Oct. 15, 1968 C. R. DENNISON 3,405,747

PENCIL LEAD SHARPENER

Filed April 25, 1966

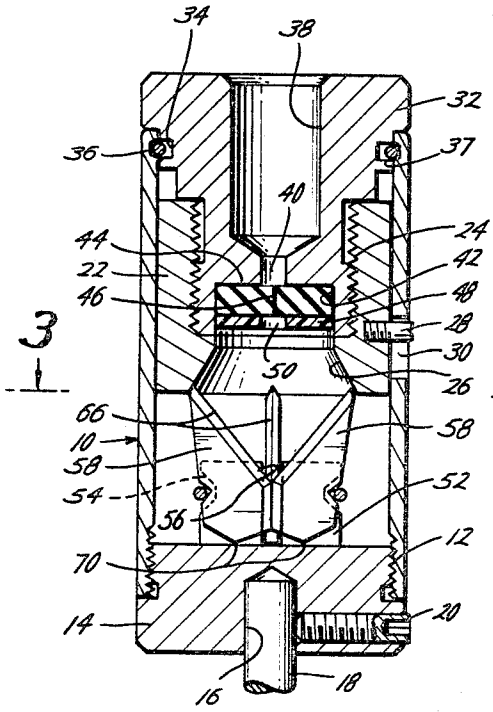


Fig. 1

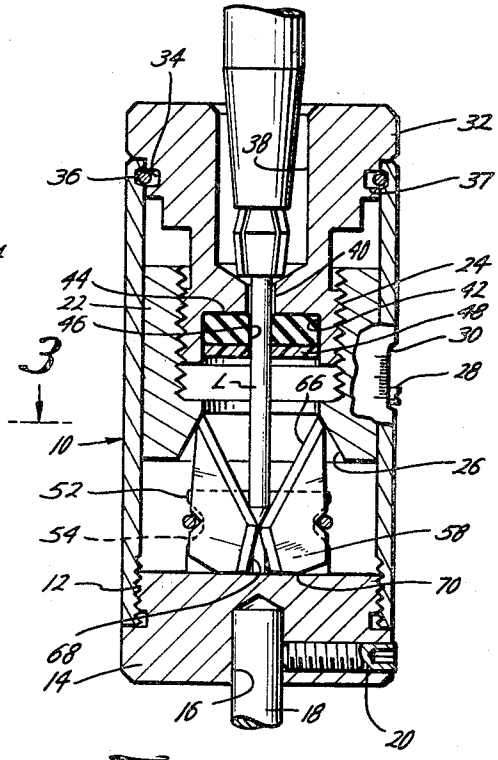


Fig. 2

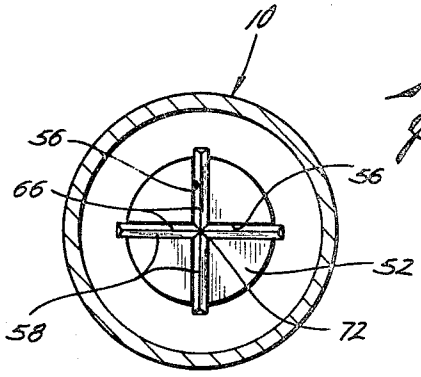


Fig. 3

Carroll R. Dennison
INVENTOR.

BY Charles E. Lightfoot
ATTORNEY

United States Patent Office 3,405,747 Patented Oct. 15, 1968

3,405,747

PENCIL LEAD SHARPENER

Carroll R. Dennison, 5426 Bataan St., Houston, Tex. 77033

Filed Apr. 25, 1966, Ser. No. 544,758
5 Claims. (Cl. 145—3.8)

This invention relates to a device for pointing or sharpening the ends of rod-like articles such as pencil leads, and more particularly to a pointer for pencil leads which is adjustable to vary the taper of the point which is formed thereon.

The invention has for an important object the provision of a device for forming points on pencil leads which is adjustable to form a point having a predetermined taper and wherein means is embodied for assuring that the tapered point of the lead will be concentric with the longitudinal axis of the lead.

Another object of the invention is to provide a pencil lead sharpening device which is designed to prevent clogging of the point forming means due to breaking off of portions of the pencil lead therein during a sharpening operation.

A further object of the invention is the provision of a point forming or sharpening device of the character referred to embodying a closed receptacle designed to retain the particles formed therein during the sharpening operation and which may be readily emptied when desired.

A still further object of the invention is to provide a point forming or sharpening device of the type mentioned which is of simple design and rugged construction and which is of economical manufacture.

The above and other obvious advantages of the invention may best be understood from the following detailed description of a preferred embodiment thereof, constituting a specification of the invention, when considered in conjunction with the annexed drawing, wherein—

FIGURE 1 is a vertical, central, cross-sectional view of the point forming device of the invention, showing details of construction of the same, the device being shown as adjusted to form a relatively blunt or short tapered point;

FIGURE 2 is a view similar to that of FIGURE 1 showing the device adjusted to form a relatively elongated or long tapered point and showing the manner in which the device is used in conjunction with a pencil lead to sharpen the same; and

FIGURE 3 is a cross-sectional view, taken along the line 3—3 of FIGURE 1, looking in the direction indicated by the arrows.

Referring now to the drawings in greater detail, the invention is illustrated herein in connection with its application to the pointing or sharpening of pencil leads, it being understood that the device may be constructed for the pointing of other rod-like articles, or for other purposes where it may be desirable to produce points of various degrees of taper on articles of such character.

The sharpener or pointer of the invention comprises a generally cylindrical, hollow housing **10**, whose lower end is internally threaded, as shown at **12**, for the attachment thereto of an externally threaded, removable, lower end cap **14**. The cap **14** may be provided with a central recess **16** for the reception of the end of the shaft **18** of an electric motor or other driving element by which the device may be rotated and may also have a set screw **20** by which the shaft is securely held in the recess.

Within the housing **10** a tubular adjustment member **22** is slidably disposed for longitudinal adjustment therein, which member is internally threaded at its upper end,

as shown at **24**, and is formed at its lower end with an upwardly tapering internal cone portion **26**. The member **22** may be provided with a laterally extending projection or pointer **28**, which in the present illustration takes the form of a machine screw threadably attached to the member and extending into a longitudinally elongated slot **30** in the housing. The housing may be provided with an appropriate scale or other index **32** by which the position of the member **22** therein is shown, whereby the taper of point to be produced is determined. The screw **28** working the slot **30** also holds the member **22** against rotation in the housing and the screw may be removed when it is desired to disassemble the parts.

The housing is closed at its upper end by a rotatable plug **32** which is extended into the upper end of the housing and which has an external annular groove **34** for the reception of a snap ring **36** which also fits into an internal annular groove **37** in the housing to hold the plug in place.

The plug **32** has a reduced lower end portion which is externally threaded for threadable connection to the member **22**. The plug also has an upper end counterbore **38** which is in communication through a reduced, central passageway **40** with a lower end counterbore **42** in the plug.

Within the lower end counterbore **42** a centrally perforated flexible washer **44** is seated, which is formed of resilient material, such as rubber, whereby the central perforation **46** thereof will be closed when the device is not in use. A second, centrally perforated washer **48** formed of rigid material, such as metal, is disposed in the counterbore **42**, in position to retain the washer **44** in place and whose central perforation **50** is of a size to allow the free insertion of a pencil lead L therethrough when the lead is inserted through the perforation **46** of the soft washer **44**.

The lower end cap or closure **14** has an upstanding central lug **52** which is formed with an external annular groove **54** and cross slots **56**, best shown in FIGURE 3 within which cross slots cutting blades **58** are loosely fitted to extend upwardly in vertical planes above the upper end of the lug. Each of the blades **58** has an external notch **60** in its outer side through which a flexible snap ring **62** or the like extends, which ring is positioned in the groove **54** of the lug **52** to yieldingly hold the blades in the slots. The blades **58** are formed with upwardly diverging cutting edges **66** and are also formed with inner edge portions **68** disposed below the cutting edges **66** which are positioned to be in abutting relation to limit the inward movement of the blades in the slots **56**. The lower end edges of the blades may be rounded or formed with apices **70** which bear on the lug **52** in the bottoms of the slots **56** when the blades are adjusted by tilting the same away from each other to increase the angle between the cutting edges.

The upper ends of blades extend into the conical recess **26** in engagement therewith for coaction with the member **22** to tilt the blades **58** radially inwardly upon downward movement of the member **22** in the housing to reduce the angle between the cutting edges **66** and to allow the blades to tilt outwardly upon upward movement of the member **22** in the housing to increase the angle between the cutting edges **66**. By moving the member **22** upwardly or downwardly in the housing it will be apparent that the angle of the blades may be suitably adjusted to provide a point of a desired taper on the pencil lead when the device is rotated with the lead inserted in the housing into engagement with the cutting edges, as shown in FIGURE 2.

The blades **58** are shaped so that the cutting edges **66** will meet at their lower ends in central apex **72** located on

the longitudinal axis of the device, as best seen in FIGURE 3.

In making use of the sharpener or pointer of the invention constructed as described above, the pencil lead L, which may be of a type which is held in a chuck C of a lead holder such as those commonly used by draftsmen and others, is inserted through the closure **32**, through the central perforation of the washers **44** and **48** to engage the point of the lead with the cutting edges **66**, whereby upon rotation of the housing a tapered point will be formed on the lead. Upon removal of the lead L after sharpening, the central aperture of the washer **44** will be closed, as seen in FIGURE 1, to prevent spilling of the particles or cuttings retained in the housing.

Should it be desired to remove the blades **58** for resharpening or replacement, the bottom cap **14** may be unscrewed and removed to allow the blades to be removed from the slots **56**. The cuttings formed during sharpening may also be removed in the same manner.

It will be apparent that any pieces of the point of the pencil lead which may break off during the sharpening operation will be free to fall out from between the blades so that clogging of the device is prevented.

Due to the apex **72** formed by the cutting edges of the blades in all positions of adjustment of the blades a very sharp point may be formed on the lead regardless of the degree of taper provided.

It will thus be seen that the invention provides a pencil lead pointer or sharpener of simple construction which is easily adjustable to form any desired degree of taper and by which sharp points on pencil leads or other rod-like objects may be rapidly formed.

The invention is disclosed herein in connection with a particular embodiment of the same which is intended by way of illustration only, and it will be understood that various modifications can be made therein without departing from the spirit of the invention or the scope of the appended claims.

Having thus clearly shown and described the invention, what is claimed as new and desired to secure by Letters Patent is:

1. In a pencil lead sharpening device a hollow housing having an opening at one end a plug rotatably mounted in said opening and having a passageway through which a pencil lead may be inserted endwise, a plurality of blades pivotally mounted in the housing for radial movement therein in planes parallel to the axis of said opening and having longitudinally extending cutting edges converging toward a point on said axis, blade positioning means movably disposed in the housing for longitudinal movement therein and thread means operatively connecting said plug and said blade positioning means whereby rotation of said plug in one direction imparts longitudinal movement to said positioning means in one direction to vary the angle of said cutting edges relative to said axis.

2. The sharpening device of claim **1**, wherein said positioning means is shaped for coaction with said blades to move the blades radially inwardly upon movement of the movable means in one direction and to allow outward radial movement of the blades upon movement of the positioning means in the other direction.

3. The sharpening device of claim **1** wherein said blades are tapered longitudinally toward one end and said positioning means is formed with an internal conical face positioned for engagement with said one end of the blades to move the blades radially inwardly upon movement of said positioning means in one direction in the housing.

4. The sharpening device of claim **1** wherein means is provided on said housing and positioning means located for coaction to indicate the position of said positioning means in the housing.

5. The sharpening device of claim **1** wherein said blades are mounted for radial swinging movement in said planes and said cutting edges are positioned to converge to a point on said axis in all positions of the blades in the housing.

References Cited

UNITED STATES PATENTS

2,188,130	1/1940	Baier et al.	145—3.31

FOREIGN PATENTS

831,672	3/1960	Great Britain.
151,706	3/1932	Switzerland.

ROBERT C. RIORDON, *Primary Examiner.*

R. V. PARKER, JR., *Assistant Examiner.*