Dec. 6, 1966 A. GINSBERG 3,289,641

PENCIL SHARPENER

Filed April 29, 1966 2 Sheets-Sheet 1

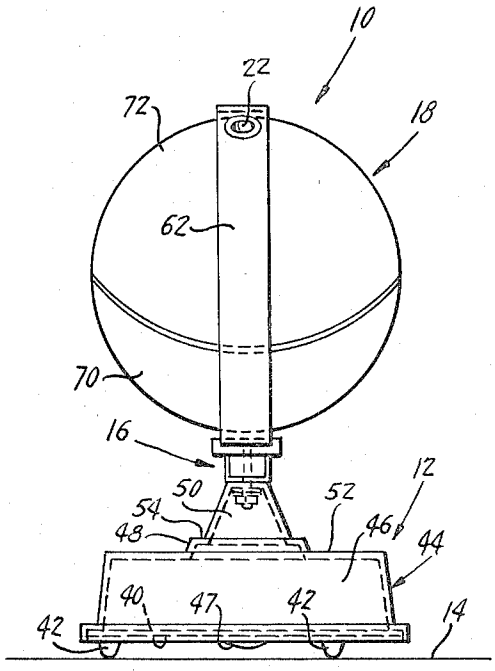


FIG. 2

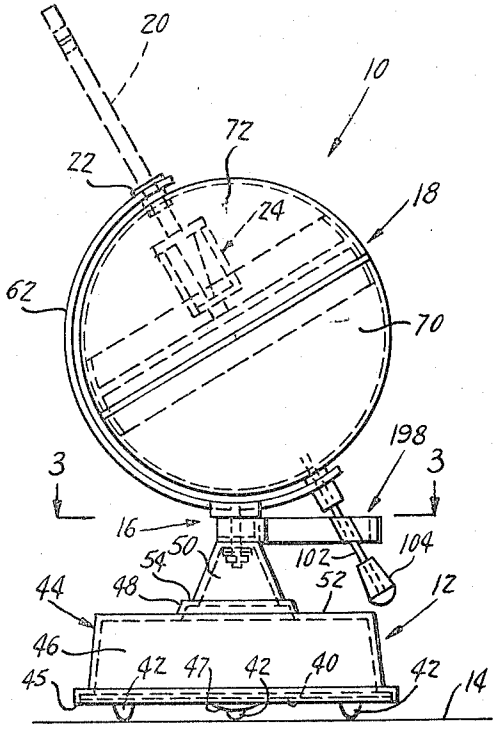


FIG. 1

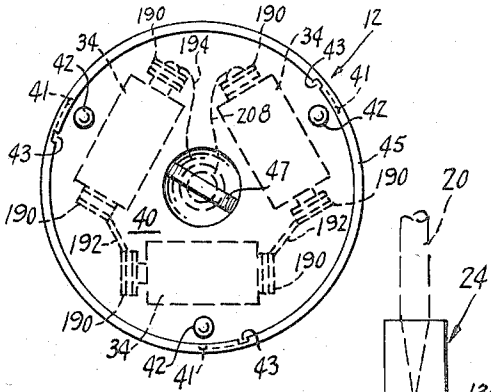


FIG. 4

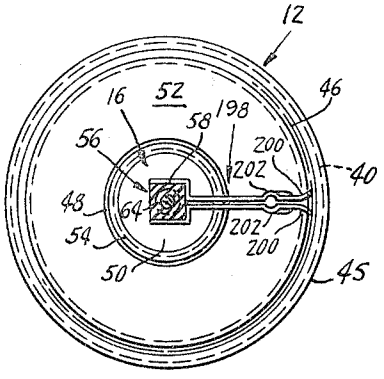


FIG. 3

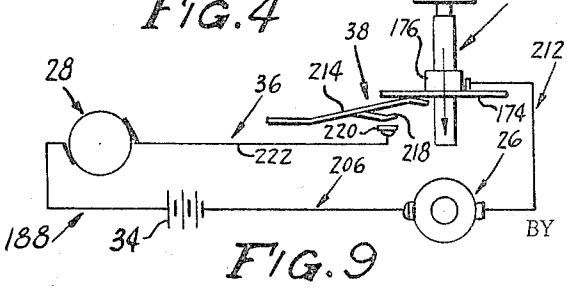


FIG. 9

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PENCIL SHARPENER

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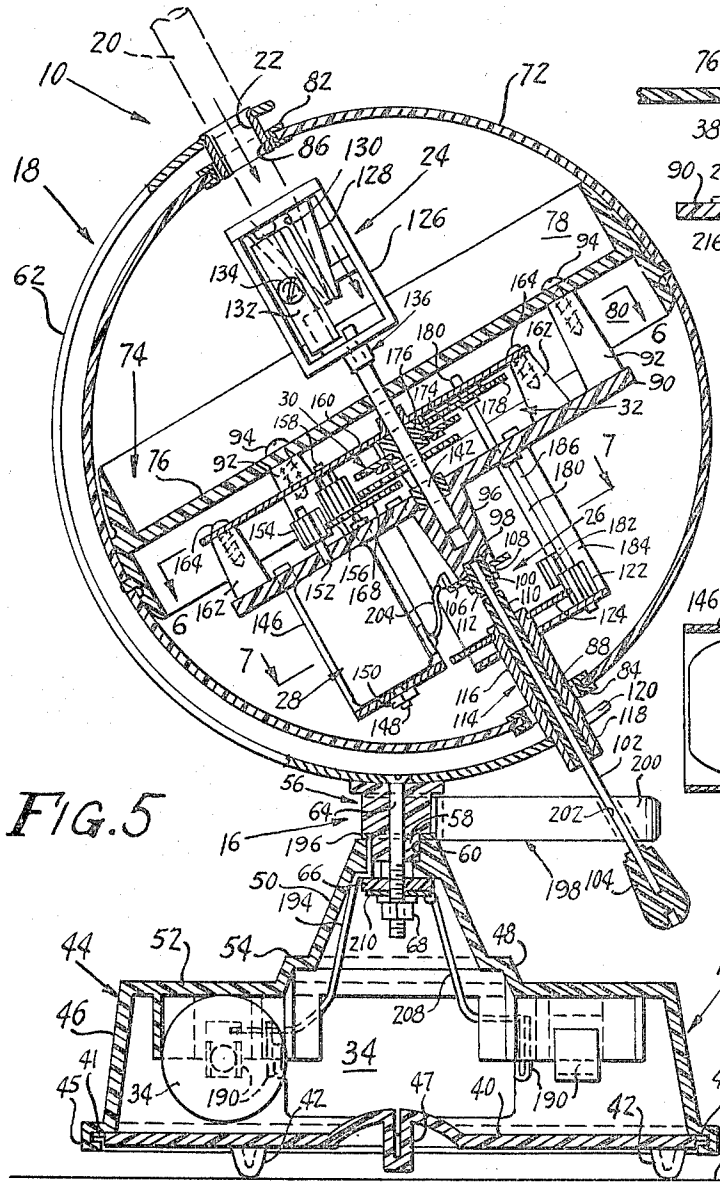


FIG. 5

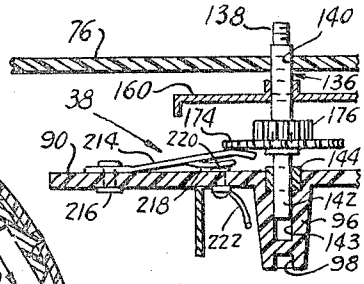


FIG. 8

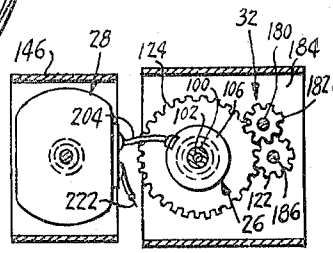


FIG. 7

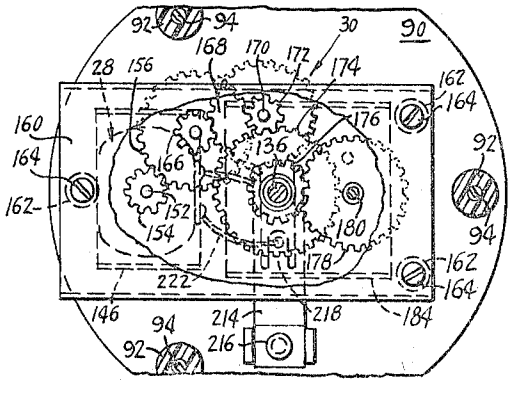


FIG. 6

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3,289,641

PENCIL SHARPENER

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Filed Apr. 29, 1966, Ser. No. 546,400
9 Claims. (Cl. 120—96)

This invention relates to pencil sharpeners, and more particularly to a novelty type pencil sharpener.

In summary, the instant invention comprises a hollow housing rotatably mounted on a base with a point sharpening element interiorly of the housing. Means are provided to rotate the pencil sharpening element at a first rate of speed and to rotate the housing at a lesser rate of speed. It is readily apparent that the rotation of the pencil sharpening element performs the desired function of the device while the rotation of the housing produces the desired novelty effect. It is preferred that the power source be actuated by the insertion of a pencil through the housing into the point sharpening element.

It is, of course, well known in the art to provide pencil sharpeners in which the sharpening element is rotated by an electric motor actuated by the insertion of the pencil into the sharpener. Exemplary of such a device is United States Patent 2,545,779, issued to Harrison. It is also known in the prior art to provide a pencil sharpener in which the housing may be rotated if desired, as may be seen in United States Patent 2,123,511, issued to Lobel.

It has been found that the provision of a power means to rotate the housing contemporaneously with the pencil sharpening element is beset with a major difficulty. This difficulty resides in the assurance of a rotation speed sufficient to perform an efficient pencil sharpening operation and yet slow enough to produce the desired novelty effect. After considerable study in attempting to find an optimal rate of rotation for the point sharpening element and for the housing, it was found that the housing could be rotated at a slower speed than the point sharpening element to satisfy all the requirements of the device.

It is an object of the instant invention to provide a novelty pencil sharpener having a hollow rotatably mounted housing including a point sharpening element ranged to rotate the point sharpening element in the housing upon the insertion of a pencil into the point sharpening element.

Another object of the instant invention is to provide a novelty pencil sharpener in which a housing is rotated at a rate of speed less than the rate of rotation of a point sharpening element within the housing to form a pencil point and simultaneously rotate a housing upon which various indicia may be placed to provide the desired novelty effect.

Still another object of the instant invention is to provide a battery powered electric pencil sharpener in which the batteries are received in a stationary base and are in electrical communication with a motor mounted in the housing to rotate the housing and point sharpening element without the necessity of moving the relatively heavy batteries.

A further object of the instant invention is to provide a novelty pencil sharpener having a rotatable housing mounted on a stationary bracket to produce the rotary effect by rotating only the housing and components therein.

Other objects and advantages of the instant invention reside in the combinations of elements, arrangements of parts, and features of construction and operation, all as will be more fully pointed out hereinafter and disclosed in the accompanying drawings wherein there is shown a preferred embodiment of this inventive concept.

In the drawings:

FIGURE 1 is a side elevational view of the novelty pencil sharpener of the instant invention;

FIGURE 2 is a rear elevational view of the pencil sharpener of FIGURE 1;

FIGURE 3 is a horizontal cross-sectional view of the pencil sharpener of FIGURES 1 and 2 taken substantially along line 3—3 of FIGURE 1, illustrating a clip to which the housing is releasably secured;

FIGURE 4 is a bottom view of the pencil sharpener of FIGURES 1 and 2, illustrating in dashed lines the batteries sufficient to power the motor within the housing;

FIGURE 5 is an enlarged view of the pencil sharpener of the instant invention, certain parts being broken away to illustrate the operating components thereof:

FIGURE 6 is a cross-sectional view of the pencil sharpener of FIGURE 5 taken substantially along line 6—6 thereof as viewed in the direction indicated by the arrows, illustrating the geared drive train utilized to rotate the point sharpening element and the housing;

FIGURE 7 is another cross-sectional view of the working mechanisms of the pencil sharpener of FIGURE 5, taken substantially along line 7—7 thereof as viewed in the direction indicated by the arrows;

FIGURE 8 is an enlarged view of the central portion of the operating mechanism of FIGURE 5, illustrating the slip connection between the pencil sharpening element and the drive train which is sufficient to manipulate a movable electrical contact placed in the path of the sharpener movement; and

FIGURE 9 is a schematic view of the electrical circuit and contact closing mechanism of the instant invention.

General construction and operation

Referring now to the drawings in detail, wherein like reference characters designate like elements throughout the several views thereof, the pencil sharpener of the instant invention is indicated generally at **10** comprised of a base shown generally at **12** positioned on an underlying surface **14**, a support designated generally at **16** and a housing denominated generally at **18** arranged to rotate on support **16**. As will be pointed out more fully hereinafter, a pencil **20** is inserted through a sleeve **22** into engagement with a point sharpening element shown generally at **24** interiorly of housing **18**. The engagement of pencil **20** with point sharpening element **24** acts to energize the working mechanism of the instant invention to rotate point sharpening element **24** simultaneously with housing **18** to sharpen pencil **20** and produce the desired novelty effect.

The major operating mechanisms of the illustrated device are shown best in FIGURE 5 and comprise a mounting mechanism shown generally at **26** rotatably mounting housing **18** on support **16**, an electric motor shown generally at **28** inside housing **18**, a gear train illustrated generally at **30** drivably connecting motor **28** to point sharpening element **24** and a supplementary gear train designated generally at **32** drivably connecting gear train **30** and motor **28** to mounting means **26** for rotating housing **18**. A plurality of batteries **34** are interconnected by an electrical circuit shown generally at **36** in FIGURE 9 to motor **28** and a switch shown generally at **38** to energize a motor **28** upon the insertion of pencil **20** into point sharpening element **24**.

External construction

Base **12** includes a substantially planar bottom wall **40** carrying a plurality of depending feet **42** resting on surface **14**. A casing shown generally at **44** rests on bottom wall **40** and comprises a series of generally frusto-

conical sections 46, 48, 50 tapering upwardly and joined together by a pair of planar annular plates 52, 54. As may be seen best in FIGURE 5, casing 44 provides a hollow compartment receiving batteries 34 and the necessary electrical wires to connect batteries 34 in an operative relation. In order to replace batteries 34, bottom wall 40 includes a plurality of ears 41 which may pass through openings 43 in a reverted lip 45 formed by casing 44, as shown best in FIGURE 4. By grasping handle 47 and rotating bottom wall 40, ears 41 may be aligned and passed through openings 43 to remove bottom wall 40 in a convenient and expeditious manner.

As shown in FIGURE 5, support 16 includes a plug shown generally at 56 having a reduced diameter section 58 received in an opening 60 in the top of casing 44. A semi-circular band 62 is connected to plug 56 by a bolt 64 extending through plug 56. A washer 66 and a nut 68 are received on the end of bolt 64 to secure plug 56 and consequently band 62 to casing 44. As will be pointed out more fully hereinafter, the characteristics of plug 56 will be utilized to transmit electrical energy from batteries 34 to motor 28.

Housing 18 includes a pair of generally hemispherical sections 70, 72 which are preferably ornamented with a facsimile of the continents forming a globe replica to enhance the novelty effect produced by the rotation of housing 18. Each of sections 70, 72 is frictionally clipped onto a central web shown generally at 74 constituting the major structural unit interiorly of housing 18. Central web 74 includes a planar circular plate 76 having an upstanding resilient flange 78 for grasping hemispherical section 72 and a depending resilient flange 80 for attachment to hemispherical section 70. Providing access to the interior of housing 18 is a pair of guides 82, 84 forming a pair of aligned openings 86, 88. As may be seen in the upper left-hand portion of FIGURE 5, web 62 forms an opening in which sleeve 22 is affixed with sleeve 22 extending through opening 86 when pencil sharpener 10 is in the assembled condition.

Housing mounting mechanism

Mounting mechanism 26 includes a substantially circular plate 90, made of a dielectric material such as plastic or the like, secured to plate 76 by a plurality of dielectric legs 92 and frictional fasteners 94, illustrated as screws. A dielectric boss 96 extends downwardly from the center of plate 90 and forms a central blind passageway 98 rotatably receiving a metallic rod 100. Rod 100 receives a thin metal rod 102 which extends outwardly of housing 18 and receives a knob 104 on the end thereof.

A metallic washer 106 surrounds the terminus of rod 100 and is secured thereto by a press fit connection 108. Connection 108 is spaced from an elongate dielectric tube 110 surrounding rod 102 by a spacer 112. Surrounding tube 110 is a metallic sleeve shown generally at 114 having a circular cross section 116 throughout a substantial portion of its length and a square cross section 118 at the external terminus thereof. As shown best in FIGURE 5, the lower extremity of metallic band 62 forms a square slot 120 receiving the lower end of metallic sleeve 114 and holding it against rotation therein.

As will be explained more fully hereinafter, motor 28 will be energized through electrical circuit 36, one path of which includes a metal rod 102, metal rod 100 and washer 106. When motor 28 is actuated, gear tracks 30 and 32 will begin operation to rotate a spur gear 122 in meshing engagement with a stationary gear 124 affixed to metallic sleeve 114. Since gear 124 is held against rotation by the co-action of terminus 118 of sleeve 114 and slot 120 of band 62, spur gear 122 will track around the circumference of gear 124 to rotate housing 18.

Point sharpening element

Point sharpening element 24 may be of any suitable configuration but is illustrated as having a frame 126 providing a frustoconical apertured pencil receiving section 128 having a slot 130 juxtaposed to a sharpening blade 132 held on frame 126 by a suitable fastener 134 illustrated as a screw. A stub shaft shown generally at 136 is secured at one end to frame 126 by a threaded shank 138 and extends through an opening 140 in circular plate 76 for reciprocable movement. The other end 142 of shank 136 is slidably received in a sleeve 144 embedded in plate 90 coaxial with a second blind passageway 143 aligned with passageway 98. It is apparent, therefore, that shank 136 is free to reciprocate within certain specified limits.

Driving mechanism for point sharpening element

A U-shaped brace 146 is secured perpendicularly to plate 94 in any conventional manner and receives electric motor 28 between the legs thereof. A threaded shank 148 on motor 28 extends through the bottom wall of brace 146 with a nut 150 securing motor 28 in place. The drive shaft 152 of motor 28 extends through an opening in plate 90 and carries a spur gear 154 on the terminus thereof.

Gear 154 is in meshing engagement with a larger gear 156 affixed to a shaft 158 extending upwardly from plate 90. Shaft 158 is journaled in a bearing plate 160 spaced from plate 90 by a plurality of columns 162 and frictional fasteners 164 illustrated as screws. Shaft 158 fixedly carries a smaller gear 166 in meshing engagement with a larger gear 168 mounted on a shaft 170 journaled between bearing plate 160 and circular plate 90. Shaft 170 carries a smaller gear 172 in meshing engagement with a larger gear 174 affixed to shank 136.

It will be seen that the activation of electric motor 28 will rotate drive shaft 152 and gear 154 which will in turn drive gears 156, 166, 168, 172, and 174 to rotate shank 136 and consequently point sharpening element 24. Although the rotation of drive shaft 152 is geared down considerably, the rotation of point sharpening element 24 is sufficiently fast to form a point on pencil 20 in an efficient and expeditious manner.

Driving means for housing

The gear train for drivably rotating housing 18 begins with a small spur gear 176 mounted on shank 136 and in meshing engagement with a larger gear 178 mounted on a shaft 180 journaled between bearing plate 160 and circular plate 90. Shaft 180 extends through plate 90 and carries a small spur 182 on the lower end thereof in engagement with spur gear 122. The lower end of shaft 180 is journaled in a U-shaped bracket 184 perpendicularly affixed to circular plate 90 as best seen in FIGURES 5 and 7. Spur 122 is mounted on a shaft 186 which is journaled between the bottom wall of bracket 184 and circular plate 90.

It will be seen, therefore, that the activation of motor 28 results in the rotation of shank 136, point sharpening element 24 and spur gear 176. The rotation of gear 176 sets gear train 32 in motion to rotate spur gear 122 about the circumference of stationary gear 124. Since plates 90, 76 are affixed to spur gear 122 for rotation about the axis of pencil 20, metallic rod 100 and rod 102, it will be seen that housing 18 will be rotated contemporaneously with the rotation of point sharpening element 24. Since the rotary movement of point sharpening element 24 is further geared down through gear train 32, it is apparent that the rotation of housing 18 will be slower than the rotation of point sharpening element 24.

Electrical circuit

Although various components of electrical circuit 36 have been mentioned in the previous discussion of the instant invention, it is believed necessary to discuss these elements more fully. Referring now to FIGURE 9, an electrical path shown generally at 188 provides communication between batteries 34 and one side of motor 28.

Electrical path **188** includes three pairs of battery receiving brackets **190** mounted within casing **44** (FIGURES 4 and 5) connected in series by a pair of electrical leads **192**. An outlet wire **194** connects one end of the battery series to a metallic washer **196** sandwiched between dielectric casing **44** and dielectric plug **56** as shown in FIGURE 5. Washer **196** is jointed with a bifurcated metal bracket shown generally at **198** having a pair of outwardly diverting ends **200** providing communication to a pair of half sleeves **202** positioned to receive metal rod **102**. As previously mentioned, metallic rod **102** is in communication with rod **100** and washer **106** which is connected by a lead wire **204** to one side of electric motor **28**.

The other side of bateries **34** is connected by an electrical path shown generally at **206** to mounting means **26**. As shown in FIGURE 5, an outlet wire **208** connects the other side of the battery series to a metallic washer **210** surrounding bolt **64**. As previously discussed, bolt **64** extends through dielectric plug **56** and is in electrical communication with metallic band **62**. Since band **62** forms slot **120** receiving metallic sleeve **114**, it will be apparent that electrical path **206** connects batteries **34** with mounting means **26**.

As shown in FIGURE 9, an electrical path **212** provides communication between mounting means **26** and gear **176** of shank **136**. Referring to FIGURE 5, stationary gear **124** is made of an electrically conducted material and acts to pass electrical current from metallic sleeve **114** to spur gear **122**. Since spur **122** is in meshing engagement with spur **182**, and electrical path will be completed including spur gear **182**, shaft **180**, gear **178** and gear **176**. A partial alternative electric path is provided between sleeve **114** and shank **136** by bracket **184**, shaft **180**, and bearing plate **160**. In any event, it will be evident that shank **136** will be electrically connected to one side of batteries **34** through mounting means **26**.

Referring now to FIGURES 8 and 9, switch **38** includes a spring arm **214** affixed to dielectric wall **90** by a frictional fastener **216**, illustrated as a rivet. The free end of arm **214** extends under gear **174** and is depressed by the downward movement of stub axle **136** when pencil **20** is insertd into point sharpening element **24**. Spring arm **214** carries a shorter arm **218** disposed immediately above an electrical contact **220** extending through dielectric wall **90**. An electric lead **222** connects contact **220** with the other side of electric motor **28**.

Summary of operation

The insertion of pencil **20** into point sharpening element **24** will depress stub axle **136** to force short arm **218** into engagement with contact **220** thereby completing electrical circuit **36**. Electrical energy will therefore be delivered to motor **28** acting to set gear trains **30**, **32** in motion. As previously mentioned, gear train **30** drivably rotates pencil sharpening element **24** at a high rate of speed while gear train **32** drivably rotates housing **18** at a lower rate of speed. The shavings produced by cutting blade **32** will exit through slot **30** and collect on circular plate **76**. When the sharpening operation is completed and pencil **20** has been removed, spring arm **214** will press against gear **174** to raise stub axle **136** and disengage short arm **218** from contact **220**, thereby severing electrical circuit **36** and the motor **28**.

When it is desired to remove the shavings from inside housing **18**, housing **18** may be removed from support **16** by pulling outwardly on knob **104** to release rod **102** from between half sleeves **202**. A downward and outward pulling motion will clear sleeve **22** from opening **86** to free housing **18**. Upper hemispherical section **72** may then be removed and the shavings discharged into a convenient receptacle.

It should be pointed out that the provision of batteries **34** in base **12** is of particular importance since these heavy objects do not need to be rotated by motor **28** thus lessening the current required.

It is now seen that there is herein provided an improved pencil sharpener having all of the objects and advantages of the instant invention and others, including many advantages of great practical utility and commercial importance.

Since many embodiments may be made of the instant inventive concept, and since many modifications may be made of the embodiment hereinbefore shown and described, it should be understood that the foregoing is to be interpreted merely as illustrative and not in a limiting sense.

I claim:

1. A pencil sharpener comprising:
a stationary base adapted to be supported by an adjacent surface;
a hollow housing having a pencil receiving opening;
means rotatably mounting the housing on the base;
a point sharpener, rotatably mounted in the housing, in alignment with the pencil receiving opening for receiving and sharpening the end of a pencil inserted into the housing;
means, carried by the pencil sharpener, for simultaneously rotating the point sharpener at a first rate of rotation and rotating the housing at a second rate of rotation less than the first rate of rotation,
said mounting means including
a band, on the base, surrounding at least half of the housing having a journal aligned with and engaging the pencil receiving opening and a rotation preventing means, approximately 180° from the journal for receiving a nonrotating support;
a nonrotating support, held in the rotation preventing means, extending into the housing; and
means connecting the housing and the nonrotating support for relative rotational movement; and
wherein
the rotating means includes
means drivably rotating the housing about the nonrotatable support.

2. The pencil sharpener of claim 1 wherein the housing rotating means includes
an electric motor in the housing;
a stationary gear on the nonrotatable support in the housing; and
a gear train operatively connecting the electric motor to the stationary gear including a gear, journaled for rotation about its own axis, and mounted with the housing for revolving about the nonrotating support, in meshing engagement with the stationary gear for movement about the periphery thereof upon actuation of the electric motor to rotate the housing with respect to the nonrotating support.

3. The pencil sharpener of claim 2 further including
an electric circuit for selectively energizing the electric motor including
at least one battery in the base providing the electric energy for actuating the electric motor;
a first electric path, including portions of the mounting means connecting one side of the battery to the motor;
a second electric path, including portions of the mounting means connecting the other side of the battery to the motor; and
a normally open switch, in one of the electric paths, for selectively driving the motor upon closing of the switch.

4. The pencil sharpener of claim 3 wherein
the base is made of a dielectric material;
the nonrotating support is made of a first conducting means, a second conducting means, and insulating means electrically separating the first and second conducting means; and

the first electric path includes

a first conductive strip through the base from the battery to a predetermined point;

a clip, contacting the first conductive strip, extending away from the base for selective engagement with the first conducting means of the nonrotating support;

the first conducting means of the support; and

a wire connecting the first conducting means of the support to the motor.

5. The pencil sharpener of claim 4 wherein

the band is made of an electrically conductive material;

the second electric path includes

a second conductive strip through the base from the battery to the band;

the second conductive means of the support; and

means, in the housing, connecting the second conductive means of the support to the motor.

6. The pencil sharpener of claim 5 wherein the housing is spherical forming a replica of a globe and the mounting means provides an inclined angle of rotation for the spherical housing.

7. A pencil sharpener comprising:

a stationary base adapted to be supported by an adjacent surface;

a hollow housing having a pencil receiving opening;

means rotatably mounting the housing on the base including

a band, on the base, surrounding at least half of the housing having a journal aligned with and engaging the pencil receiving opening and a rotation preventing means, approximately 180° from the journal for receiving a nonrotating support;

a nonrotating support, held in the rotation preventing means, extending into the housing; and

means connecting the housing and the nonrotating support for relative rotational movement;

a point sharpener, rotatably mounted in the housing, in alignment with the pencil receiving opening for receiving and sharpening the end of a pencil inserted into the housing; and

means, carried by the pencil sharpener, for drivably rotating the housing about the nonrotatable support and simultaneously rotating the point sharpener.

8. The pencil sharpener of claim 7 wherein the housing includes two substantially hemispherical parts and a central web releasably securing the hemispherical parts together and dividing the housing into an upper shavings receiving compartment and a lower motor compartment, the point sharpener being above the web in the shavings compartment.

9. The pencil sharpener of claim 8 wherein the rotatable mounting means includes means mounting the housing at an angle inclined to the vertical and wherein the journal, pencil receiving opening, nonrotatable support, and rotation preventing means are arranged for releasably holding the housing on the band.

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