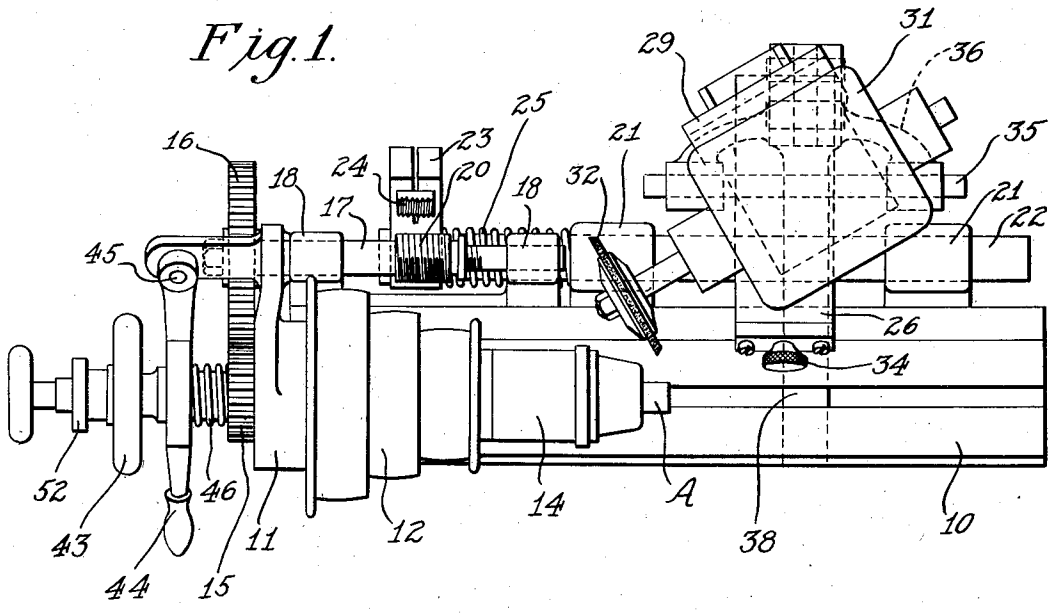
Feb. 16 , 1926. 1,573,523

S. RICHARD, JR

THREAD GRINDING MACHINE

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Fig. 1.



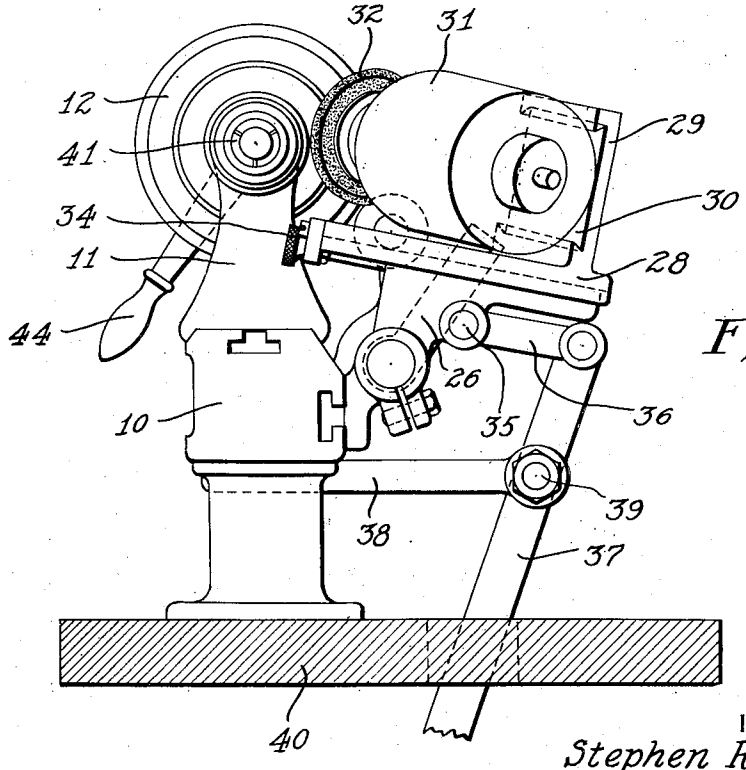


Fig. 2.

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THREAD GRINDING MACHINE

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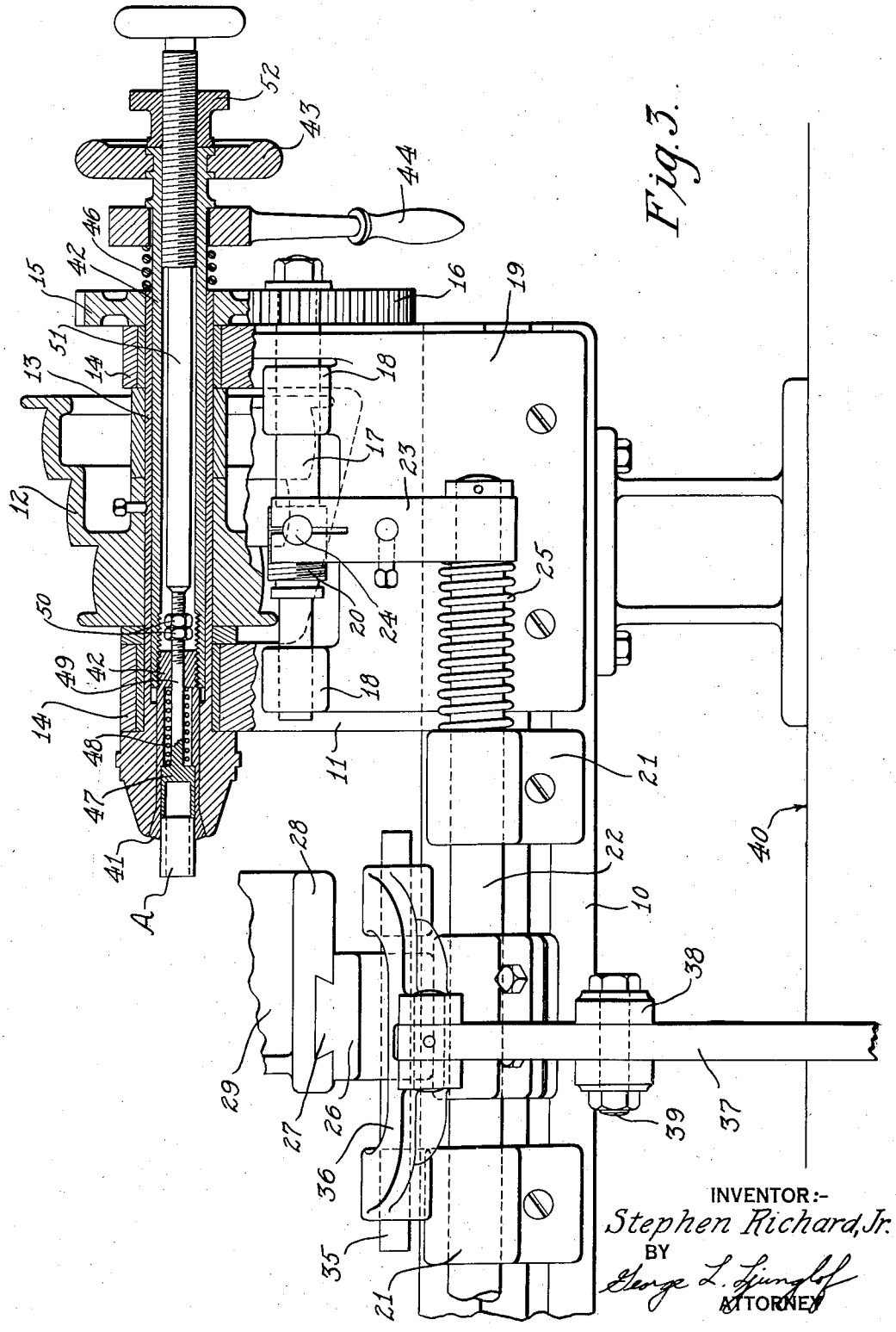


Fig. 3.

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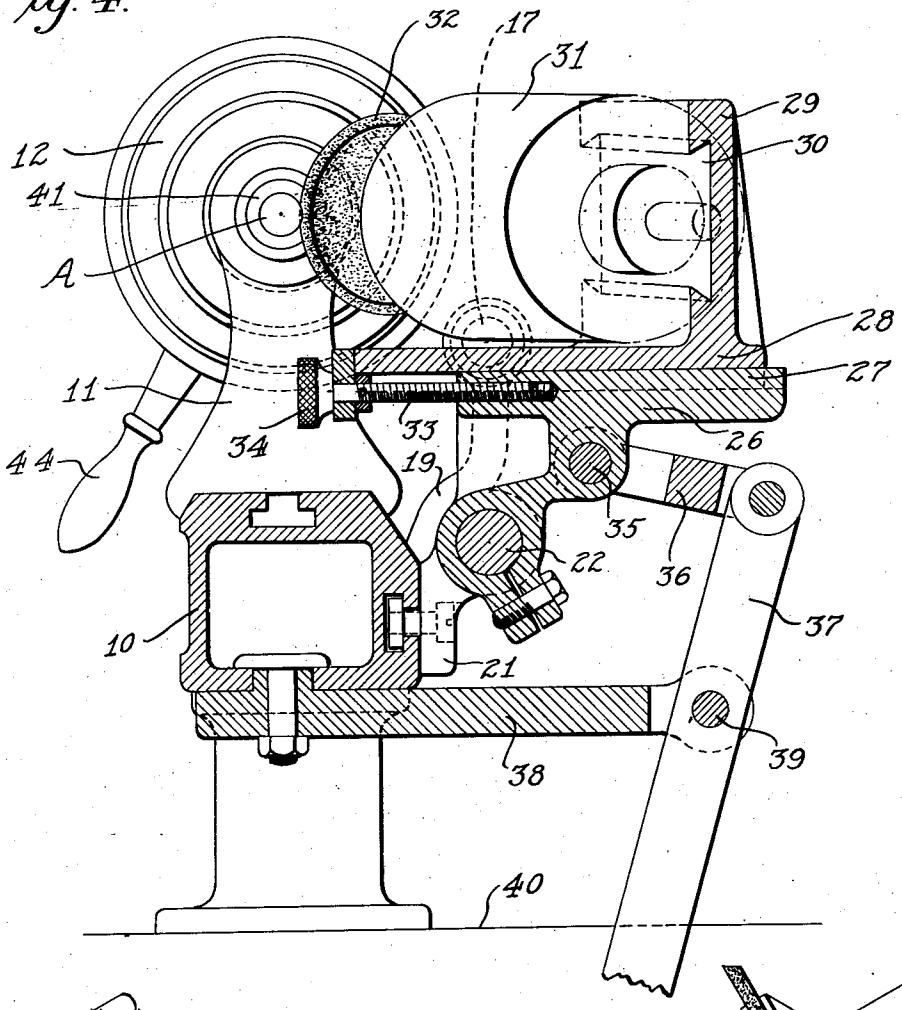
Feb. 16, 1926. 1,573,523

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THREAD GRINDING MACHINE

Filed Dec. 18, 1924 3 Sheets-Sheet 3

Fig. 4.



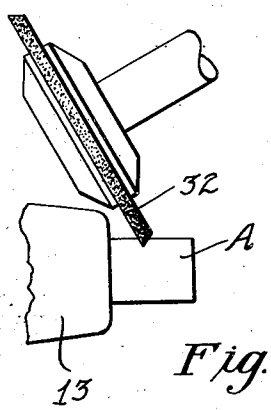


Fig. 5.

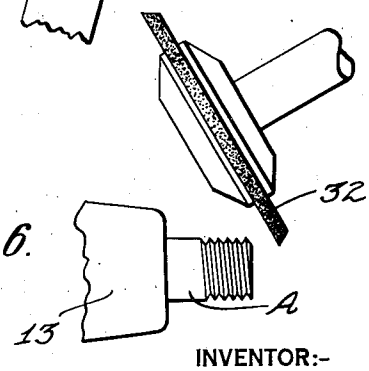


Fig. 6.

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UNITED STATES PATENT OFFICE.

STEPHEN RICHARD, JR., OF STURBRIDGE, MASSACHUSETTS.

THREAD-GRINDING MACHINE.

Application filed December 18, 1924. Serial No. 756,817.

To all whom it may concern:

Be it known that I, STEPHEN RICHARD, Jr., a citizen of the United States, residing at Sturbridge, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Thread-Grinding Machines, of which the following is a specification.

This invention relates to improvements in grinding machines and has particular reference to a device of that character which is especially adapted for grinding screw threads and other helical grooves in hard rubber or other similar non-metallic material for the production of automotive electrical connecting plugs, etc.

An important object of the invention is to provide such a device with a rotatable work holder and a power driven abrasive disc adapted to engage the work and to be moved longitudinally thereof while it is rotated.

Another object is to provide such a device with a grinding disc having its periphery shaped to correspond with the form of thread desired, and angled with respect to the work axis so as to grind both sides of the thread at the same time.

Another object is to provide such a device with a grinding disc angularly disposed in two planes with relation to the work being operated upon, the angularity in one plane being a compensation for the pitch angle of the thread being cut.

Another object is to provide such a device wherein an abrasive disc is mounted so as to be capable of quickly moving it into engagement with the work intermediate its ends, and thereafter movable uniformly outwardly to a point beyond one end.

Another object is to provide such a device with an abrasive disc which is normally out of engagement with the work, and means for automatically returning it to its initial position after the grinding operation is complete.

Another object is to provide such a device with a thread chasing mechanism which will be brought into operation simultaneously with the abrasive disc.

Another object is to provide such a device wherein the moving parts are conveniently arranged at the rear of the machine out of the way of the operator's fingers, whereby rapid production may be obtained with a minimum of danger of injury to the operator.

Another object is to provide such a device which will be simple in construction, strong and durable in service, and an improvement in the art.

With these and other objects in view, the invention resides in the novel features of construction, combination, and arrangement of parts hereinafter set forth, illustrated in the accompanying drawings and specifically pointed out in the appended claims.

In the accompanying drawings wherein a preferred form of the invention is shown for the purpose of illustration,

Figure 1 is a top plan view of a machine embodying the invention, showing the parts in their normal inoperative position.

Figure 2 is an end elevation thereof.

Figure 3 is a rear elevation on a larger scale, parts being broken away, and some parts in section.

Figure 4 is a transverse sectional view through the motor support, showing the parts in operative position.

Figures 5 and 6 are diagrammatic plan views showing the relative position of the abrasive disc and work at different points in the operation of the machine.

Similar reference characters designate corresponding parts throughout the several views of the drawings.

The preferred form illustrated comprises a machine of the lathe type and comprises a bed or frame 10 having mounted at one end a head stock 11, providing work holding means rotatable by a step pulley 12. The pulley 12 is fastened to a hollow spindle 13, which is journaled in head stock bearings 14, and carries a gear 15 which is one of a train of back gears well known to those skilled in the art. The driven gear 16 of the train is mounted on a shaft 17 which is journaled in bearings 18 of a bracket 19 secured to the bed or frame 10. A threaded bushing 20 is secured to the shaft 17 so as to be rotatable therewith for a purpose to be hereinafter set forth.

Secured to the rear side of the bed 10 is a pair of bearing brackets 21 in which is slidable and rotatably mounted a rocking bar 22 carrying at one end a thread chaser arm 23. The upper extremity of the arm 23 is provided with a suitably grooved chaser 24

such as to mesh with the threads on the bushing 20 when moved against the same, whereby it will be moved longitudinally, sliding the rod 22 against the action of a spring 25.

A bracket 26 is clamped or otherwise suitably fastened to the rod 22, and provided on its upper side with a transverse dovetail guide 27 on which is slidably mounted a motor support 28. An angularly disposed vertical extension 29 of the motor support is dovetailed as at 30 for the reception of the base of an electric motor 31. As best shown in Figure 1, the motor shaft is set at an angle of thirty degrees to the axis of the head stock spindle and carries an abrasive disc 32 preferably formed of emery, the periphery of which is beveled to the angle of the thread desired to be cut, in this case sixty degrees. In the vertical plane, as best shown in Figure 4, the motor shaft is slightly angled to compensate for the pitch angle of the thread so that the exact angle of the periphery of the disc 32 will be imparted to the work.

In order to facilitate grinding threads of different depths as well as on different diameters, also to compensate for wear of the disc, the motor support 28 may be adjusted transversely through the instrumentality of a screw 33 and knurled head 34.

A pin 35 extends through the bracket 26 and has a sliding fit therein. The pin 35 also extends through the yoked end of a link 36 which is bolted to the upper end of a lever 37. A bracket 38 is fastened to the bed 10 of the machine and provides a fulcrum 39 for the lever 37, which preferably extends through the top 40 of a supporting bench, and manually operable either by hand or foot as desired.

The disc, motor, and cooperating parts are normally held in inoperative position as shown in Figures 1 and 2. In use a piece of work "A" is positioned in the work holder of the head stock, and the knurled member 34 turned to adjust the motor 31 and abrasive disc 32 in accordance with the depth of thread desired, after which power is applied through the cone pulley 12 for the rotation of the work. The lever 37 is then thrown by the operator to position the parts as shown in Figure 4, whereby the disc 32 engages the work. At the same time that the bracket 26 and motor support 28, etc., are moved forwardly, the chaser 24 is swung into engagement with the threaded bushing 20 which is rotated through the back gears 15 and 16. By virtue of the engagement of the chaser 24 and threaded bushing 20, the rod 22 is slid axially against the action of the spring 25, carrying with it the bracket 26, motor support 28, motor 31, and abrasive disc 32.

From this it will be apparent that the thread generated on the work "A" is started at a point intermediate the ends of the work as shown in Figure 5. As the grinding proceeds the disc 32 is moved longitudinally of the work until it runs beyond the end as shown in Figure 6, whereupon the operator releases the lever 37 allowing the motor support and associated parts to swing back, away from the work. As the motor support swings back from the work the thread chaser becomes disengaged from the bushing 20 whereupon the rod 22 and parts carried thereby are returned to their initial position by the action of the spring 25.

The work holder as shown in Figure 3 has been found in service to be very efficient. This comprises a split work clamping collet 41 having a threaded extremity engageable by the drawing-in spindle 42 having a hand wheel 43 for convenient operation. The drawing-in spindle 42 is slidable in the hollow head stock spindle 13, and adapted to be actuated by a handle 44 which is pivoted at 45 to an extension of the head stock. A spring 46, under compression, holds the collet and drawing-in spindle in work clamping position. An ejector 47 is slidable in the collet 41, and pressed outwardly by a spring 48. The ejector is further provided with a threaded stem 49 having check nuts 50 thereon, and is adapted to abut the end of an adjustment rod 51 which is screwed into the sleeve 42. A lock nut 52 can be screwed up against the hand wheel 43 to securely lock the ejector stop in adjusted position.

As the operator grasps the handle 44 and draws its free end toward the head stock, the spindle 42 and collet 41 are moved outwardly, releasing the clamping pressure on the collet. This loosens the grip on the work "A" which is then thrown out by the ejector 47 from the pressure of spring 48. The operator then takes another piece of work and inserts it in the collet pushing the ejector back to its stop, whereupon the handle 44 is released to clamp the work in the collet.

From the foregoing it will be evident that an improved thread grinding machine has been provided, which will be simple in construction, economical of manufacture, strong and durable in service and an improvement in the art. In view of the fact that the cutting disc and other operative parts are disposed rearwardly of the work, the operator is in no danger of injury therefrom. One of the most important features resides in the fact that the thread is started at a point intermediate the ends of the work, which makes it possible to operate at a much greater speed than prior art machines. Obviously, changes may be resorted to in the minor details of construction, combination, and arrangement of parts, and the right is here-

in reserved to make such changes falling within the scope of the appended claims without departing from the spirit of the invention.

Having thus described the invention, what is claimed is:

1. In a device of the character described, a base, a rotatable work holder mounted thereon, an abrasive wheel adapted to operate upon the work, a pivoted support mounted on the base and adapted to carry the abrasive wheel, means to swing the pivoted support toward or away from the work, means for moving the support and abrasive wheel longitudinally of the work when the wheel is in engagement therewith, and means for returning the support and wheel to its initial position when it is swung away from the work.

2. In a device of the character described, a base, a rotatable work holder mounted thereon, an abrasive wheel adapted to operate upon the work, means for swinging the abrasive wheel toward the work to engage the same, means for moving the wheel longitudinally of the work while in engagement therewith, and a spring for returning the wheel to its initial position when the wheel is swung away from the work.

3. In a device of the character described, a base, a rotatable work holder mounted thereon, a feed screw synchronously rotatable with the work holder, an abrasive wheel adapted to rotate against the periphery of a piece of work in the work holder, a swinging support for the abrasive wheel, and means operable with the swinging support for engaging the feed screw whereby the wheel will be advanced axially of the work while in engagement therewith.

4. In a device of the character described, a rotatable work holder, a chasing thread member rotatable therewith, a motor support mounted rearwardly of the work holder, a motor and abrasive disc carried by the support, means for moving the motor support toward or away from the work holder so as to move the abrasive disc against a piece of work, and a chaser movable with the motor support to engage the chasing thread when the abrasive wheel is operating on the work.

5. In a device of the character described, a work holder, a chasing thread member mounted therewith, means for rotating the work holder and chasing thread member simultaneously, a motor support pivoted for swinging movement in a plane at right angles to the axis of the work holder, a motor angularly disposed on the motor support, an abrasive disc having a beveled periphery carried by the motor, said disc being adapted to form a groove in the work, and means operable with the pivoted motor support to engage the chasing thread member when in its extreme front position.

STEPHEN RICHARD, JR.