April 7, 1925. 1,532,167

E. WEILER

PENCIL SHARPENER

Filed April 17, 1924

Fig. 1

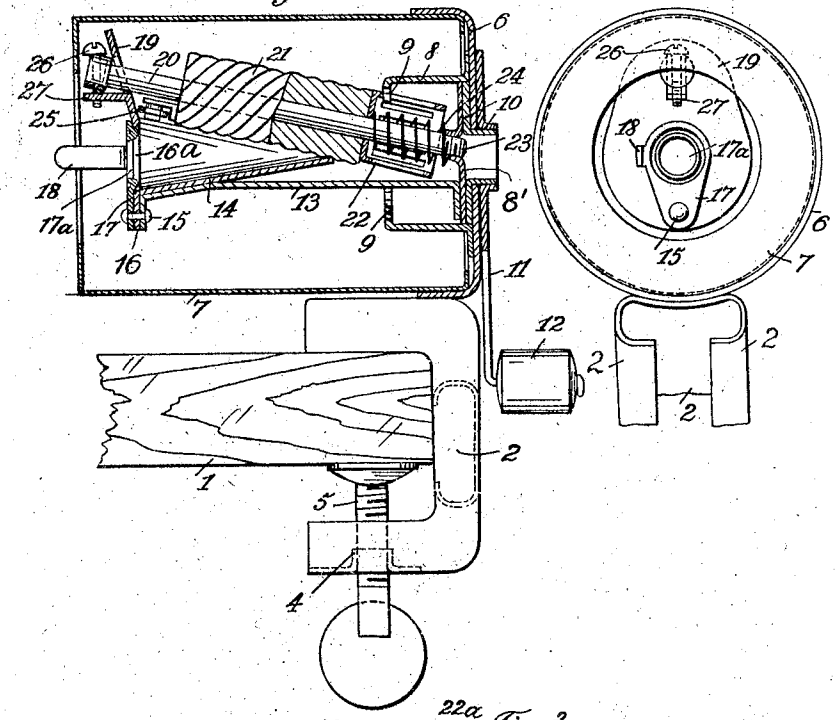


Fig. 2

Fig. 3

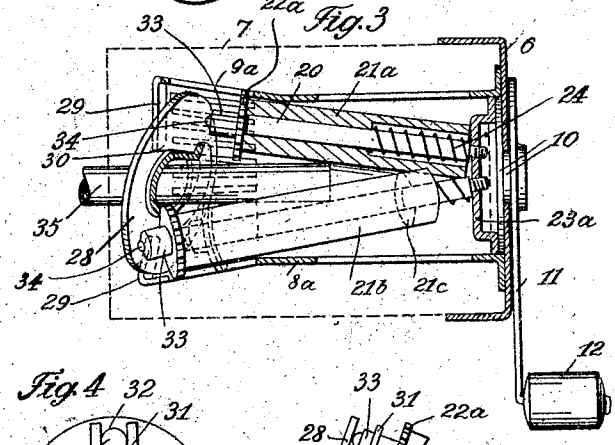
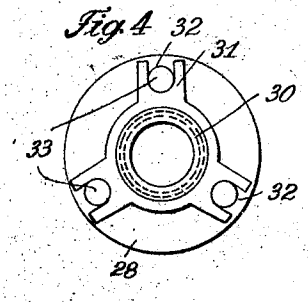


Fig. 4



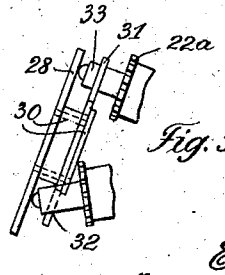


Fig. 5

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UNITED STATES PATENT OFFICE.

ERNST WEILER, OF BERLIN, GERMANY, ASSIGNOR OF ONE-HALF TO WEILER & CO., G. M. B. H., OF BERLIN, GERMANY.

PENCIL SHARPENER.

Application filed April 17, 1924. Serial No. 707,237.

To all whom it may concern:

Be it known that I, ERNST WEILER, a citizen of the German Republic, residing at Berlin, Germany, have invented certain Improvements in Pencil Sharpeners, for which I have filled an application in Germany on October 18th, 1922, and of which the following is a specification.

This invention relates to a pencil sharpener of the kind fitted with cutters which revolve about their own axes as well as about the pencil point, and the invention consists in the provision of means for imparting, in addition, an axial, reciprocating motion to the cutters so as to produce a very smooth cutting action.

Fig. 1 of the accompanying drawings represents a longitudinal section of the device,

Fig. 2, an end view of the same,

Fig. 3, a longitudinal section of a modified construction, and

Figs. 4 and 5, detail views of the latter construction.

The mechanical elements of the pencil sharpener are carried by a dished plate 6 which is secured in an upright position to a clamp 2, the latter being fitted with a screw-threaded socket 4 for the reception of a clamp screw 5 whereby the device can be fastened to a table top 1. A transparent cylinder 7, connected to the plate 6, encloses the elements. The plate 6 has a central aperture in which it accommodates a boss formed on a rotatable disc 10. The latter is arranged inside the plate 6, while an operating arm 11, fitted with a crank handle 12, is secured to the boss outside the plate.

In the construction according to Figs. 1 and 2, a ring 8, formed with an inturned, toothed flange 9, is rigidly secured to the plate 6, while a disc 8′ is connected to the disc 10 so as to rotate with the latter. The disc 8′ carries, at right angles, a plate 13 to which a conical shell 14 is attached as a guide for the pencil. An upright plate 16 secured to the free end of the plate 13, has an aperture 16^a through which the pencil is admitted. Another plate 17, which is adjustable about a pivot pin 15, has an aperture 17^a which registers with the aperture 16^a. By the adjustment of this plate, the effective area of the inlet aperture can be varied to suit pencils of different sizes. The adjustment of the plate 17 is effected by means of an arm 18 which projects through the end of the cylinder 7.

A milling cutter 21 is arranged loosely on a spindle 20 one end 23 of which is screwed into a socket formed on the disc 8′. The other end of the spindle is held in an aperture in an upward extension 19 of the plate 16, the spindle being held in an inclined position in conformity with the angle at which the pencil is to be cut. The spindle is supported by a bracket 27, bent off from the plate aperture, and its inclination can be regulated by means of an adjusting screw 26. The cutter is coaxial with a cylindrical shell 22 to which it is connected, the shell being slotted longitudinally so as to form ribs which are held in mesh with the teeth of the flange 9. Thus when the plate 13 and the spindle 20 are rotated about the pencil point by means of the handle 12, the cutter, while participating in the movement of the spindle, will also be rotated about its axis by the stationary gear 9.

According to the invention, the cutter is adapted for axial displacement on the spindle, and it is controlled by a spring 24 which is housed in the shell 22 and which bears against the disc 8′. The opposite end of the cutter bears, under the influence of the spring, against the plate 19 by means of a roller 25 which is connected to the cutter so as to participate in its rotation about the spindle. The plate 19 is set at an angle to the spindle 20, and the cutter will therefore be caused to change its position axially on the spindle in a reciprocating fashion as it rotates about its axis. A very favorable cutting action will thus result.

Figs. 3 to 5 show a modified device in which three cutters 21^a, 21^b and 21^c are employed. These are held rotatably and slidably on spindles 20 which are secured to the disc 10 through the medium of an offset plate 23^a. The spindles are spaced uniformly and arranged relative to each other at an angle which corresponds with the pencil point. The cutters are drilled from one end to receive the spindles as well as a spring 24. The opposite end of each cutter is fitted with a pinion 22^a which meshes with ribs formed by slots made in a conical portion 9^a of a cylinder 8^a, the latter being secured to the plate 6. The cutters are sup-

ported, in opposition to the springs, by a disc 28 which is arranged obliquely within the cylinder portion 9^a and held in position by lugs 29 which are bent off from the cylinder wall. The disc 28 has an aperture through which the pencils are inserted, and a flanged nipple 30 is arranged about the aperture as a guide for a spider 31 which supports the free ends of the cutters and rotates with the latter about the pencil. The cutters are formed with journals 33 which rest in notches 32 made in the arms of the spider, and balls or rollers 34 at the extreme ends of the cutters bear against and travel on the surface of the oblique disc 28 so as to impart an axial, reciprocating motion to the cutters while they are circulated by means of the handle 12 about the pencil point. The pinion 22^a impart a rotary motion to the cutters while participating in their axial displacement.

I claim:

1. In a pencil sharpener of the character described, the combination with cutters adapted to revolve about their axes as well as about the pencil point, of springs tending to impart axial motion to the cutters, and a plate arranged so as to oppose such motion, the plate being arranged obliquely relative to the axis of rotation of the cutters so as to impart an axial reciprocating motion to the cutters in cooperation with the springs.

2. In a pencil sharpener of the character described, the combination with three spindles arranged at an angle in fixed relationship to each other, milling cutters arranged loosely on said spindles, means for rotating said spindles and cutters about the pencil point, means for imparting to said cutters rotary motion about their axes while circulating round the pencil point, springs tending to impart axial motion to the cutters, and a plate arranged so as to oppose such axial motion, the plate being arranged at an angle relative to the axis about which the spindles rotate so as to impart an axial reciprocating motion to the cutters in cooperation with the springs.

ERNST WEILER.