Aug. 22, 1950 A. SOLLOSY ET AL 2,520,020

ELECTRIC SHARPENER OR CUTTER

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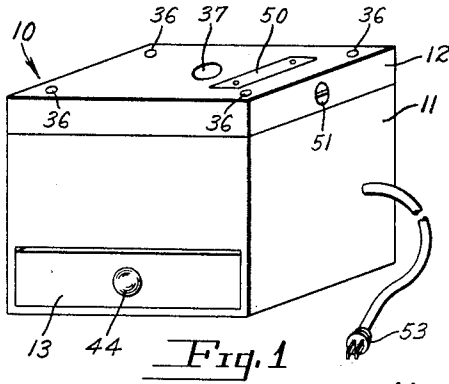


Fig. 1

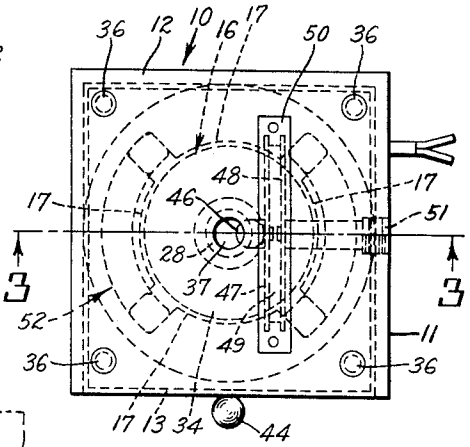


Fig. 2

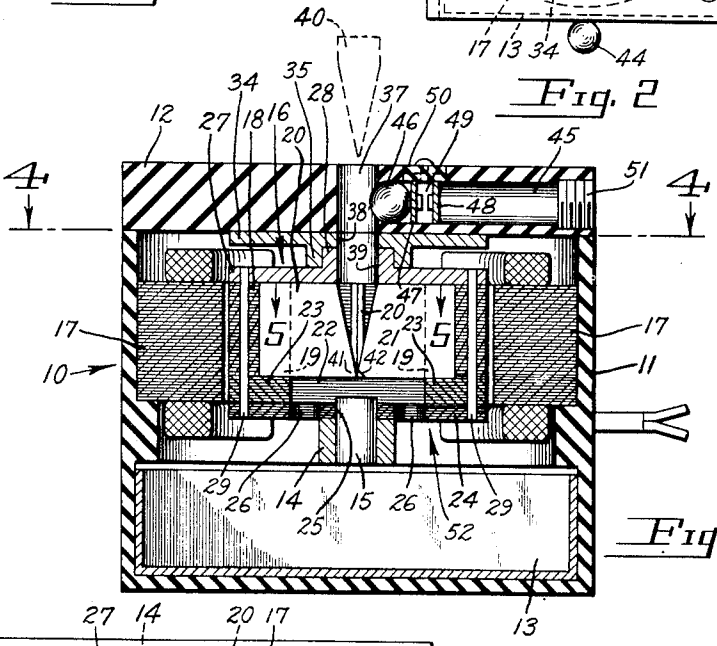


Fig. 3

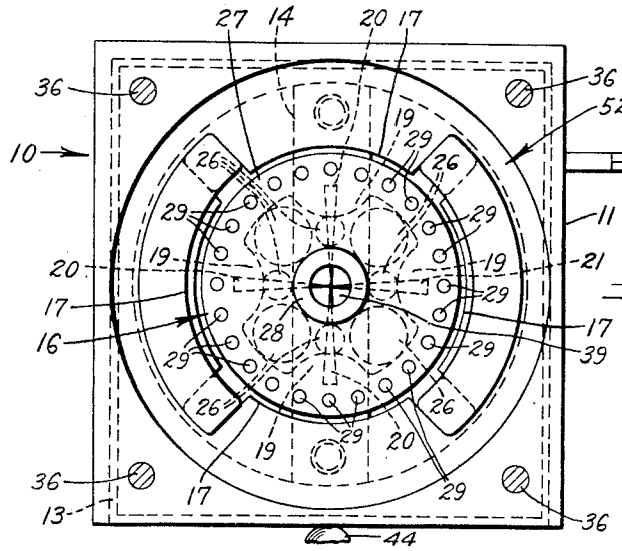


Fig. 4

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ELECTRIC SHARPENER OR CUTTER

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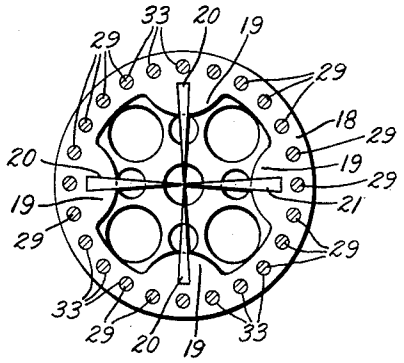


Fig. 5

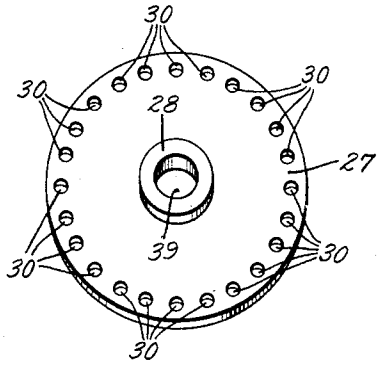


Fig. 6

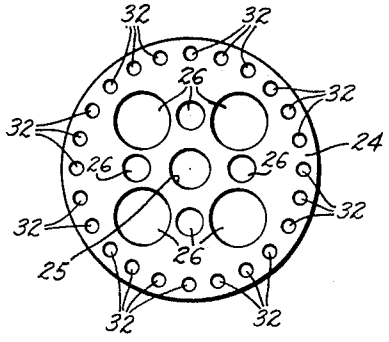


Fig. 7

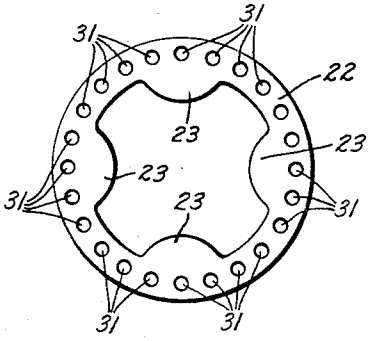


Fig. 8

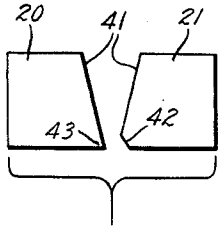


Fig. 9

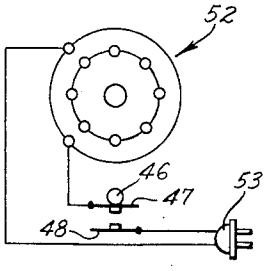


Fig. 10

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ELECTRIC SHARPENER OR CUTTER

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Application March 4, 1947, Serial No. 732,150

4 Claims. (Cl. 120—96)

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This invention relates to new and useful improvements in electrically driven cutters or tools.

An object of the invention is to provide an electrically operated or driven cutter or tool device wherein the cutters or other tools are mounted directly in the armature of an electric motor.

Other objects and advantages of the invention will become apparent from a consideration of the following detailed description taken in connection with the accompanying drawings wherein a satisfactory embodiment of the invention is shown. However, it is to be understood that the invention is not limited to the details disclosed but includes all such variations and modifications as fall within the spirit of the invention and the scope of the appended claims.

In the drawings:

Fig. 1 is an isometric view showing one embodiment of the invention;

Fig. 2 is a top plan view of the device of Fig. 1;

Fig. 3 is a sectional view taken as along the line 3—3 of Fig. 2 but showing the device on an enlarged scale;

Fig. 4 is a view taken as along the plane of the line 4—4 of Fig. 3;

Fig. 5 is a plan view of the motor armature with the cutter blades therein;

Fig. 6 is an isometric view of a cover and bearing plate for the armature;

Fig. 7 is a plan view of one of the laminations forming the bottom bearing means for the armature;

Fig. 8 is a similar view of an intermediate lamination;

Fig. 9 shows the two types of cutter blades involved; and

Fig. 10 shows a wiring diagram.

In the present instance, the invention is shown as incorporated in a pencil sharpener of a type adapted to be placed flat on a desk top or other support and to be shifted about as may be desired. However, we do not wish to limit ourselves to the embodiment or the incorporation of the invention in a pencil sharpener as we contemplate other uses for the same. For example, we contemplate that the principles of the invention may be used in the head stock of a lathe with cutting tools mounted directly in the armature or with the armature mounting a chuck or the like. From this, it will be seen that the invention has rather wide application but in the present instance is illustrated in a preferred application as part of a pencil sharpener

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providing a pencil sharpener of novel construction.

Referring in detail to the drawings, the pencil sharpener generally designated 10 is shown as comprising a body 11 and a cover or closure 12, each of insulating material, as of any suitable plastic. The body 11 is substantially hollow and in its lower portion is shown as receiving a drawer 13 adapted to receive the chips and the like resulting from a pencil sharpening operation. At any time, this drawer may be simply slid out of the body, emptied into a waste basket or the like, and then slid back in place in the body.

Above the drawer, a supporting device, as a bar or spider or the like 14, extends across the body and mounts a shaft 15 comprising a bottom bearing for an armature 16 of an electric motor shown as including a pair of poles 17. It will be apparent that the invention is not limited to the use of a two-pole motor. The armature 16 comprises a stack of laminations 18, each being somewhat in ring form but having four inwardly directed enlargements or bosses 19 each provided with a dove-tailed or tapered slot 20 receiving the thickened or butt portion of a blade 21. Sufficient of the laminations 18 are used to provide a stack of the desired height and the blades 21 are each of a length equal to the height of the said stack.

Then, below the laminations 18 are a lesser stack of laminations 22 each also comprising a ring-like structure having four inwardly directed bosses 23. In the assembled armature, the bosses 23 of the laminations 22 are located immediately under the bosses 19 of the laminations 18 whereby the bosses 23 close the lower ends of the slots 20 forming bottom supports for the blades 21. Below the laminations 22 is a shallow stack of laminations 24 each provided with a center hole 25 and provided with a series of other holes 26.

The holes 25 of the stack of laminations 24 align and receive the upper end of the bearing stud 15 for the mounting of the lower end of the armature 16. In the use of the device, the holes 26 provide for the escape of chips and the like from the armature into the little drawer 13. Armature 16 also includes a combined top plate and bearing member 27 shown in the form of a casting comprising a disc-like body portion and an upwardly extending neck 28.

All of the laminations and the top bearing member 27 are held in assembled relation by means of copper bars or wires 29 passing through

registering openings in the various laminations and in the combined top and bearing member 27. These openings in such top member are designated 30 and in the laminations 22 are designated 31 and in the laminations 24 are designated 32, while in the main body of laminations they are designated 33.

The field of the motor is mounted by the housing 11 while the armature at its lower end is supported on the cross piece or bar 14 and is centered by the shaft 15, as previously explained. The cover or top 12 of the housing, at its underside, is provided with a metal plate 34 having a downwardly extending annular flange or neck 35. The inner diameter of this neck 35 is such as to receive the upwardly extending neck 28 of the armature top member 27 and to center and provide a bearing for the same. Thus, it will be seen that the plate 34 and particularly the annular flange 35 of said plate forms a top centering and bearing member for the armature 16.

While the top 12 of the casing may be secured in any desired manner, it is here shown as held in place by four bolts 36 passing upwardly through the corner portions of the body 11 and threaded into the top from the underside thereof. The cover 12 has an opening 37 which aligns with a central opening 38 through the plate 34 and with a central opening 39 through the neck 28 of the armature top or cover plate. These aligned openings provide for the insertion of an article, as for example, a pencil as suggested by the dotted lines 40 in Fig. 3, into the sharpener to be engaged by the blades 21.

As will be clear from the several figures of the drawings, these blades are arranged at ninety degrees to one another, four blades being illustrated, and at their adjacent edges the blades are cut away or bevelled as at 41 so that looking from the side at any two blades, a deep V is formed. While four blades 21 are shown as mounted in the armature, it will be clear that the invention is not limited to such number. Additional blades or less blades may be employed.

Clearly, the intermediate laminations 22 hold the blades against downward movement through the stack of the laminations 18 and the cover 27 prevents the blades working upwardly. Thus, the blades are held in the armature and will be rotated with the latter. Therefore, after the motor is energized so that the armature is rotating, when a pencil is inserted through the registering openings 37, 38 and 39, the pencil will be engaged by the blades and pointed.

Three of the blades 21 have their lower forward corner portions removed or omitted, as suggested at 42, while the fourth blade comes down to a point, as suggested at 43. Thus, when a pencil is inserted in the sharpener, all of the blades (four being shown) will engage the pencil at a place beginning above the lower end of the pencil, that is, above the lead of the pencil, and extending upwardly therefrom. The extreme lower portion of the pencil, that is, the lead portion of the pencil, will be engaged only by one of the blades, that being the blade which extends to the point 43. Thus, we have a plurality of blades working on the wooden portion of the pencil and but a single blade to sharpen the lead of the pencil.

If all of the blades were continuous or were not cut away as at 42, the lead would be constantly entirely removed and a successful sharpening operation would be prevented. As the blades cut the pencil, the chips and the like fall down through the laminations 18 and 22 in the spaces between the bosses or enlargements 19 and 23 and then pass through the various openings 26 in the laminations 24 into the drawer 13. As a matter of convenience in handling the drawer, the latter is shown as being provided with a small handle or pull knob 44.

Means are provided for automatically closing a circuit to the motor when a pencil is inserted to be sharpened. To this end, a hole 45 is formed in or drilled through the cover 12 from one edge thereof and the hole partly enters the opening 37. Then a sphere, as the metal ball 46, is passed through this opening or hole 45 and partly enters the passageway or opening 37.

Thereafter, through an opening in the top wall of cover 12, a pair of contacts 47 and 48 are placed across the opening 45 in an elongated slot 49. The contact 47 engages the ball 46 and normally keeps it in position, projecting partly into the passageway 37. The contact 48 is normally spaced from the contact 47. As shown, a cover piece 50 covers the slot through which the contacts are passed for mounting in the cover 12. Further, the outer end of the hole 45 is shown as closed by a plug 51.

With reference to the diagram of Fig. 10 wherein the motor is generally designated 52, it will be seen that the contacts 47 and 48 are included in the motor circuit. When the sharpener is to be used, the plug cap 53 is connected with a suitable outlet and the pencil sharpener is ready for use. Then, when a pencil is moved into the passageway 47, it engages the ball 46, as the same partly projects into said passageway, and forces the ball laterally bowing the contact 47 to bring its point or lug into engagement with that of contact 48 thereby closing the circuit to the motor 52.

The motor operates and its armature 16 revolves carrying the blades 21 to sharpen the pencil. When the pencil is removed from the passageway 37, contact 47 springs back to normal position out of engagement with contact 48 opening the motor circuit and returning the ball 46 to normal position. Thus, the motor is automatically de-energized but the sharpener is ready for instant use on the insertion of a pencil into the passageway 37.

Having thus set forth the nature of our invention, what we claim is:

1. An armature for use in a device of the character described, said armature comprising a body of laminations each having a plurality of inwardly directed bosses having slots, the bosses and slots of said laminations being aligned to form laminated slotted bosses, a cutter blade having a butt engaged in the slot of each of said laminated slotted bosses and having a projecting cutting edge, a group of laminations at one end of said body of laminations and having bosses closing the inner ends of the slots of said laminated slotted bosses, a third group of laminations at the outer side of the second group of laminations, said laminations of the third group having an aligned central opening therethrough for the reception of the bearing shaft and having discharge openings about said central opening, a cover piece and end bearing member against the other end of said body of laminations, and metal tie-rods passing through all of said laminations and said cover and end bearing member and securing all of said elements together.

2. An armature for use in a device of the char-

acter described, said armature comprising a substantially ring-shaped body having a tool receiving slot extending along its inner wall surface between its upper and lower ends, a tool having a butt engaged in said slot and having an inwardly projecting work performing portion, and retaining means secured at the upper and lower ends of said body closing the upper and lower ends of said slot to retain said tool therein.

3. An armature for use in a device of the character described, said armature comprising a substantially ring-shaped body having a tool receiving dove-tail slot, extending along its inner wall surface between its upper and lower ends, a tool having a dove-tail butt engaged in said slot and having an inwardly projecting work performing portion, and retaining means secured at the upper and lower ends of said body closing the upper and lower ends of said slot to retain said tool therein.

4. An armature for use in a device of the character described, said armature comprising a substantially ring-shaped laminated body having a

tool receiving slot extending along its inner wall surface between its upper and lower ends, a tool having a butt engaged in said slot and having an inwardly projecting work performing portion, upper and lower plate members engaged with the upper and lower ends of said body closing the upper and lower ends of said slot to retain said tool therein, and tie rods connecting said plate members and passing through said laminated body.

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