for moving said table longitudinally and transversely of said base in a predetermined path and including a fixed cam on said base, a cam follower secured to said table, means for moving said cam follower relative to said cam, said fixed cam having a contour developed in relation to the contour of the working surface of a grinding wheel to be dressed and said cam follower comprising a frusto-conical roller rotatably mounted in a bracket mounted on said table for vertical reciprocation relative thereto.

6. A compensating grinding wheel dresser comprising a base, a table mounted for longitudinal and transverse reciprocation relative to said base, a rotatable dressing wheel carried on a spindle mounted on said table for vertical reciprocation

relative thereto, power means for simultaneously rotating and reciprocating said spindle and dressing wheel, and means for moving said table longitudinally and transversely of said base in a predetermined path and including a fixed cam on said base, a cam follower secured to said table, means for moving said cam follower relative to said cam, said fixed cam having a contour developed in relation to the contour of the working surface of a grinding wheel to be dressed, said cam follower comprising a frusto-conical roller rotatably mounted in a bracket mounted on said table for vertical movement relative thereto, and adjustable means for moving said bracket vertically relative to said table to compensate for variations in the diameter of said dressing wheel.

7. A compensating grinding wheel dresser comprising a base, a table mounted for longitudinal and transverse reciprocation relative to said base, a rotatable dressing wheel carried on a spindle mounted on said table for vertical reciprocation relative thereto, power means for simultaneously rotating and reciprocating said spindle and dressing wheel, means for moving said table longitudinally and transversely of said base in a predetermined path and including a fixed cam on said base, a cam follower secured to said table, means for moving said cam follower relative to said cam, and means for adjustably turning said table about its longitudinal axis to permit said dressing wheel to dress a helix angle on the working surface of the grinding wheel to be dressed.

8. A compensating grinding wheel dresser comprising a base, a table mounted for longitudinal and transverse reciprocation relative to said base, a rotatable dressing wheel carried on a spindle mounted on said table for vertical reciprocation relative thereto, power means for simultaneously rotating and reciprocating said spindle and dressing wheel, means for moving said table longitudinally and transversely of said base in a predetermined path and including a fixed cam on said base, a cam follower secured to said table, means for moving said cam follower relative to said cam, said fixed cam having a contour developed in relation to the contour of the working surface of a grinding wheel to be dressed, said cam follower comprising a frusto-conical roller rotatably mounted in a bracket mounted on said table for vertical movement relative thereto, and means for adjustably turning said table about its longitudinal axis to permit said dressing wheel to dress a helix angle on the working surface of the grinding wheel to be dressed.

9. A compensating grinding wheel dresser comprising a base, a table mounted for longitudinal and transverse reciprocation relative to said base, a rotatable dressing wheel carried on a spindle mounted on said table for vertical reciprocation relative thereto, power means for simultaneously rotating and reciprocating said spindle and dressing wheel, means for moving said table longitudinally and transversely of said base in a predetermined path, and including a fixed cam on said base, a cam follower secured to said table, and means for moving said cam follower relative to said cam, said fixed cam having a contour developed in relation to the contour of the working surface of a grinding wheel to be dressed, said cam follower comprising a frusto-conical roller rotatably mounted in a bracket mounted on said table for vertical movement relative thereto and adjustable means for moving said bracket vertically relative to said table to compensate

for variations in the diameter of said dressing wheel, and means for adjustably turning said table about its longitudinal axis to permit said dressing wheel to dress a helix angle on the working surface of the grinding wheel to be dressed.

10. A compensating grinding wheel dresser comprising a base, a table mounted for longitudinal and transverse reciprocation relative to said base, a rotatable dressing wheel carried on a spindle mounted on said table for vertical reciprocation relative thereto, power means for simultaneously rotating and reciprocating said spindle and dressing wheel, means for moving said table longitudinally and transversely of said base in a predetermined path and including a fixed cam on said base, a cam follower secured to said table, and means for moving said cam follower relative to said cam, and an adjustably mounted wheel truing tool for truing said dressing wheel and including a calibrated adjustment means for adjustably feeding the said truing tool to said dressing wheel during the truing operation.

11. A compensating grinding wheel dresser comprising a base, a table mounted for longitudinal and transverse reciprocation relative to said base, a rotatable dressing wheel carried on a spindle mounted on said table for vertical reciprocation relative thereto, power means for simultaneously rotating and reciprocating said spindle and dressing wheel, and means for moving said table longitudinally and transversely of said base in a predetermined path and including a fixed cam on said base, a cam follower secured to said table, and means for moving said cam follower relative to said cam, said cam follower comprising a frusto-conical roller rotatably mounted in a bracket mounted on said table for vertical movement relative thereto, adjustable means for moving said bracket vertically relative to said table to compensate for variations in the diameter of said dressing wheel, and an adjustably mounted wheel truing tool for truing said dressing wheel and including a calibrated adjustment means for adjustably feeding the said truing tool to said dressing wheel during the truing operation, said adjustable means for moving said bracket and said tool dressing adjustment means having coordinating calibrations whereby adjustment of said bracket adjusting means may be made by reference to the calibrations of the adjusting means for said truing tool adjustment means, thereby to permit adjustment of said sam follower to compensate directly for changes in the diameter of said dressing wheel due to the truing action of said truing tool.

12. A compensating grinding wheel dresser comprising a base, a table mounted for longitudinal and transverse reciprocation relative to said base, a rotatable dressing wheel carried on a spindle mounted on said table for vertical reciprocation relative thereto, power means for simultaneously rotating and reciprocating said spindle and dressing wheel, means for moving said table longitudinally and transversely of said base in a predetermined path and including a fixed cam on said base, a cam follower secured to said table, means for moving said cam follower relative to said cam, said cam follower comprising a frusto-conical roller rotatably mounted in a bracket mounted on said table for vertical movement relative thereto, and adjustable means for moving said bracket vertically relative to said table to compensate for variations in the diameter of said dressing wheel, means for adjustably turning said table about its longitudinal axis to permit said dressing wheel to dress a helix angle on the working surface of the grinding wheel to be dressed, an adjustably mounted wheel truing tool for truing said dressing wheel and including a calibrated adjustment means for adjustably feeding the said truing tool to said dressing wheel during the truing operation, said adjusting means on said bracket and said tool dressing adjustment means being coordinated in their calibrations whereby adjustment of said bracket adjusting means may be made by direct reference to the adjusting means of said truing tool adjustment means to permit movement of said cam follower to compensate directly for changes in the diameter of said dressing wheel due to the truing thereof by said truing tool.

13. A compensating grinding wheel dresser comprising a base, a table mounted for longitudinal and transverse reciprocation relative to said base, a rotatable dressing wheel carried on a spindle mounted on said table for vertical reciprocation relative thereto, power means for simultaneously rotating and reciprocating said spindle and dressing wheel and comprising an electric motor for rotating said spindle and dressing wheel, and a separate electric motor for reciprocating said spindle and rotating the dressing wheel in a vertical plane, means for moving said table longitudinally and transversely of said base in a predetermined path, and including a fixed cam on said base, a cam follower secured to said table, means for moving said cam follower relative to said cam, said fixed cam having a contour developed with relation to the contour of the working surface of a grinding wheel to be dressed, said cam follower comprising a frusto-conical roller rotatably mounted in a bracket mounted on said table for vertical movement relative thereto, adjustable means for moving said bracket vertically relative to said table to compensate for variations in the diameter of said dressing wheel, means for adjustably turning said table about its longitudinal axis to permit said dressing wheel to dress a helix angle on the working surface of the grinding wheel to be dressed, an adjustably mounted wheel truing tool for truing said dressing wheel and including a calibrated adjustment means for adjustably feeding the said truing tool to said dressing wheel during the truing operation, said adjusting means on said bracket and the said adjusting means on said truing tool being calibrated in coordination whereby adjustment of said adjusting means on said bracket may be made by reference to the adjusting means of said wheel truing tool adjustment means, thereby to permit movement of said cam follower relative to said cam to compensate directly for changes in the diameter of said dressing wheel due to the action of said truing tool.

GEORGE F. EGLINTON.
DONALD J. WOODWORTH.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,182,362	Fischer	May 9, 1916
1,896,533	Vuilleumier	Feb. 7, 1933
2,115,908	Fox	May 3, 1938
2,331,189	Flygare et al.	Oct. 5, 1943

Certificate of Correction

Patent No. 2,449,372. September 14, 1948.

GEORGE F. EGLINTON ET AL.

It is hereby certified that errors appear in the printed specification of the above numbered patent requiring correction as follows:

Column 2, line 12, for the word "turning" read *truing*; column 9, line 54, for "sam" read *cam*;

and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 7th day of December, A. D. 1948.

[SEAL]

THOMAS F. MURPHY,
Assistant Commissioner of Patents.