Nov. 18, 1952 C. F. HAASE 2,618,240

LEAD SHARPENER FOR DRAFTSMEN'S PENCILS

Filed May 23, 1951 2 SHEETS—SHEET 1

Fig. 2.

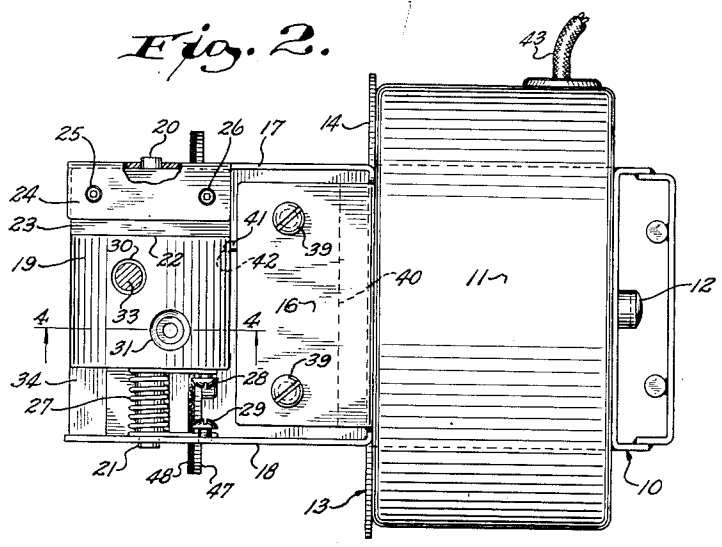
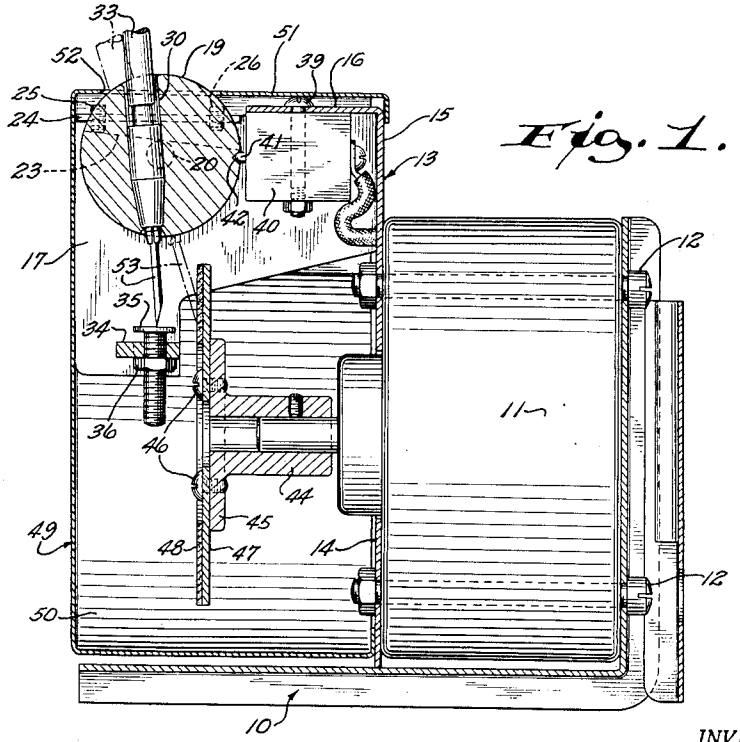


Fig. 1.



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Fig. 3.

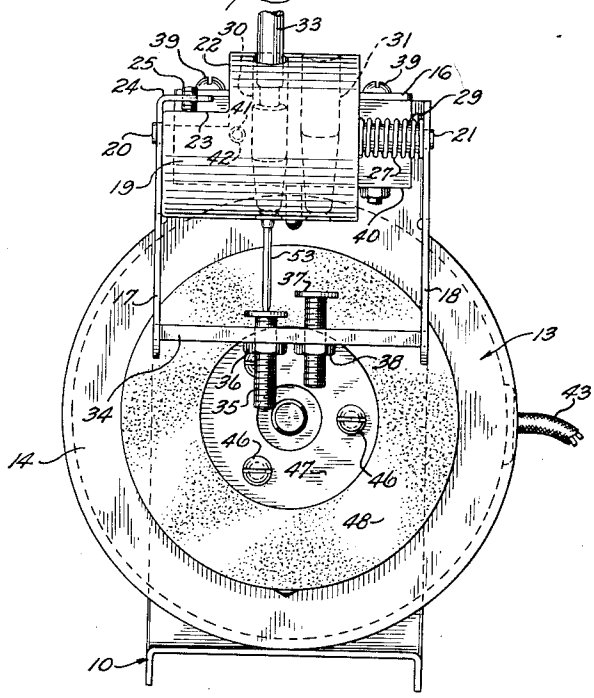


Fig. 4.

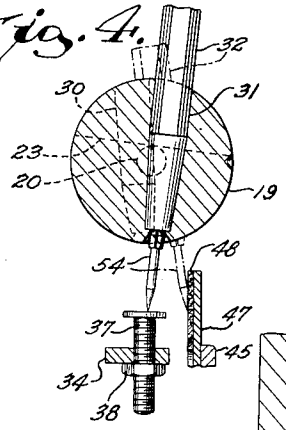


Fig. 6.

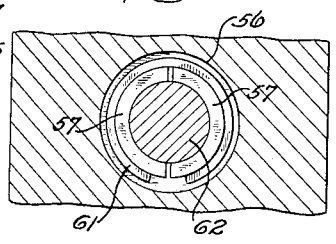
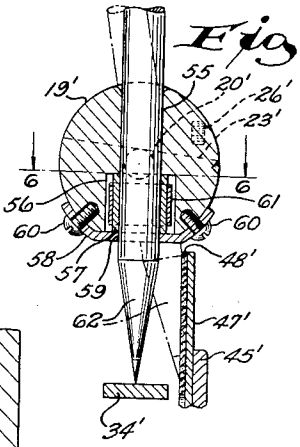


Fig. 5.



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UNITED STATES PATENT OFFICE

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LEAD SHARPENER FOR DRAFTSMEN'S PENCILS

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2 Claims. (Cl. 120—96)

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This invention relates to improvements in lead sharpeners for draftsmen's pencils.

Draftsmen's pencils are of two types, namely, mechanical pencils, and ordinary wooden pencils. The lead of a draftsman's pencil must be frequently sharpened, and the method ordinarily used is to draw the point of the pencil lead across the face of a file or a similar abrasive surface. For various applications, different types of points are desired by draftsmen. For example, a sharp conical point may be needed for drawing fine lines, whereas a blunter point is more desirable for lettering work. For compass leads, a single bevel point of predetermined length is required, while other drawing work may require a double beveled pencil point.

It is, of course, desirable to produce the required point with a minimum of grinding away of lead, so that the life of the lead is prolonged as much as possible. The sharpeners heretofore available have not been entirely satisfactory for a number of reasons. Many of the prior sharpeners continue to grind away lead as long as the pencil is held therein after the point is formed. Further, the conventional sharpeners do not form a point of predetermined length, nor can they be used to selectively form conical, or single, or double beveled points.

With the above in mind, it is a general object of the present invention to provide a lead sharpener which can form a selected type of point on a pencil with a minimum of grinding away of lead.

A further object of the invention is to provide an improved sharpener of the class described which can form a point of predetermined length on the pencil being sharpened, this feature making the improved sharpener well adapted for use in the sharpening of leads of certain types of compasses as well as of pencils.

A further more specific object of the invention is to provide an improved sharpener of the class described which can selectively form on a lead a conical or single or double bevel point of a selected degree of sharpness.

A further specific object of the invention is to provide an improved sharpener of the class described having an adjustable lead stop member for gauging the length of the lead point prior to the sharpening operation, the construction of the sharpener being such that the length of the lead after sharpening is substantially the same as the length of the gauged lead prior to sharpening.

A further object of the invention is to provide an improved sharpener of the class described having a movable pencil holder and having an

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electric motor driven rotary abrasive element, there being a switch in the electrical circuit for the motor, said switch being positioned for actuation by the pencil holder to start said motor upon movement of the holder to lead sharpening position.

A further specific object of the invention is to provide a pencil holder formed with a pair of pencil holding bores which are angularly offset from each other so that a pencil placed in one of said holes can be formed with a conical or double beveled chisel type point, and a pencil placed in the other of said bores can be formed with a single beveled point of the type used on compass leads.

A further object of the invention is to provide an improved sharpener of the class described wherein the pencil holder is provided with an axially rotatable collar which is adapted to frictionally receive an ordinary wooden pencil coaxially therewith, said collar being held against axial movement by said holder whereby a pencil held therein is free to rotate axially, but any axial movement thereof is resisted by frictional contact with the collar.

With the above and other objects in view, the invention consists of the improved lead sharpener and all of its parts and combinations, as set forth in the claims, and all equivalents thereof.

In the drawings accompanying and forming part of this specification, wherein is shown one complete embodiment of the preferred form of the invention, and wherein like characters of reference indicate the same parts in all of the views:

Fig. 1 is a side elevational view of the improved sharpener with parts being broken away and showing a compass pencil arm positioned in one of the bores of the pencil holder;

Fig. 2 is a plan view of the improved sharpener with the cover removed;

Fig. 3 is a front elevational view of the improved sharpener with the cover removed;

Fig. 4 is a vertical sectional view taken approximately along the line 4—4 of Fig. 2 and showing a pencil positioned in the holder bore through which the view is taken;

Fig. 5 is a view similar to Fig. 4 showing a modified form of pencil holder; and

Fig. 6 is an enlarged sectional plan view taken approximately along the line 6—6 of Fig. 5.

Referring more particularly to Fig. 1, the numeral 10 indicates an L-shaped channeled frame, and the numeral 11 indicates an electric motor, the rear end of which is connected, as by screws 12, to the upstanding arm of the frame 10, as

shown. A secondary frame 13, which may be formed of a sheet metal stamping, has a centrally apertured circular plate portion 14 which is attached by the screws 12 to the front end face of the motor 11. The plate 14 has an upwardly projecting rectangular extension 15 which terminates in a horizontally forwardly extending flange 16. Projecting forwardly and downwardly from the side edges of the extension 15 are a pair of spaced parallel generally L-shaped vertical plates 17 and 18.

A preferably cylindrical pencil holder 19 is formed at one end with a relatively short axially extending shaft 20, and is formed at its other end with a longer axially extending shaft 21. The pencil holder 19 is positioned between the plates 17 and 18, and the shafts 20 and 21 are journaled in suitable bearings in said plates. The holder 19 is cut away, as at 22, to form a flat face or shoulder 23. Formed on the upper edge of the plate 17 is a rectangular horizontal flange 24 which extends horizontally inwardly and over the shoulder 23 of the holder 19. Stop screws 25 and 26 are threaded through the flange 24 adjacent the opposite ends thereof and are adapted to be engaged by the shoulder 23 to limit the rotative movement of the pencil holder 19.

A helical torsion spring 27 extends around the shaft 21 between the adjacent end of the holder 19 and the plate 18, said spring having one end in engagement with a screw 28 carried by the adjacent end of the holder 19, the other end of the spring engaging a screw 29 carried by the plate 18. The spring 27 urges the holder 19 in a clockwise direction as viewed in Fig. 1, to thereby urge the shoulder 23 into engagement with the stop screw 25.

The holder 19 is formed with a pair of tapered pencil holding bores 30 and 31 extending transversely therethrough. The bore 30 preferably extends at the angle shown in Fig. 1, and is adapted to receive the end of a mechanical pencil arm 33 of a compass or the pointed end of a mechanical type drawing pencil. The restriction at the lower end of the bore 30 provides a seat which limits the downward travel of the pencil therein. The bore 31 preferably extends at an acute angle from the bore 30, as shown in Fig. 4. The bore 31 is adapted to receive and seat the pointed end of a mechanical type drawing pencil such as the pencil 32. Extending transversely between the depending ends of the plates 17 and 18 is a horizontal bar 34. Positioned below and in alignment with the bore 30 is a vertically adjustable stop screw 35 which is threaded through the bar 34 and which may be provided with a lock nut 36. Positioned below and in alignment with the bore 31 is a similar stop screw 37 which is threaded through the bar 34 and it may be provided with a lock nut 38.

Connected to the underside of the flange 16, as by screws 39, is a normally open push button type electrical switch 40 from which projects a depressible pin 41. The pencil holder 19 is formed in its periphery with a depression 42 which is preferably conical in shape and which is positioned to receive the rounded tip of the pin 41 when the holder is in the normal position shown in Figs. 1 to 3. The switch 40 is connected in series with the power line 43 of the electric motor 11, and rotation of the holder 19 depresses the pin 41 to close the contacts of said switch.

Removably fixed to the shaft of the motor 11 is a sleeve 44 which is formed at one end with a radially outwardly projecting annular flange 45.

Removably coaxially fixed to the flange 45, as by screws 46, is a disk 47 having an annular abrasive surface 48. A removable cover 49 has a cylindrical portion 50 of approximately the same diameter as the plate 13 and has an upwardly extending rectangular portion 51. The upper wall of the cover 49 is formed with an aperture 52 through which projects the upper peripheral surface of the holder 19 to expose the upper ends of the bores 30 and 31.

When it is desired to put a single beveled point on a compass pencil lead such as that in the pencil arm 33 of Fig. 1, the arm is inserted in the bore 30, as shown. The arm 33 is then pressed downwardly so that the lead holding mechanism releases the lead 53 and permits said lead to drop by gravity into contact with the stop screw 35. Upon releasing the downward pressure on the arm 33 the lead gripping mechanism tightens about the lead 53 as before. If the lead holding mechanism is of the screw propelling type, the lead is advanced into contact with the stop screw 35 while the arm 33 is seated in the bore 30. The stop screw 35 accurately gauges the length of the lead 53 which projects from the arm 33, and said stop screw is adjustably positioned so that the length of lead 53 gauged thereby is the exact length required by the compass to match the pencil point with that of the needle on the other arm of the compass.

With the pencil arm 33 positioned in the bore 30, the upper end of said arm is drawn to the left, as viewed in Fig. 1, to rotate the pencil holder 19 in a counterclockwise direction until the shoulder 23 abuts the stop screw 26. This rotation rotates the depression 42 away from the pin 41 of the switch 40 and depresses said pin to close the contacts of said switch. This causes the motor to rotate the disk 47. The described rotation of the pencil holder 19 also swings the lead 53 to the dot and dash line position of Fig. 1, and it will be noted that when the lead is so positioned the abrasive surface 48 forms a single bevel compass type point on the lead without shortening the gauged length of the lead.

The stop screw 26 is set so that the lead 53 cannot be swung beyond the dot and dash line position of Fig. 1, and therefore said lead cannot be ground away any more than that which is necessary to produce the desired bevel on the gauged length of lead. Upon releasing the compass arm 33, the spring 27 returns the holder 19 to its normal position, and the pin 41 again enters the depression 42 to open the contacts of the switch 40 and stop the motor 11. The compass arm 33, with its single beveled point of accurately gauged length is then ready for use.

In order to form a conical point on a mechanical pencil lead such as that of the pencil 32 of Fig. 4, the tip of the pencil is placed in the bore 31. The lead 54 is then released or advanced into contact with the stop screw 37, and the upper end of the pencil is drawn to the left to rotate the holder 19 in a counterclockwise direction and bring the shoulder 23 into contact with the stop screw 26. The stop screw 37 accurately gauges the length of the lead 54, and, as previously described, rotation of the holder 19 away from its normal position actuates the switch 40 and causes the motor to rotate the disk 47. The described rotation of the holder 19 swings the lead 54 to the dot and dash line position of Fig. 4, and it will be noted that in this position the lead 54 is at a substantially smaller angle to the surface

48 than the lead 53 in the dot and dash line position of Fig. 1. While the lead 54 is in contact with the abrasive surface 48, the pencil 32 may be axially rotated in the bore 30 to form a conical point on the tip of the lead 54.

When a double beveled chisel type point is desired on the lead 54, the pencil 32, instead of being axially rotated while in contact with the abrasive surface 48, is held against axial rotation. After a bevelled surface is formed on the lead, the holder 19 is returned to the normal position shown in Fig. 4. While the lead 54 is out of contact with the abrasive 48, the pencil 32 is rotated 180 degrees, and the lead 54 is again brought into contact with the abrasive surface 48 to form the second bevel surface on the lead. If a somewhat blunter point is desired, the stop screw 26 may be advanced downwardly so that the lead 54 engages the surface 48 at a smaller angle. Thus, a frusto-conical point can be formed on a pencil instead of a truly conical point.

Fig. 5 shows a modified form of pencil holder 19' which is similar in all respects to the holder 19 except that it is adapted to receive a conventional wooden pencil 62. The holder 19' is formed with a diametrically extending bore portion 55 having a diameter approximately equal to the diameter of a pencil 62. The bore 55 is formed at its lower end with a portion of enlarged diameter 56, and positioned in the portion 56 is a coaxial split collar 57 which is freely rotatable axially. The collar 57 is held in the portion 56 by a retaining plate 58 which is formed with an aperture 59 having a diameter approximately equal to that of the pencil 62. The retaining plate 58 is attached to the holder 19' by screws 60. A C-shaped spring 61 surrounds the split collar 57 to cause the latter to snugly frictionally engage the pencil 62 when the latter is inserted through the bore 55, collar 57 and aperture 59. The frictional engagement of the collar 57 with the pencil 62 resists axial movement of the pencil, but since the collar 57 is free to rotate in the bore portion 56, axial rotation of the pencil 62 is permitted.

In operation, the pencil 62 is pushed downwardly through the holder 19' as shown, and into contact with the lead stop 34'. The upper end of the pencil 62 is then drawn to the left in the same manner as the pencil 32 of Fig. 4, to move the tip of the pencil into contact with the rotating abrasive 48' and to move the shoulder 23' into contact with the stop screw 26'. The pencil 62 is then axially rotated while in contact with the abrasive surface 48' to form a conical point on said pencil by grinding away both the wood and the lead thereof. As was true with the preferred form of the invention the desired point is formed on the pencil without shortening the lead thereof. Only enough of the pencil is ground away to form the desired point.

While it is preferred to use a motor driven abrasive disk, the improved sharpener has utility whether or not the abrasive member is movably mounted.

Various other changes and modifications may be made without departing from the spirit of the invention, and all of such changes are contemplated as may come within the scope of the claims.

What I claim as the invention is:

1. In a pencil sharpener: an electrically driven movable abrasive member having a power circuit; a movably mounted pencil holder adjacent said abrasive member, said holder being adapted to hold a pencil to be sharpened and said holder being movable between a normal position wherein a pencil held thereby is spaced from the abrasive member and a sharpening position wherein the pencil is in abrading contact with the abrasive member; spring means normally holding said holder in said normal position; a stop member mounted adjacent said holder and positioned for engagement by the pointed end of a pencil in said holder when the holder is in normal position; and an electrical switch in the power circuit positioned for actuation by said holder upon movement of the latter to sharpening position.

2. In a pencil sharpener: an electrically driven movable abrasive member having a power circuit; a pivotally mounted pencil holder adjacent said abrasive member, said holder being adapted to hold a pencil to be sharpened and said holder being movable on its pivot axis between a normal position wherein a pencil held thereby is spaced from the abrasive member and a sharpening position wherein the pencil is in abrading contact with the abrasive member; spring means normally holding said holder in said normal position; a stop member mounted adjacent said holder and positioned for engagement by the pointed end of a pencil in said holder when the holder is in normal position; abutment means on said pencil holder; and an electrical switch in the power circuit positioned for engagement by said holder abutment means upon movement of the holder to sharpening position.

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