

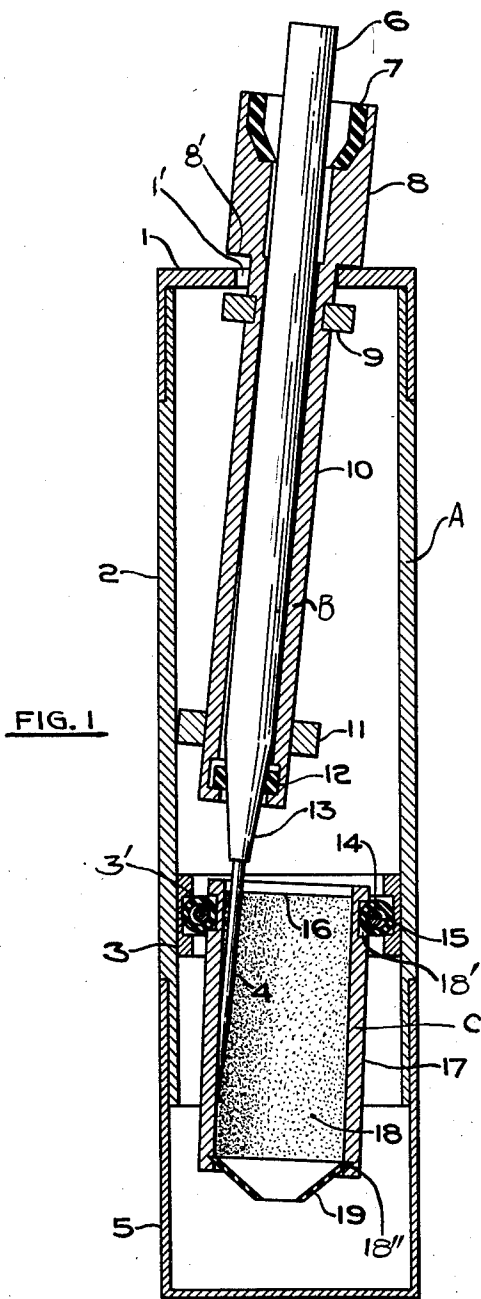
Oct. 14, 1952

D. W. VON KAMENICZKY
PENCIL POINT SHARPENER

2,613,645

Filed Dec. 4, 1950

3 Sheets-Sheet 1



INVENTOR.
Daniel Wellman von Kamenitzky

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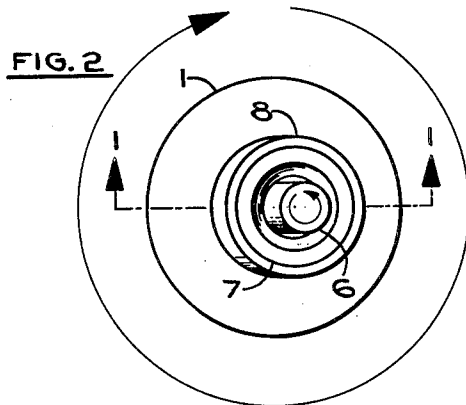
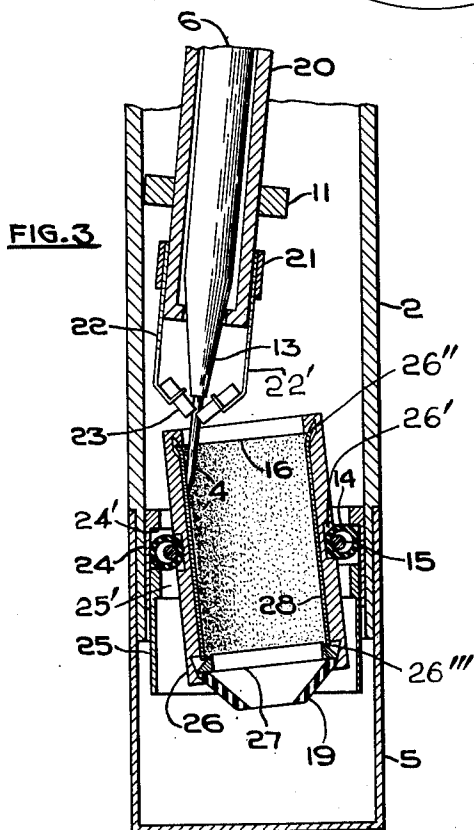
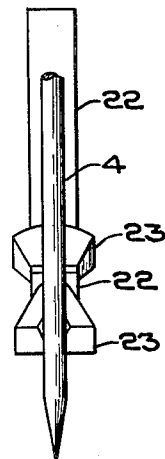
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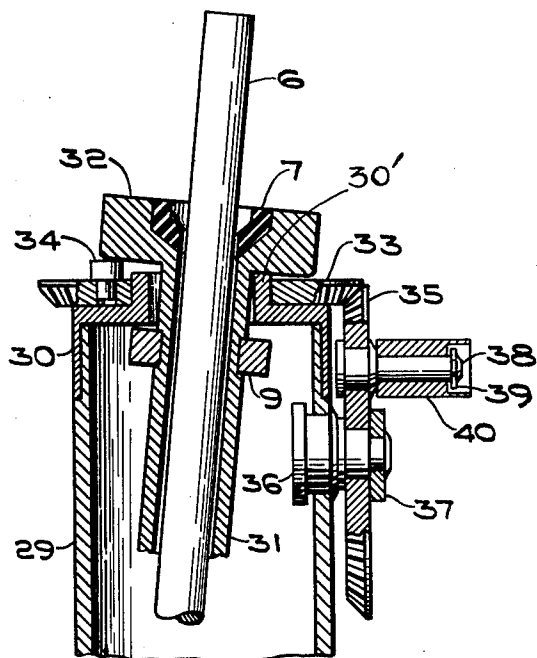


FIG. 5

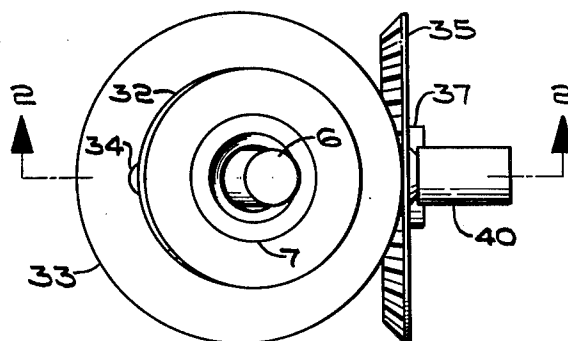


FIG. 6

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PENCIL POINT SHARPENER

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3 Claims. (Cl. 120—91)

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This invention relates to a pencil sharpener and has for its object to provide an improved means for sharpening the leads of pencils.

It is another object of the invention to provide a pencil lead sharpener wherein the lead of the pencil will be sharpened to a perfectly concentric conical point automatically and to eliminate the need for a careful, continuous, even and steady pressure when sharpening where skill is a factor to get a truly concentric conical point.

It is another object of the invention to provide a pencil lead sharpener wherein the abrasive tube is universally tiltable so that it will yield to the pressure of the lead before the breaking point of the lead is reached and whereby a long lead, such as used by photo-retouchers, can be sharpened.

It is still another object of the invention to provide a pencil lead sharpener wherein the abrasive tube is made so that the abrasive cloth can be easily inserted into the abrasive tube and retained without gluing and wherein the cloth can be easily and quickly replaced.

It is still another object of the invention to provide a pencil lead sharpener wherein the lower end of the socket means is provided with means to wipe the lead free from the graphite dust automatically when withdrawing the pencil from the socket.

For a better understanding of the invention, reference may be had to the following detailed description taken in connection with the accompanying drawing, in which:

Fig. 1 is a vertical sectional view taken on line 1—1 of Fig. 2;

Fig. 2 is a top planned view of a form of the invention shown in Fig. 1;

Fig. 3 is a sectional view similar to Fig. 1 of a modified form of the invention;

Fig. 4 is an enlarged side elevational view of the lead wiping parts;

Fig. 5 is a fragmentary sectional view taken on line 2—2 of Fig. 6 and of a still further form of the invention;

Fig. 6 is a top planned view of the form of the invention shown in Fig. 5.

All parts are circular and concentric generally throughout the construction of the sharpener. The parts which are tiltable are co-axial when in their inoperative position with one another and are co-axial with the fixed and non-tiltable parts.

In Fig. 1, there is shown a cylindrical tube support 2, a cylindrical cap 1 secured on the

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upper end portion of support 2 and having a central circular aperture 1' on its top. Support 2 and cap 1 form support unit A. Socket 10 is projected through said aperture 1' and is tiltable within the support 2. The upper end portion of socket 10 is formed in the shape of a bulging cylindrical head 8 and is supported on the cap 1 by a shoulder 8'. The socket 10 is universally tiltable on the seat formed by said aperture on top of said cap 1. The diameter of the aperture 1' in the cap 1 is much larger than the external diameter of the socket 10. The socket 10 is centrally bored to receive pencil 6 and the lower end thereof has an inner circular groove, in which is disposed a freely rotatable resilient pencil grip ring 12 made of rubber. The bore of socket 10 is larger in diameter than the diameter of pencil 6 and the inside diameter of grip ring 12 is smaller in diameter than the untapered portion of the pencil 6. Inside the upper portion of the head 8 there is a soft rubber grommet 7 for protecting the lead 4 when inserting or withdrawing the pencil 6 into or out of the socket 10. Adjacent the aperture of cap 1 is a fixed split retaining ring 9 to prevent the withdrawing of socket 10 from cap 1. Outside the lower end portion of socket 10 there is a collar 11 frictionally and axially movably secured thereto.

Grommet 7, head 8, ring 9, socket 10, collar 11 and grip ring 12 constitute a tiltable socket unit B which is universally tiltable relative to the support unit. The support unit (1, 2) is preferably made of aluminum and the socket unit (7, 8, 9, 10, 11) may be made of aluminum or plastic material with the exception of the soft rubber grommet 7 and grip ring 12 which are made of rubber material. Tube 17 is of cylindrical shape and is made of metal or plastic material. Adjacent its upper end is an external annular groove 18'. The inner wall of the tube 17 is abraded at 18 with the exception of a narrow strip 16 at its upper end. The strip 16 is smooth and is of the same diameter as the abraded surface 18 of the tube 17. The strip 16 will limit the grinding action so that the lead will not be eaten up. At the lower end of the tube 17 is small annular groove 18'' in which is fixed a frustoconical funnel 13 made in this instance of a flexible rubber material and through which pencil filings are dispensed. In the upper groove 18' of tube 17 is a resilient rubber tube formed into the shape of a ring 14 by a resilient split metal ring 15 which is disposed within the rubber tube ring 14. The outer periphery of tube ring 14 lies in an annular groove

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3' of a split resilient metal ring 3. Ring 3, tube ring 14, ring 15, strip 16, tube 17, abrasive surface 18 and funnel 19 constitute abrasive unit C. The abrasive unit C is supported in the support unit A by means of ring 3 which is axially adjustable on the inner wall of support 2. The ring 3 is frictionally retained in its adjusted position and becomes practically an integral part of support 2. With the exception of ring 3 the other parts of the abrasive unit C are universally tiltable relative to the support unit A and ring 3. Cup 5 is removably secured to the lower end portion of support 2 and serves to collect the graphite abraded from the pencil lead. The pencil lead sharpener is assembled as shown in Fig. 1. This pencil lead sharpener is for sharpening the long leads of refillable pencils of the type used by draftsmen and photo-retouchers. Fig. 1 shows a pencil lead sharpener especially for the use of photo-retouchers. Photo-retouchers use a long protruding lead from the tip of the pencil, about two inches long, and they sharpen the tip of the lead to a fine conical needle point.

To sharpen the lead of these pencils, Fig. 1, pencil body 6 is projected into the socket 10 and is slightly pushed downward into the rubber ring 12. The rubber ring 12 will grip tapered tip 13 of the pencil body 6. The inner diameter of the socket is greater than the diameter of the pencil body so that the pencil with ring 12 can freely rotate therein. The socket 10 is taken hold of at the upper end by its head 8 with the fingers and thumb of a hand without touching the pencil 6, and thus a tilted circular movement is imparted to the socket 10 in respect to the support unit so that the lead 4 of the pencil 6 tilts the abrasive tube 17 by pressing against the abrasive surface 18.

The maximum tilting of the tube 17 occurs when the collar 11 of the socket 10 abuts the inner wall of support 2 as shown in Fig. 1. This maximum tilting of the tube 17 requires less force than is required to fracture the lead 4 of the pencil 6. The force required to tilt the tube 17 depends on how much the rubber ring 14 is compressed between the grooves of ring 3 and tube 17, and also of the position of the collar 11 which is axially tightly adjustable on the socket 10 for selecting the proper angular degree of a maximum tiltability for both the socket 10 and the tube 17 and thus predetermine the force available to tilt the tube 17. Accordingly, there is little chance of the lead becoming broken due to any excessive side thrust. The circular movement of the socket 10 is self-guiding and because of the centrifugal action, the pencil moves outwardly so that the lead 4 touches the abrasive 18. Since the pencil is free in the socket, it can rotate. Accordingly while sharpening the lead 4 of the pencil 6 in this manner, the pencil 6 is rotated around its own axis automatically about once for every five or more complete circular movements of the socket 10 without skill and an absolutely concentric lead point is obtained. The bearing of the lower end of the pencil through ring 12 with the lower end of the socket and the upper portion of the pencil body with the upper portion of socket base causes the rotation of the pencil with the socket. Since the pencil rotates around its own axis, the socket 10 does not have to be absolutely co-axial with the abrasive tube 17 to give a concentric point which means that expensive accuracy in fabricating this pencil sharpener is not essential. When the pencil 6 rotates around its own axis it carries with

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it in rotation the rubber ring 12, but this ring 12 is not necessary to make the sharpener work. The ring 12 may be an integral part of the socket 10 and of hard material so that it will not grip the pencil 6, whereby pencil 6 will rotate as it does with the loose rubber ring 12.

The automatic movement of the pencil 6 around its own axis is not due to the roughness of the abraded surface 18 of tube 17. This surface may be smooth yet the pencil 6 or a straight rod will be automatically rotated in the same manner.

In Fig. 1, the pencil 6 may be dropped into the socket 10 because the bore of the socket 10 and the bore of grommet 7 are larger in diameter than pencil body 6. The rubber ring 12 will cushion the gravity impact of the pencil 6. The rubber ring 12 may either grip or not grip the pencil body 6. If it does grip, the pencil body 6 will be secured within the socket 10 against axial displacement with respect to the socket 10 but easily removable therefrom.

The lead 4 is long, the longer the lead 4 protrudes from the tip end 13 of the pencil body 6, the more easily it breaks, however, this fact is compensated by requiring less force to tilt the abrasive tube 17 and the socket 10, due to the mechanical advantage of working on the long arm of the levers.

In Fig. 3, there is shown a modified form of the invention wherein the lower half of my pencil point sharpener is differently constructed from that shown in Fig. 1. The view is taken in vertical section. The upper part of socket 20 is the same as socket 10 in Fig. 1. The bore of socket 20 is larger in diameter than the diameter of the pencil body 6, except that the lower end of said bore is smaller in diameter than the diameter of the pencil body 6 and is thus adapted for receiving the tapered end of the pencil body. At the lower end of socket 20, there is attached and held securely by sleeve 21, oppositely positioned resilient metal strip wiping arms 22 and 22' which extend downwardly beyond the lower end of socket 20. The lower ends of the arms 22 and 22' are bent inwardly and upwardly. The upwardly bent portions are apertured respectively to hold wiping fingers 23 made of resilient soft material. The lower end of the wiping fingers 23 yieldingly touch the lead 4 of pencil 6 as the pencil is lifted from the socket. Cylindrical tube 26 has an external annular groove 26' lying a considerable distance down from the upper end of the tube as compared with groove 18' of tube 17 in Fig. 1. Tube 26 has an internal, upwardly and outwardly slanted groove 26'' at its upper end and on the lower end it has an upwardly and outwardly slanted wide groove 26'''. An abrasive cloth 28 is secured removably to the inner wall of tube 26 with the upper end of said abrasive cloth 28 wedged into the upper groove 26''. A split resilient metal ring 27 of substantially triangular section is removably fitted in the lower groove to retain the lower end of the abrasive cloth upon the inner surface of the tube 26 and the upper periphery of funnel 19 in the bottom of groove 26'''. The abrasive cloth 28 is usually cut in the shape of a parallelogram and formed into a cylindrical tube and snugly fitted on the inner wall of tube 26.

A resilient split metal ring 24 has a circular shoulder 24' on its upper end and is axially and frictionally movable on the lower portion of the wall of support 2. A second resilient split metal ring 25 is axially and frictionally movable on the inner wall of ring 24 and its upper end is provided with an enlargement 25' thereby forming

a groove for holding rubber ring 14. This groove can be adjusted as to its height by the axial adjustment of ring 25 relative to the ring 24. The outer periphery of the rubber ring 14 lies in the groove formed by the rings 24 and 25 and in the tube groove 26' whereby the tube 26 is universally tiltably supported. By being able to adjust the height of the groove formed by the rings 24 and 25, the rubber ring 14 may be more or less compressed and thereby the force required to tilt the tube 26 can be adjusted as desired. The universal tiltability of the tube 26 in Fig. 3 and tube 17 in Fig. 1 converts in effect the cylindrical abrasives of said tubes into a frusto-conical abrasive surface. Smooth strips 16 at the upper end of tube 26 in Fig. 3 and tube 17 in Fig. 1 serve to prevent the lead 4 from being cut off or eaten up by the abrasive 18 in Fig. 1 or the abrasive 28 in Fig. 3 when sharpening the pencil lead. Strip 16 will also indicate when the lead 4 has been sharpened, because any further sharpening will have no effect since the upper part of lead 4 will slide around the smooth strip 16 and hold the tube 17 in Fig. 1 and tube 26 in Fig. 3 tilted and the point of the lead would have no chance of passing against the abrasive and the socket may have reached the limit of its tiltability as determined by the collar 11. Strip 16 in Fig. 1 and in Fig. 3 happens to have the same diameter as that of the abrasive 18 in Fig. 1 and that of the abrasive 28 in Fig. 3, and therefore, the strip 16 will be effective only when the lead 4 is very short.

In Fig. 5 there is shown a driving gear arrangement for tilting the socket 31. A bevel gear 35 has a handle shaft 38 secured eccentrically and on which tubular handle 40 is freely rotatable. A circular retainer 39 is fastened to the end of the shaft 38 to retain the handle 40 thereon. A sleeve support carries shaft 36. The bevel gear 35 is rotatable on the shaft 36 and is held in place thereupon by a circular retainer 37 fixed to the end of the shaft 36. A cap 30 is fitted on the upper end portion of support 29. This cap has an upwardly extended circular neck 30'. Bevel gear 33 rests on the top of the cap 30 and is freely rotatable on the neck of the cap 30. A cam pin 34 is eccentrically fastened upon and upwardly projects from the top of gear 33. Gear 33 meshes at right angles with gear 35. Socket 31 is radially outwardly flanged at its upper end as indicated at 32 and this flange rests on a cam pin 34 as the gears are rotated socket 31 will be tilted relative to the support 29. The handle 40 is turned to thereby rotate gear 35 and which in turn rotates gear 33. Cam pin 34 rotates with the gear 33, but will not rotate socket 31. Cam pin 34 merely slides on the under side of flange 32, keeping the socket 31 universally tilted, thus imparting to the socket 31 a wobbling movement. The pencil body 6 will be sharpened in the manner as above described.

While various changes may be made in the detailed construction, it shall be understood that such changes shall be within the spirit and scope of the present invention as defined by the appended claims.

I claim:

1. A pencil lead sharpener comprising a support having a top portion with a guide opening therein, a pencil socket carried by the top portion and suspended downwardly through the guide opening, said pencil socket loosely fitting said guide opening to permit free tilting and rotary movement thereof, said socket being open at its lower end through which the lead end of the pencil may be projected, pencil-receiving means on the lower

end of the socket for loosely supporting the lead end of the pencil for free rotation with respect to the socket and an abrasive surface carried by said support for engagement by the pencil lead, whereby as the said socket is tilted and rotated the pencil is free to rotate within said socket and to roll over said abrasive surface.

2. A pencil lead sharpener as defined in claim 1 and a tube containing said abrasive surface on its inner surface and resilient means for connecting said tube to the support for universal tilting movement upon engagement of the pencil lead with the abrasive surface while the socket with the pencil contained therein is being tilted and rotated.

3. A pencil lead sharpener as defined in claim 2 and abutment means on the pencil socket engageable with the support to limit the outward movement of the socket.

4. A pencil lead sharpener as defined in claim 1 and a tube containing said abrasive surface, said tube having an external groove, said support having an internal groove opposing the external groove of the tube and a resilient tubular ring extending between said grooves and supporting the abrasive tube in a resilient universally tiltable manner.

5. A pencil lead sharpener as defined in claim 1, and a tube containing said abrasive surface, ring means adjustably mounted on said support, said ring means having an internal groove, said tube having an external groove lying opposite the internal groove in the ring means, and resilient means lying between the grooves of the ring means and the tube to tiltably and resiliently support said abrasive tube.

6. A pencil lead sharpener as defined in claim 5, and said ring means comprising two rings relatively adjustable to each other, and said ring means providing the internal groove of the support, the rings upon being adjustable and serving to compress said resilient means whereby to alter the force required to tilt the tube.

7. A pencil lead sharpener as defined in claim 1, and gear driven cam means rotatable upon said support, said socket having a flange engageable by the cam means to universally tilt said socket.

8. A pencil lead sharpener as defined in claim 1, and said top portion having a neck portion surrounding said guide opening, a gear rotatable about said neck portion, said gear having a cam member, means on the support to rotate said gear, said pencil socket having a flange on its top portion, said gear cam being engageable with said flange, whereby as the gear is rotated the pencil socket will be tilted and cause the pencil lead to be moved in a circular path over the abrasive surface.

DANIEL WELLMANN VON KAMENICZKY.

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