J. SZATMARY.

ATTACHMENT FOR GRINDING THREAD CUTTING TOOLS.

APPLICATION FILED MAY 13, 1919.

1,379,370. Patented May 24, 1921.

Fig. 1.

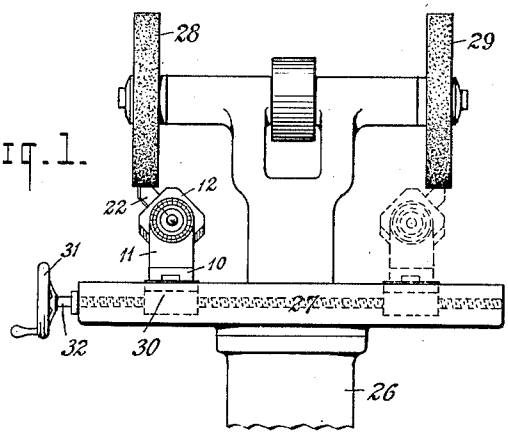


Fig. 3.

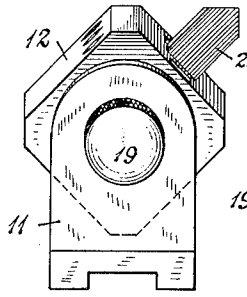


Fig. 2.

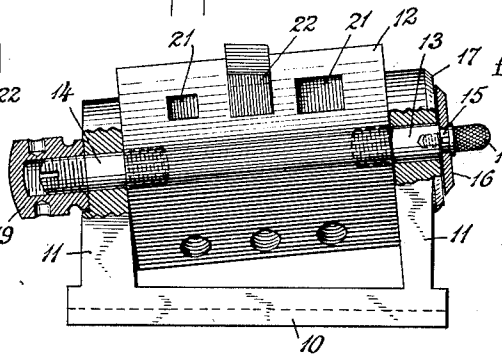


Fig. 4.

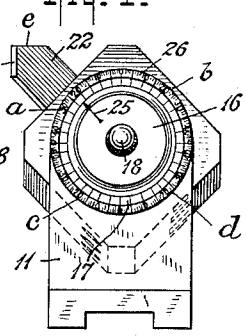


Fig. 5.

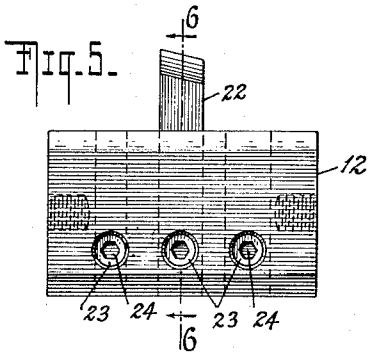
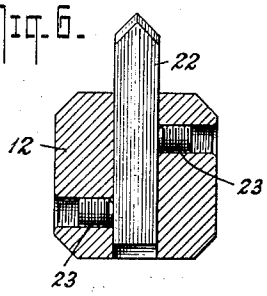


Fig. 6.



WITNESSES

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ATTACHMENT FOR GRINDING THREAD-CUTTING TOOLS.

1,379,370. Specification of Letters Patent. Patented May 24, 1921.

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To all whom it may concern:

Be it known that I, JACOB SZATMARY, a citizen of Hungary, and resident of the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Attachments for Grinding Thread-Cutting Tools, of which the following is a specification.

My invention relates to devices for grinding cutting tools, and more particularly to tools for cutting screw-threads and has for its object to provide a simple attachment whereby the cutting tool may be efficiently and uniformly adjusted in predetermined relation to the grinding elements whereby the cutting tool is automatically ground in accordance with the thread which it is intended to cut. Other more specific objects will appear for the description hereinafter and the features of novelty will be pointed out in the appended claims.

In the accompanying drawings, which for illustrative and descriptive purposes show an example of my invention, Figure 1 shows my attachment in position on one type of grinding machine with which it may be used, the latter being shown diagrammatically; Fig. 2 is a side elevation of the attachment partly in section; Figs. 3 and 4 are end views looking at opposite ends of said attachment; Fig. 5 is a face view of the tool holder forming part of my attachment; and Fig. 6 is a cross-section thereof on the line 6—6 of Fig. 5.

As shown in the drawings, the attachment comprises a supporting base 10 from which standards 11 project upwardly in spaced relation to each other. A tool holder 12 is fitted between said standards 11 and is rotatably mounted thereon by means of trunnions 13 and 14; the latter, in the illustrated example, are in screw-threaded connection with the tool holder 12 and are provided with smooth portions on which the trunnions are journaled in said standards 11. The trunnion 13 is formed with a reduced neck 15 which projects beyond the one standard 11 for the accommodation of an indicator plate 16 which is rotatable in surface engagement with a dial 17 formed on or secured upon the outer face of said one standard 11 for the purpose to be more fully described hereinafter. The indicator plate 16 frictionally fits the neck 15 and is secured thereon against removal in an outward axial direction by means of a device 18 having a screw-threaded stem arranged to screw into said neck 15 which is internally screw-threaded for this purpose. The trunnion 14 projects beyond the other standard 11 and is screw threaded for the accommodation of a nut 19 which is arranged to be screwed into frictional engagement with the outer face of said other standard 11 to secure the tool holder 12 in an adjusted position, as will appear more fully hereinafter; the nut 19 may, if desired, be provided with recesses 20 for the accommodation of a suitable tool whereby said nut may be screwed fully home against the standard 11, as shown in Fig. 2.

As illustrated also in Fig. 2, the axis of the tool holder 12 is inclined with respect to the standards 11 in order to obtain the desired results in grinding, the inside surfaces of said trunnions being accordingly vertically inclined and extending at right angles to said axis in order to properly fit the end faces of the tool holder 12 and to permit rotation thereof in the intended manner. To permit the parts to be readily assembled and disassembled, the trunnions 13 and 14 are provided with slots for the accommodation of a screw driver or other implement whereby said trunnions may be readily disconnected from the tool holder 12. The latter is provided with a plurality of sockets 21 of suitable cross-sectional shape and of different dimensions to receive and hold the cutting tool 22 during the grinding operation. Any suitable means may be provided for temporarily securing the tool 22 in the sockets 21; for instance, as shown, set screw 23 may be provided for this purpose, each socket having two screws located near opposite ends thereof and extending into the tool holder from opposite directions, as shown in Fig. 6. The set screws 23 may be adjusted in any convenient manner and as shown, are provided with polygonal recesses 24 for the reception of a suitable key whereby this adjustment may be accomplished in the well known way.

The indicator plate 16 is provided with a mark or other designation 25 coöperating with a scale consisting of graduations 26 produced upon the dial 17; the graduations 26 in combination with the designation 25 constitute a means whereby the cutting tool 22 may be accurately adjusted to positions

in proper relation to the grinding elements to produce the desired grinding results. In the illustrated example, the graduations read from zero to forty, and consist of two zero marks located at diametrically opposite points on the dial 17 and divisions up to forty which read in opposite directions from each zero mark; the scale thus comprises four parts *a*—*b*—*c*—*d* which are duplicates of each other. The zero marks are in registry with an imaginary line drawn vertically through the axis of the tool holder 12, while the designation 25 is in registry with an imaginary center line extending lengthwise through the tool sockets 21 and is thus always in alinement with the cutting edge of the tool 22 being ground.

The attachment is arranged to be operatively combined with existing grinding machines, of which there are quite a number; for this reason a more or less fanciful mechanism is shown diagrammatically in the drawings, it being understood that this is done merely to illustrate the use of the attachment and for the purposes of description and that the attachment is adapted in actual practice for combination with any type of grinding machine suitable for the purposes in mind. In the fanciful machine diagrammatically illustrated, 26 is a support on which a bed or table 27 is mounted in any suitable manner and so as to be vertically adjustable, the illustration further including grinding means, represented by the duplicate grinding wheels 28 and 29 rotatably mounted at diametrically opposite points on a suitable portion of the support 26. A slide 30 is indicated as being slidably mounted on the table 27 so as to be movable transversely to the grinding wheels 28 and 29, for instance, by means of a hand wheel 31 and screw 32.

My attachment in the grinding machine illustrated, is carried by the slide 30 in any convenient way and so that it will partake of the movements of said slide and in a manner to bring the cutting tools 22 into grinding relation either alternately with the two grinding wheels 28 and 29 or in different grinding relation to either one of said wheels, as will be more fully set forth hereinafter.

In using the attachment, the thread cutting tool 22 which is to be ground, is inserted in one or the other of the sockets 21 of the tool holder 12 and secured therein by means of the proper coöperating set screw 23. The tool holder 12 is then adjusted to bring the tool 22 to the angular position necessary to automatically effect the desired grinding operation, the adjustment being accurately accomplished by means of the designation 25 in coöperation with the section *a* of the scale 26.

For instance, if the surfaces of the tool 22 which converge to the cutting edge thereof and which are to be ground, are to extend at angles of thirty degrees to the longitudinal axis of the tool or in other words, if the tool is intended to cut a thread of thirty degrees, the designation 25 will be set in registry with the graduation thirty of the scale section *a*. After having been properly adjusted, the tool holder 12 is fixed in its adjusted position by screwing up the nut 19 into firm engagement with the contiguous trunnion 11. The slide 30 is then adjusted by means of the hand wheel 31 and screw 32 to bring the attachment into proper position relatively to one or the other of the wheels 28 and 29, after which the table 27, if it is not already in proper position, is vertically adjusted to move the tool 22 into coöperative relation with, for instance, the grinding wheel 28, whereby the surface *e* of the tool 22 is properly and automatically ground. The table 27 is then actuated in the reverse direction to withdraw the tool 22 from engagement with the wheel 28 and the tool holder 12 is rotated on its axis to bring the designation 25 into registry with the graduation of the scale section *b* corresponding to the graduation of the section *a* with which it previously registered. In other words, in the illustrated example said designation 25 will be moved into registry with the graduation thirty of the scale section *b*, thus bringing the tool 22 into an angular position corresponding to that which it previously occupied but extending in the opposite direction. The slide 30 may then be shifted to bring the attachment to the other side of the machine, after which the table 27 is again actuated to move the tool 22 into coöperative relation, this time, with the grinding wheel 29 whereby the surface *f* of the tool 22 is also properly and automatically ground. Instead of shifting the attachment across the table into coöperative relation to the wheel 29, said attachment, after having being adjusted to its new position as described, may be moved to the opposite side of the wheel 28, so that both surfaces *e* and *f* of the tool 22 will be automatically ground by the same grinding wheel. During the actual grinding operation the attachment, with the tool therein, may be reciprocated relatively to the grinding means in the usual manner.

The attachment being arranged to be brought into coöperative relation either successively with each grinding wheel or in different relation to a single grinding wheel, and the graduations 26 bearing a predetermined relation to the active surfaces of the grinding wheels, it follows that the grinding action of the latter will always be in accordance with the adjustment of the tool holder so that the tool will always be automatically ground in the manner desired and

without any careful and periodical use of a gage to make sure that the intended result is being or has been attained. The same is true regardless of the type of grinding mechanism with which the attachment is used.

It will be understood that the description of the operation of the diagrammatically illustrated mechanism in Fig. 1 in connection with the attachment, is intended to illustrate how the latter may be used in connection with a grinding machine having a single grinding element and with a grinding machine having a plurality of such grinding elements. The particular grinding devices may be of any conventional type suitable for the purpose and form no part of my invention.

The attachment is simple in construction and arrangement and makes the grinding operation automatic and uniform in accordance with the results desired and without the necessity for any specially skilled attention. The attachment does away with the necessity for constantly and periodically checking up the grinding operation during its progress, by means of a gage as is now generally speaking the case and thus saves time and avoids the necessity for workmen specially skilled in grinding thread-cutting tools. Because of the axial inclination of the tool holder 12 the proper amount of clearance is also given to the cutting edge of the tool with the use of the attachment, in a simple manner.

To grind the cutting tool in a manner to adapt it for cutting truncated threads, the tool holder 12 is adjusted to a position in which the designation 25 registers with the uppermost zero graduation on the scale 26. This brings the tool to an upright position in which it is moved beneath the grinding wheel the action of which removes the apex of the tool and truncates the same to the desired extent.

The set screws 23 are located near the edges of the tool holder 12 in order that short and long tools and tools of intermediate lengths may be secured in the different sockets 21 with equal efficiency.

The attachment is reliable in action and reduces the art of grinding thread-cutting tools from a difficult operation requiring great skill to a proceeding which is entirely free from difficulties and is automatically carried out. The attachment may be used for grinding tools adapted to cut all kinds of V-threads, regardless of their shallowness or depth, truncated threads and in fact, threads of every description and type. Owing to the fact that the attachment may be used in connection with existing types of grinding machines, the cost of installation is relatively low as the attachment itself may be economically produced.

Various changes in the specific form shown and described may be made within the scope of the claims without departing from the spirit of my invention.

I claim:

1. An attachment of the kind described, comprising a support, a tool holder journaled thereon so as to be rotatably adjustable relatively to said support, the axis of said holder being inclined with respect to said support, means on said holder whereby the tool to be ground is supported thereon in a position radial and at right angles to the axis of said holder and means for securing said holder at any point of its rotary adjustment whereby said tool may be fixed in registry with any of the imaginary radii which may be projected from said axis.

2. An attachment of the kind described, comprising a supporting base, standards extending outwardly therefrom, a tool holder journaled between said standards so as to be rotatably adjustable relatively thereto, the axis of said holder being inclined with respect to said base; means on said holder whereby the tool to be ground is supported in a position radial and at right angles to the axis of said holder, means whereby said holder is clamped between said standards at any point of its rotary adjustment to fix said tool in registry with any of the imaginary radii, which may be projected from said axis and indicating means coincidental with said axis whereby the adjustment of said tool is indicated.

3. An attachment of the kind described, comprising a supporting base, standards extending outwardly therefrom, a tool holder journaled between said standards so as to be rotatably adjustable thereon, the axis of said holder being inclined with respect to said base, a plurality of means on said holder whereby tools of varying sizes may be supported in a position radial and at right angles to the axis of said holder, a clamp nut on the axis of said holder at one end, and coöperating with one of said standards to clamp said holder at any point of its rotary adjustment whereby the tool may be fixed in registry with any of the imaginary radii which may be projected from said axis, an indicator plate concentric with said axis and fixed thereon at the other end and a scale dial concentric with said axis and fixed upon one of said standards and coöperating with said indicator plate to indicate the adjustment of said tool.

In testimony whereof I have hereunto set my hand.

JACOB SZATMARY.