Nov. 3, 1953 W. E. ANGELL 2,657,672

AUTOMATIC MOTOR-DRIVEN PENCIL SHARPENER

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Fig.1

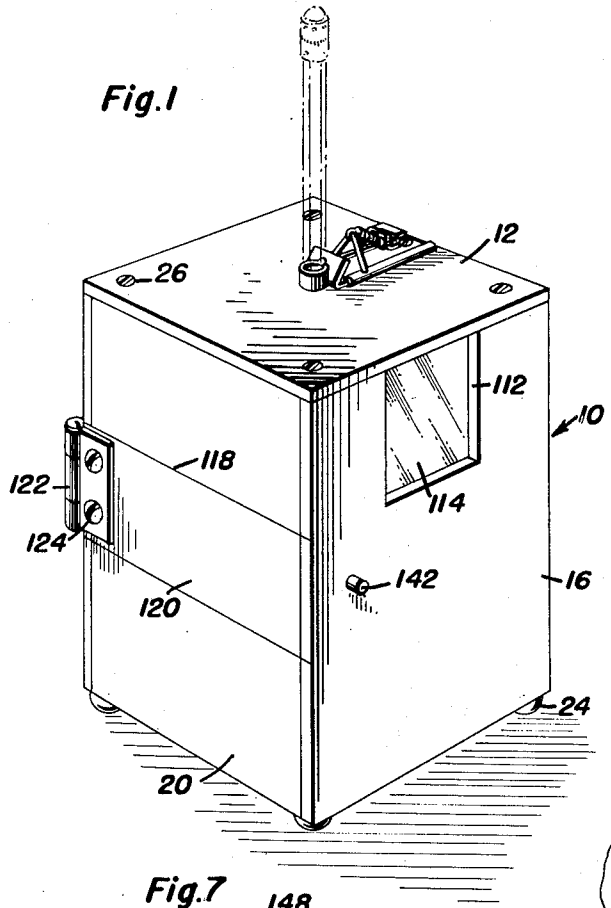


Fig.9

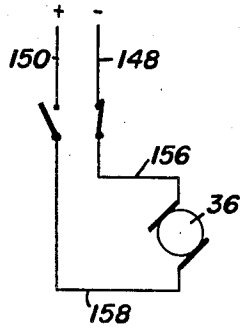


Fig.7

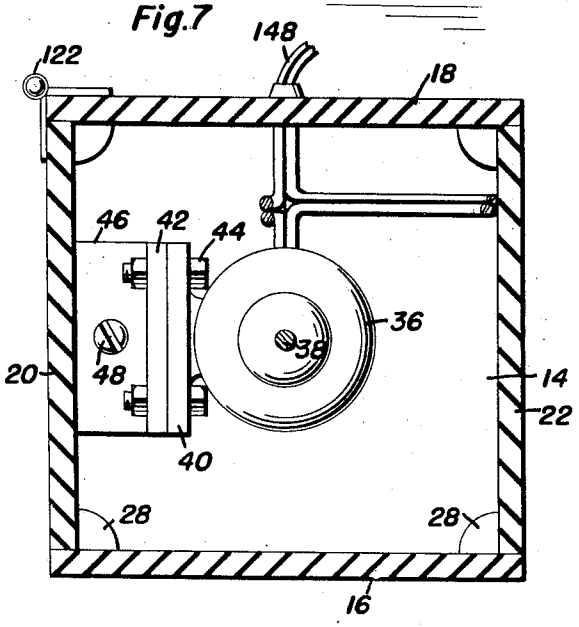
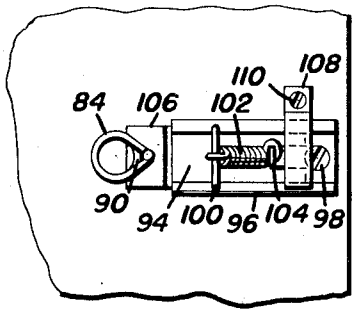


Fig.8



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AUTOMATIC MOTOR-DRIVEN PENCIL SHARPENER

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Fig.2

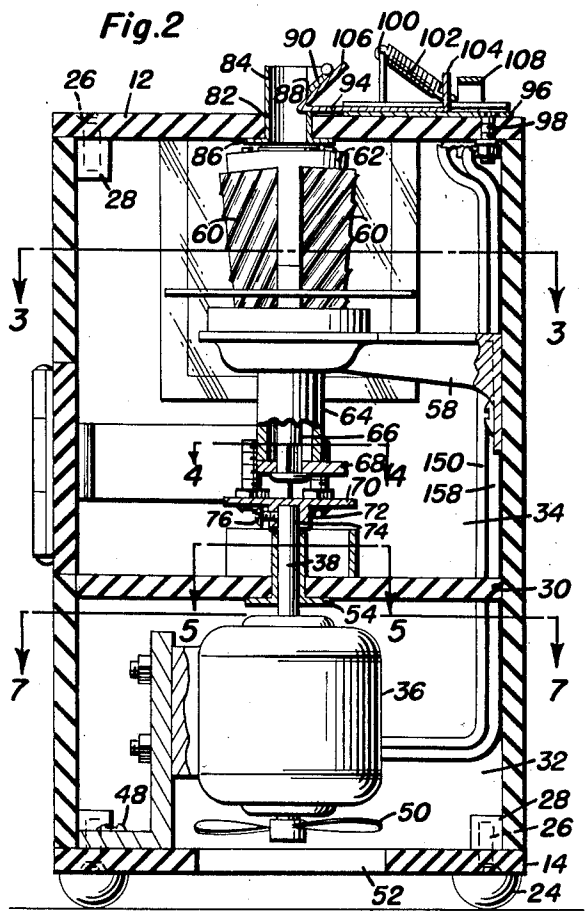


Fig.3

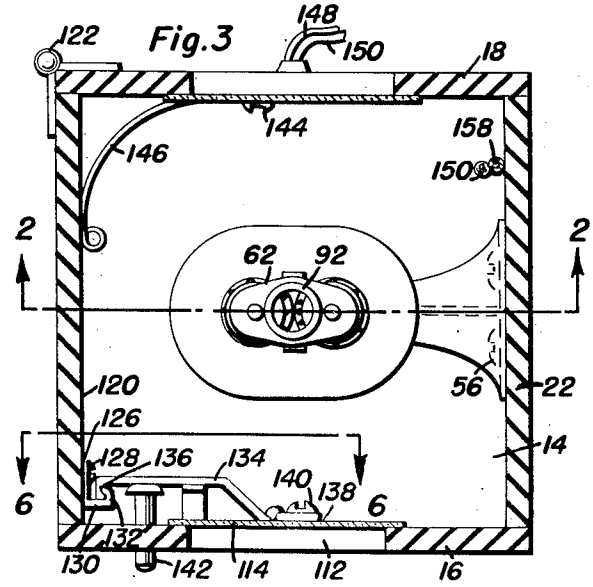


Fig.4

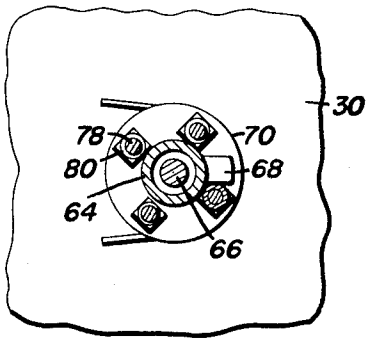


Fig.5

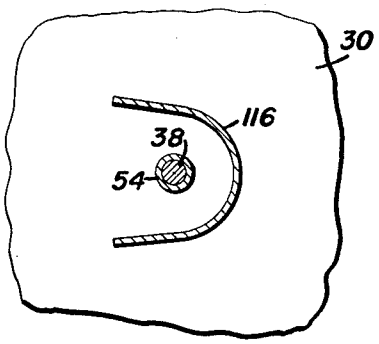
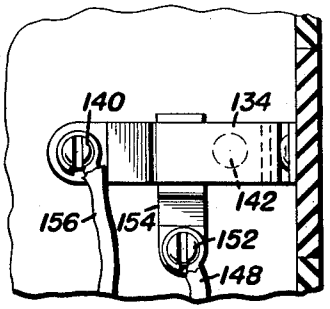


Fig.6



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AUTOMATIC MOTOR-DRIVEN PENCIL SHARPENER

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2 Claims. (Cl. 120—96)

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This invention relates generally to a pencil sharpener, and more particularly to a pencil sharpener which is powered by an automatic motor drive means.

The primary object of this invention is to provide an improved electric pencil sharpener in which cutting blades are automatically rotated by an electric motor upon application of a pencil between the cutting blades.

Another object of this invention is to provide an improved automatic motor driven pencil sharpener having a guide for aligning pencils with the cutting blade, and switch means for the electric motor associated with the guide.

Another object of this invention is to provide an improved automatic motor driven pencil sharpener having switch means which automatically start the electric motor when a pencil is inserted between the cutting blades, and automatically shuts off the electric motor when the pencil is removed from between the cutting blades.

Another object of this invention is to provide an improved automatic motor driven pencil sharpener having a compartment for receiving the shavings cut from pencils in the process of sharpening them, and when the means in said compartment for determining the amount of shavings within the compartment.

Another object of this invention is to provide a shaving compartment for a pencil sharpener, said shaving compartment having a door for emptying same, and latch means for retaining the door in closed position.

A further object of this invention is to provide an improved housing for an automatic motor driven pencil sharpener having a compartment for receiving the motor and a separate compartment for receiving the cutting blades and shavings cut from pencils in the process of sharpening them.

With these objects definitely in view, this invention resides in certain novel features of construction, combination and arrangement of elements and portions as will be hereinafter described in detail in the specification, particularly pointed out in the appended claims, and illustrated in the accompanying drawings which are a material part of this application, and in which:

Figure 1 is a perspective view of the improved automatic motor driven pencil sharpener, which is the subject of this invention, a pencil being shown disposed within the pencil receiving guide, the pencil being illustrated by dotted lines;

Figure 2 is an enlarged central transverse vertical sectional view through the automatic motor driven pencil sharpener of Figure 1 and taken substantially upon the plane indicated by the section line 2—2 of Figure 3, and showing the internal construction of the motor and the cutting blades;

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Figure 3 is a transverse horizontal sectional view taken substantially upon the plane indicated by the section line 3—3 of Figure 2 and showing the manner in which the cutting blades are mounted in the housing, and the specific construction of the door latching means;

Figure 4 is a fragmentary horizontal sectional view taken substantially upon the plane indicated by the section line 4—4 of Figure 2 and showing the connection between the electric motor and the cutting blades of the pencil sharpening portion;

Figure 5 is a fragmentary transverse horizontal sectional view taken substantially upon the plane indicated by the section line 5—5 of Figure 2 and showing the construction of a guard for preventing shavings from coming into engagement with the motor shaft;

Figure 6 is a fragmentary transverse vertical sectional view taken substantially upon the plane indicated by the section line 6—6 of Figure 3 and showing the construction of the latch means for the door through which the shavings are removed, and showing the specific relation of the electrical contacts associated therewith;

Figure 7 is a transverse horizontal sectional view taken substantially upon the plane indicated by the section line 7—7 of Figure 2 and showing the manner in which the electric motor is disposed within the housing, and the arrangement of the wiring thereto;

Figure 8 is a fragmentary top plan view of the housing and showing the construction of the guide means for a pencil and its associated switch for automatically operating the electric motor; and,

Figure 9 is a schematic diagram of the electrical circuit for the motor of the pencil sharpener.

Similar characters of reference designate similar or identical elements and portions throughout the specification and throughout the different view of the drawings.

Referring now to the drawings in detail, this invention includes a housing which is generally referred to by the reference numeral 10. The housing 10 has a top wall 12, a bottom wall 14, front and rear side walls 16 and 18, respectively, and end walls 20 and 22. Carried by the bot-

tom wall 14 adjacent the corners thereof are a plurality of semi-spherical rubber supporting elements 24.

Referring now to Figures 2 and 7, it will be seen that the top and bottom walls 12 and 14, respectively, are secured to the end and side walls by a plurality of conventional fasteners 26 which are threadedly secured to connecting blocks 28 mounted in the corners formed by intersecting side and end walls. The housing 10 is provided with a transverse partition wall 30 which divides the housing into a motor compartment 32 and a cutting blade and shaving receiving compartment 34.

Mounted within the motor compartment 32 is an electric motor 36 having an armature shaft 38 and a mounting base 40. The mounting base 40 of the electric motor is secured to an upstanding flange 42 of an L-shaped bracket by a plurality of bolts 44. A horizontal flange 46 of the motor mounting bracket is secured to the bottom wall 14 of the housing by a plurality of screws 48.

Referring now to Figure 2 in particular, it will be seen that the lower end of the armature shaft 38 is provided with a fan 50 for cooling the electric motor 36. The fan 50 is in alignment with an enlarged opening 52 in the bottom wall 14. The upper end of the armature shaft 38 is journaled in a flange bushing 54 carried by the partition wall 30 in alignment with the electric motor 36.

Mounted within the cutting blade compartments 34 and secured to the inner side of the end wall 22 by screws 56 is a conventional pencil sharpener mounting support 58. Referring to Figure 2 in particular, it will be seen that the mounting support 58 is disposed horizontally instead of in its usual vertical position. Rotatably carried by the mounting support 58 are a pair of cutting blades 60 which are rotatably journaled between the mounting support 58 and a bracket 62 carried by the support 58. Extending downwardly from the support 58 is a tubular bushing 64 in which is rotatably mounted a driveshaft 66. The cutting blades 60 are connected to the driveshaft 66 by conventional gear means (not shown). Rigidly secured to the end of driveshaft 66 is a portion of a crank handle 68 for driving the driveshaft 66. It will be understood that the mounting support 58, the blade 60, the driveshaft 66, and the other associated elements are parts of a conventional pencil sharpener.

Referring now to Figures 2 and 4 in particular, it will be seen that carried by the upper end of the armature shaft 38 is a plate 70 having a boss 72 on its underside. The boss 72 has a centrally disposed bore 74 in which is received the upper end of the armature shaft 38. The armature shaft 38 is maintained within the bore 74 by a locking screw 76 carried by the boss 72. Carried by the plate 70 is a plurality of upstanding arms in the form of threaded bolts 78 which are secured to the plate 70 by nuts 80. The short portion of the handle 68 is disposed between adjacent bolts 78 so that when the bolts 78 are rotated by the motor 36, the handle 68 is also rotated in order that the driveshaft 66 may drive the cutting blades 60.

Referring now to Figures 2 and 8, it will be seen that the top wall 12 is provided with a central aperture 82 in which is mounted a guide member 84. The guide member 84 is provided at its lower end with a flange portion 86 bearing against the underside of the top wall 12. Adjacent the upper surface of the top wall 12, are the

guides 84 divided with an opening 88 in one side thereof and an outwardly flared wall portion 90. It will be noted that the guide 84 is in alignment with an aperture 92 through the bracket 62 of the pencil sharpener for receiving a pencil. Extending through the opening 88 in the guide 84 and in sliding relation thereto is a sliding contact 94. The sliding contact 94 is slidably mounted in a guide 96 secured to the top wall 12 by a bolt 98. The guide 96 is provided with a U-shaped bracket 100 which overlies the sliding contact 94 and is provided with a tension spring 102 connected to an upstanding tab 104 on the sliding contact 94 and urging the contact toward the guide 84. The sliding contact 94 is provided with an upwardly and rearwardly directed flange 106 for engaging the outwardly flared side wall portion of the guide which also acts as a stop member and limits the inward motion of the sliding contact 64 through the opening 88 in the guide 84.

Also carried by the top wall 12 is a V-shaped contact 108 which is rigidly secured to the top wall by a bolt 110 in fixed relation thereto and having a flange overlying the guide 96 and the sliding contact 94. Referring to Figure 2, we readily see that when a pencil is moved downwardly through the guide 84 towards the pencil sharpener, that the pencil will engage the flange 106 and move the sliding contact 94 to the right and out of the opening 88 in the guide 84. When the sliding contact 94 moves to the right, the tab 104 engages the overlying flange of the fixed contact 108 and completes a circuit to the electric motor 36. The wiring detail of the electric motor will be described in more detail hereinafter.

In order that it may be determined when the compartment 34 is filled with shavings, the front wall 16 is provided with a window opening 112 which is closed by a sheet of transparent plastic 114 secured to the inner side of the front wall 16.

In order that the shavings disposed in the compartment 34 will not clog the bushing 54 on which the armature shaft 38 rotates, there is secured to the upper side of the partition wall 30 a U-shaped guard 116 which partially surrounds the upper end of the bushing 54 and the armature shaft 38.

In order that the compartment 34 may be emptied of shavings periodically, the end wall 20 is provided with an opening 118 which is closed by a hinged door 120. The door 120 is carried by a conventional hinge 122 which is secured to both the door 120 and the rear wall 18 by conventional fasteners 124.

Referring now to Figure 3 in particular, it will be seen that the door 120 is provided with a keeper member having a flange 126 secured to the inner side of the door by a screw 128. Extending normal to the flange 126 is a second flange 130 terminating in a lip portion 132. Secured to the front wall 16 is a spring latch 134 having a lip portion 136 in engagement with the lip 132, and an offset flange portion 138 secured to the inner side of the front wall 16 by the screw 140. Also carried by the front wall 16 in alignment with the spring latching member 134 is a headed rod member 142 by which the latching member 134 may be released from the keeper carried by the door 120. Secured to the rear wall 18 by a screw 144 is a leaf spring 146 which engages the inner side of the door 120, and urges the door to an open position.

The housing **10** is provided with a pair of lead-in wires **148** and **150** which are adapted to being connected to any convenient electrical source. Referring to Figure 6 in particular, it will be seen that the lead-in wire **148** passes through the housing **10** and is secured to a screw **152** which also secures a fixed contact **154** to the front wall **16** in a position underlying the spring latching member **134**. The fixed contact **154** is normally in contact with the spring latching member **134** when the door **120** is in its closed latched position. Secured to the spring latching member **138** by the screw **140** is a wire **156** which is secured to one of the terminals of the motor **36**.

The other lead-in wire **150** extends upwardly through the partition wall **130** and is secured to the fixed contact **108** by the bolt **110** carried by the top wall **12** of the housing. A wire **158** is secured to the bolt **98** which secured the guide **96** to the top wall **12** and extends through the partition wall **30**, and is connected to the other terminal of the motor **36**.

As will be readily seen by referring to the wiring diagram of Figure 9, the switch formed by the latch members of the door **120** are normally closed, and the switch associated with the guide means **84** carried by the top wall **12** is normally open. When a pencil is disposed within the guide **84**, the sliding contact **94** engages the fixed contact **108** and closes the circuit thereby supplying current to the electric motor **36** which in turn revolves the cutting blades **60** to sharpen the pencil disposed within the guide **84** and between the blades. However, when the rod **142** is pushed inwardly to disengage the latching member **134** from the keeper carried by the door **120** in order to open the door **120**, the switch portion of the latch is opened and the circuit to the motor **36** is broken. By the use of the switch attached to the latch means for the door **120** injury to the hand is prevented as the cutting blades **60** will not be operated by the motor **36** even if a pencil is disposed within the guide **84** as long as the rod **142** is remained pressed down to break the contact between the spring latching member **134** and the fixed contact **154**.

It will be noted that the housing **10** is formed of a plastic material or some other similar material having insulating properties due to the fact that the screws which are part of the electrical circuit are secured directly to the sides and top walls of the housing.

The operation of this machine will be understood from the foregoing description of the mechanical details thereof, taken in connection with the above recited objects and the drawings. Further description would appear to be unnecessary.

Minor modification of the machine, varying in minor detail from the embodiment of the machine illustrated and described here, may be resorted to without departure from the spirit and scope of this invention, as defined in the appended claims.

Having described the invention, what is claimed as new is:

1. For use in an electric pencil sharpener of the type having a motor driven cutter and a pencil guide carried by a wall of an enclosing housing in alignment with the cutter; a control switch adapted to control operation of the motor, said control switch being mounted on said wall and operatively associated with said pencil guide, said control switch comprising a fixed contact carried by said wall, a movable contact slidably mounted on said wall, said movable contact having an end portion slidably disposed in an opening in said pencil guide for engagement by a pencil, said guide being outwardly flared to form a stop, said end portion including an upwardly and rearwardly disposed flange normally engaging said stop, a spring member connected to a second flange at an opposite end of said movable contact for urging the same towards said pencil guide.

2. The switch of claim 1 wherein said second flange is positioned in alignment with and adjacent said fixed contact for engagement therewith upon movement of said movable contact by a pencil inserted in said pencil guide.

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