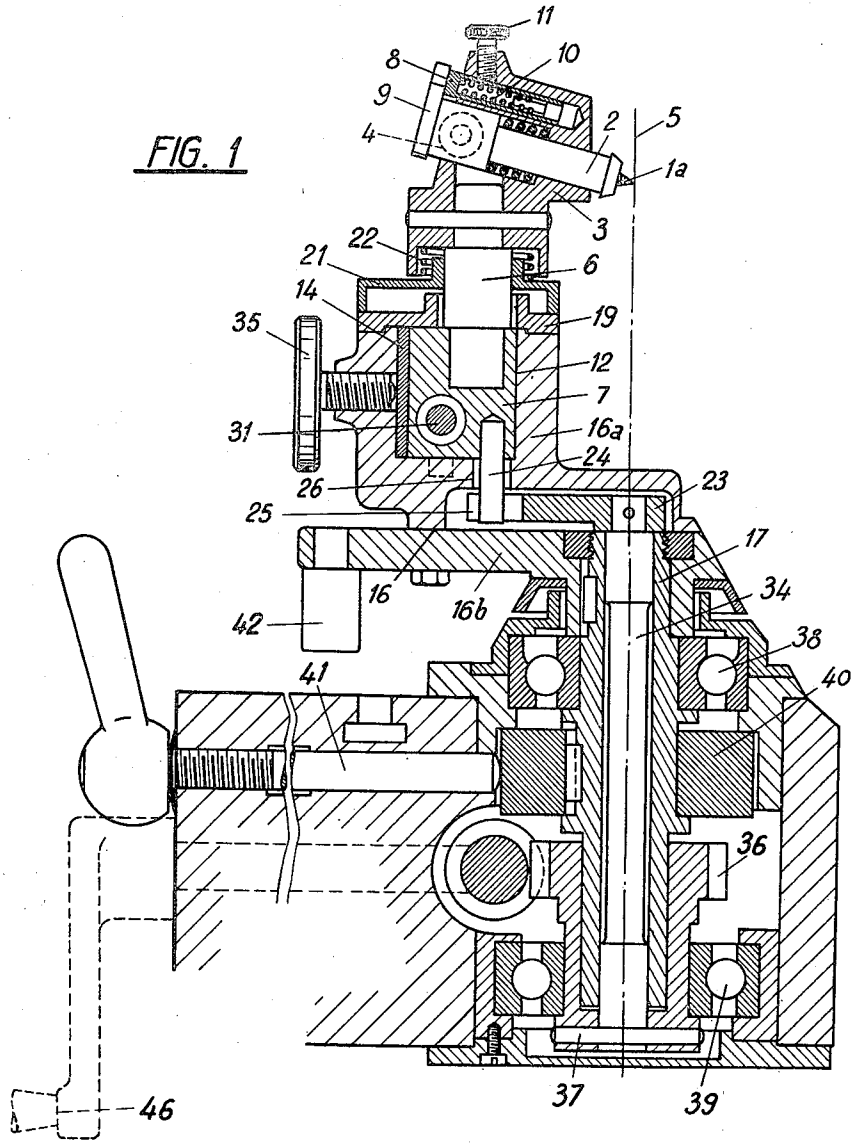
Aug. 1, 1944. F. TURRETTINI 2,355,020

APPARATUS FOR TRUING GRINDING WHEELS

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FIG. 1



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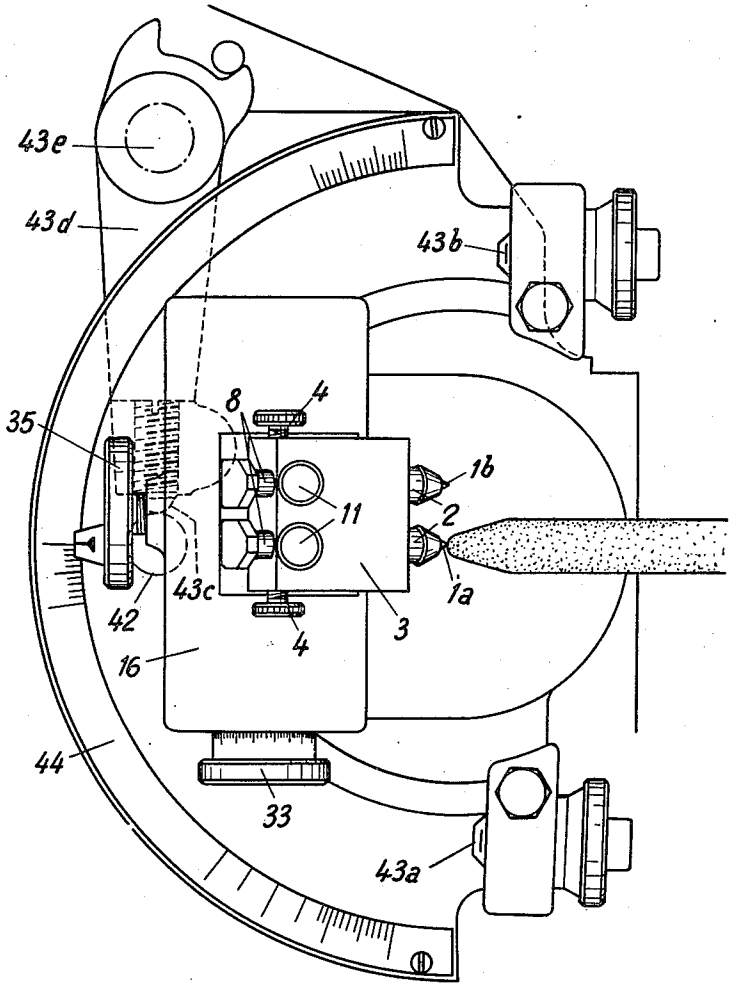


FIG. 2

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APPARATUS FOR TRUING GRINDING WHEELS

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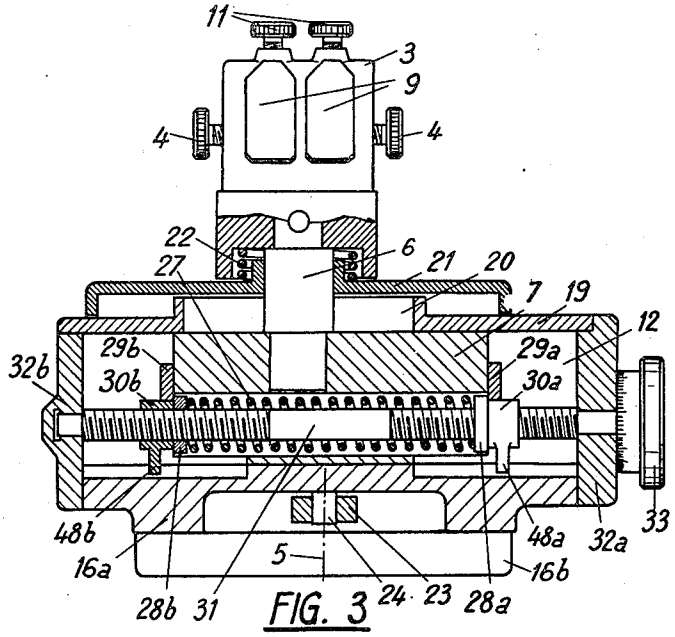


FIG. 3

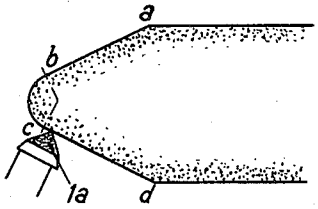


FIG. 4

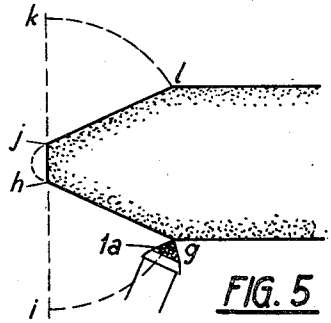


FIG. 5

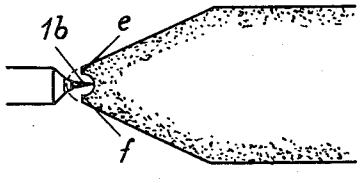


FIG. 6

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Patented Aug. 1, 1944 2,355,020

UNITED STATES PATENT OFFICE

2,355,020

APPARATUS FOR TRUING GRINDING WHEELS

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Application April 27, 1942, Serial No. 440,706
In Switzerland April 30, 1941

5 Claims. (Cl. 125—11)

The object of the present invention is an apparatus for truing grinding wheels; this apparatus comprises a tool holder slider, which can slide on an oscillating base, a spring with initial tension linking this slider and this base, stops limiting the amplitude of the oscillation of the base in both ways, at least two truing tools mounted on the slider and intended to work alternatively, and a control device acting on the slider. This apparatus is characterized in that the above mentioned spring rests on the base through the intermediary of two abutments that an operating organ permits to displace by equal amounts in the same direction, so as to displace the slider through the intermediary of the spring remaining under constant tension, to bring consecutively each one of the tools in working position.

The annexed drawings represent by way of example an embodiment of the object of the present invention.

Fig. 1 is an axial section and Fig. 2 a plan view thereof and Fig. 3 shows a detail section. Figs. 4, 5, and 6 illustrate its operation.

The embodiment represented comprises an oscillating base 16 which is formed by a prismatic block 16*a*, by a plate 16*b* on which this block is fixed and by a vertical tube 17 on which the plate is keyed; this tube is mounted in the housing of the machine on ball-bearings 38 and 39 so as to be able to revolve. In the block 16*a* is arranged a guideway 12 in which a slider 7 can move in both ways. On the latter is fixed a rod 6 on which the tool holder head 3 is pinned.

The latter carries two mounts 2 in each one of which is fixed a diamond, 1*a*, with a relatively blunt point, respectively 1*b*, with an acute point, the two diamonds being intended to work consecutively; each one of the mounts is submitted to the action of an antagonistic spring, they can be adjusted by non-described means, so as to put the end of their respective diamond at the required distance from the axis of rotation 5, and can be set in this position by means of a screw 4. When the position of the mount has thus been adjusted and made secure, one can let a push rod 8 come out and bear against a shoulder 9 of the mount the action of a spring 10, and then lock the push rod 8 by means of a screw 11. This device permits adjusting one of the diamonds backwards, to leave the field free for the other diamond, and then, when the latter has carried out its work, to return the former diamond to its exact position determined by the rod 8, without having to proceed to a new adjustment of its axial position.

In the guideway 12 is disposed a plate 14 which a screw 35 permits to apply against the slider 7 so as to lock the latter temporarily on the oscillating base 16. This slide is closed at both its ends (see Fig. 3) by two plates 32*a*, 32*b* and at its upper part by a cover 19 presenting an aperture 20 letting out the rod 6. This aperture itself is covered by the piece 21 that is submitted to the pressure of a spring 22 and keeps the dust away from the guideway.

The slider 7 presents at its lower part a stud 24 engaged with play in a fork 25 provided at the end of an arm 23. The latter is mounted on a vertical spindle 34 that turns in the tube 17 and on the lower part of which a pinion 36 is fixed by a pin 37. This pinion is linked, through a motion transmitting mechanism, to a handle 46. The stud 24 can move in a slot 26 provided in the bottom of the guideway 12. The slider 7 is connected to the base 16 through the intermediary of a helical spring 27 wound around the stem 31; the latter is pivoted in the plates 32*a*, 32*b* of the base 16 so as to be able to revolve in this base but not to move axially. Each end of the stem presents a screw thread and carries a nut 30*a*, respectively 30*b*, provided with a heel 48*a*, respectively 48*b*, engaged in a straight groove of the bottom of the guideway 12. In this manner, each one of these nuts can move axially on the stem 31, but not turn on it. The spring 27 rests on the washers 28*a*, respectively 28*b*, each one of which bears simultaneously on one of the nuts 30*a*, or 30*b*, and on an abutment 29*a*, or 29*b*, fixed on the slider 7. The stem 31 is provided externally with a graduated head 33 for its control.

The oscillating base 16 carries a nose 42 limiting its movement of rotation in both directions by abutting against one or the other of two adjustable stops 43*a*, 43*b* which can be displaced along the circular graduation 44. This nose 42 can also cooperate with the retractable stop 43*c* mounted at the end of an arm 43*d* that can oscillate around the geometrical axis 43*e*. Finally the tube 17 carries a drum 40, which can be clamped by means of the screw 41.

The operation of the machine described is as follows:

Generally, when it is desired, for instance to grind a screw with a Whitworth thread, one grinds the profile of the thread, on the piece to be wrought, in two operations.

The first one consists in grinding the sides of

the thread and the arc of circle which links them, on the inner diameter, with a single grinding wheel according to Fig. 4, presenting to sides with rectilinear generating lines, for grinding the sides of the thread on the screw, and a convex rim, the cross-section of which is an arc of circle linking both sides of the grinding wheel.

The convex rim of the grinding wheel corresponds to the curve linking both sides of the thread on the inner diameter of the screw. The truing of the grinding wheel for this operation is carried out by means of the diamond 1*a*, which must follow a rectilinear path for truing the sides and pivot around the centre of the linking arc of circle for truing this arc.

The second operation, for grinding the arc of circle linking the sides on the outer diameter of the thread, consists in using another grinding wheel the rim of which presents a concave groove whose cross-section is an arc of circle (Fig. 6). The movement of the diamond 1*b* used for truing the grinding wheel for this operation is limited to a rotation around the centre of the linking arc of circle.

The radius of curvature of these concave and convex arcs of circle on the grinding wheel must be trued with precision in accordance with the specifications of the profile of the thread to be ground.

This point having been made clear, one proceeds as follows:

For truing the grinding wheel according to Fig. 4, one brings the diamond 1*a*, by means of the graduated head 33, into its predetermined position in front of the grinding wheel. This position is observed on the graduation of the head 33; then, by operating the handle 46 which drives the pinion 36, one imparts a rotation to the axis 34. Since the slider 6 controlled by the arm 23 is retained by the initial tension of the spring 27, it cannot move in its guideway 12, and the whole base 16 turns until the nose 42 abuts against one of the stops 43*a* or 43*b*. During this time the diamond describes the arc of circle *b*—*c*, as per Fig. 4. Then, the further rotation of the diamond being impossible, the effort exerted on the slider 7 compresses the spring 27 and pushes the slider in a rectilinear movement in its guideway 2. By imparting to the handle 46 an alternating movement, the diamond will thus be set truing the sides *a*—*b* and *c*—*d* of the grinding wheel.

For truing the grinding wheel according to Fig. 6, one shall bring the diamond 1*b* in front of the grinding wheel by means of the head 33, knowing by a preliminary adjustment what reading has to be made on the graduation of the head 33 in order that the diamond 1*b* comes into working position. One shall lock the slider 7 by means of the screw 35 and, by operating the handle 46, the diamond will be made to rotate around the axis 5 for truing the concave groove *e*—*f*.

For truing a grinding wheel with a profile according to Fig. 5, one shall proceed as follows: One shall bring into working position the retractable stop 43*c*, that is used to define the position of the base 16 in which the slide is oriented as per *i*—*k*, and one shall block the screw 41. The path of the diamond 1*a* under the action of the handle 46 shall be along *i*—*k* and the diamond will true the rim of the grinding wheel from *j* to *h*. One shall thus bring the diamond into *i* and one shall keep it in this position by tightening the screw 35; then, after releasing the screw 41, one shall turn the diamond from *i* to *g*. One shall retighten the screw 41 and release the screw 35; under the action of the handle 46, the diamond will true the side of the grinding wheel from *g* to *h*. One shall repeat the process by analogy for truing the side *j l*.

What is claimed to be new is:

1. In an apparatus for truing grinding wheels, a support, a base mounted for oscillating movement on said support, stops for limiting the oscillating movement of said base, a tool holder slidable on said base, at least two truing tools carried by said holder, spaced abutments, means for adjustably displacing said abutments in the same direction and degree with relation to said base, a spring normally confined under tension between said abutments and displaceable therewith, means for applying the tension of said spring to said tool holder to yieldably retain said holder in a position determined by the adjustment of said displacing means whereby said tools may be alternately brought into operative position, and operating means connected with said tool holder.

2. In an apparatus for truing grinding wheels, a support, a base mounted for oscillating movement on said support, stops for limiting the oscillating movement of said base, a tool holder slidable on said base, at least two truing tools carried by said holder, spaced abutments, means for adjustably displacing said abutments in the same direction and degree with relation to said base, a spring normally confined under tension between said abutments and displaceable therewith, means for applying the tension of said spring to said tool holder to yieldably retain said holder in a position determined by the adjustment of said displacing means whereby said tools may be alternately brought into operative position, operating means connected with said tool holder, and means to lock said tool holder with respect to said base.

3. In an apparatus for truing grinding wheels, a support, a base mounted for oscillating movement on said support, stops for limiting the oscillating movement of said base, a tool holder slidable on said base, at least two truing tools carried by said holder, spaced abutments, means for adjustably displacing said abutments in the same direction and degree with relation to said base, a spring normally confined under tension between said abutments and displaceable therewith, means for applying the tension of said spring to said tool holder to yieldably retain said holder in a position determined by the adjustment of said displacing means whereby said tools may be alternately brought into operative position, operating means connected with said tool holder, and means to lock said base in adjusted angular position with respect to said support.

4. In an apparatus for truing grinding wheels, a support, a base mounted for oscillating movement on said support, stops for limiting the oscillating movement of said base, a tool holder slidable on said base, at least two truing tools carried by said holder, spaced abutments, means for adjustably displacing said abutments in the same direction and degree with relation to said base, a spring normally confined under tension between said abutments and displaceable therewith, means for applying the tension of said spring to said tool holder to yieldably retain said holder in a position determined by the adjustment of said displacing means whereby said tools may be alternately brought into operative position, oper-

ating means connected with said tool holder, means to lock said holder with respect to said base, and means to lock said base in adjusted angular position with respect to said support.

5. In an apparatus for truing grinding wheels, a support, a base mounted for oscillating movement on said support, stops for limiting the oscillating movement of said base, a tool holder slidable on said base, at least two truing tools carried by said holder, a pair of internally threaded abutments, a threaded member for adjustably displacing said abutments in the same direction and degree with relation to said base, a spring normally confined under tension between said abutments and displaceable therewith, means for applying the tension of said spring to said tool holder to yieldably retain said holder in a position determined by the adjustment of said displacing means whereby said tools may be alternately brought into operative position, and operating means connected with said holder.

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