Dec. 29, 1942. H. J. KATTENHORN 2,306,954

WOOD PENCIL WITH LEAD FEEDING MECHANISM

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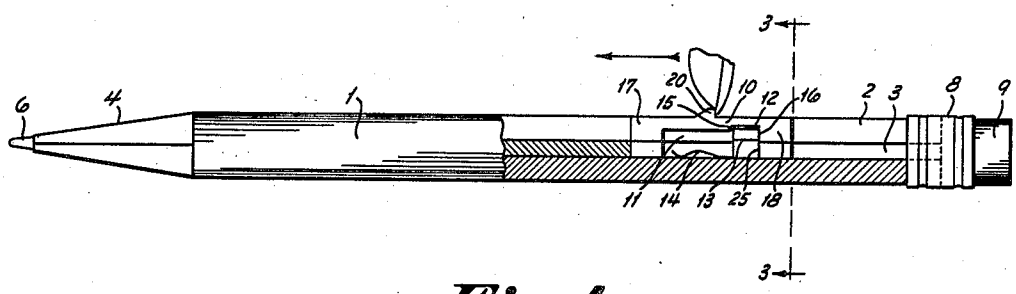


Fig. 1

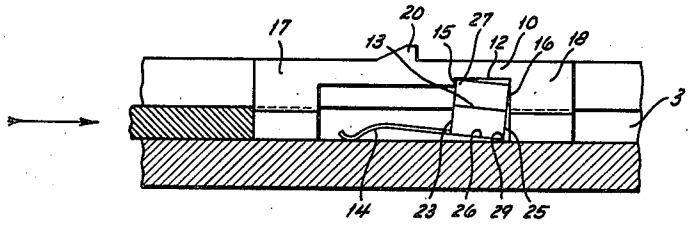


Fig. 2

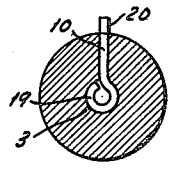


Fig. 3

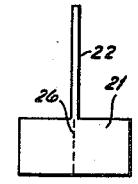


Fig. 4

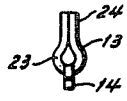


Fig. 5

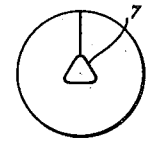


Fig. 6

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WOOD PENCIL WITH LEAD FEEDING MECHANISM

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6 Claims. (Cl. 120—19)

This invention relates to writing instruments such as pencils.

The pencil most extensively used is made of wood containing a center-positioned lead rigidly secured in place. As the lead is consumed in writing, the wood must be cut away to expose the proper amount of the lead as well as to permit pointing of the exposed portion. This sharpening of the pencil must be made at frequent intervals and the pencil is soon worn down sufficiently to be unsightly and out of balance. It therefore is generally discarded when about half used up.

Mechanical pencils of metal, with thin leads requiring no pointing, have been proposed and used to a limited extent, but they are relatively heavy and the lead grip soon wears and permits the lead to turn. Consequently, the ordinary wood pencil is still favored by pencil users.

It is an object of this invention to so construct a wood pencil, or pencil of similar light material, that it does not require sharpening and permits the lead to be substantially consumed, after which the pencil may be discarded.

Another object of the invention is to construct a feeding device for the lead of a wood pencil, so that it permits ready feeding of the lead but instantly checks backward motion due to pressure on the writing surface.

A further object of the invention is to so construct the lead feeding device that it may be made sufficiently small to function with the thin leads now found on the market without impairing the feeding and holding functions.

Other objects will be found in the specification, with reference to the drawing, in which:

Fig. 1 is a side view of a pencil embodying the invention with parts cut away to show the position of the operating parts when the lead is being extruded.

Fig. 2 is a partial section of the pencil showing the position of the parts when back pressure is applied to the lead by contact with the writing surface, the action being exaggerated for purposes of explanation.

Fig. 3 is a section taken on the line 3—3 of Fig. 1 viewed in the direction of the arrows.

Fig. 4 shows the shape of the stamped checking or locking element before it is formed into the shape shown in Figs. 1 and 2.

Fig. 5 is an end view of the locking element viewed from the left side of Figs. 1 and 2.

Fig. 6 is an end view of the pencil tip showing its construction for functioning with a triangular-shaped lead.

Referring to the drawing, the pencil 1 is preferably made of wood because of its lightness and low cost and other qualities that have made it the choice of the majority of pencil users. The wood need not be made of the high grade stock required for ordinary pencil manufacture and cheaper grades may be used when desired.

The wood is shaped to the usual wood pencil size and may be either round, hexagonal, or any other desired contour, but in the drawing, for simplicity, I have shown it as being round. The pencil is slotted throughout its length with a perpendicular cut 2 as by a saw and the central groove 3 is produced, either before or afterwards, in circular form by any means, though this central part could be square or other shapes when desired. This central groove will be relatively small and all dimensions, of course, will not be as large as is indicated in the drawing. It is preferably of such size as to receive the usual thin lead found on the market for use in mechanical pencils.

The pencil is pointed and a conical metal tip 4 is cemented or otherwise attached thereto. This tip may be rolled into shape from flat metal stock having sufficient resiliency to grip the lead 6 and prevent it from turning during the use of the pencil. It is preferable to have the central opening 7 in this tip of non-circular form. In Fig. 6 I have indicated the shape as triangular with rounded corners, though it may be square, hexagonal or any other non-circular form. The lead used in the pencil should have substantially the same shape as the opening in the tip.

The pencil 1 may, if desired, have a metal ferrule 8 crimped on the pencil to hold a suitable rubber eraser 9.

The feeding element 10 is made from flat metal stock slightly thinner than the width of the slot 2, so as to move freely therein. This flat stock is cut out at the center portion to form an opening 11, which is slightly enlarged to form a notch 12 to receive the checking device 13 and its spring 14, later to be described in detail. This enlarged opening or slot has a short perpendicular front side 15 and a perpendicular rear side 16. The two legs 17, 18 are formed into general, though not exact, circular form 19 of approximately the diameter of the lead groove 3, as shown in Fig. 3. The feeding device is so dimensioned that it will slide freely the length of the pencil, as by pressure of the thumbnail against the protruding abutment 20, as indicated in Fig. 1. The feeding device, however, will remain in the pencil, as the legs 17, 18 prevent it from dropping out through the slot 2.

The locking element 13 is preferably stamped out of flat stock in the form shown in Fig. 4 with a rectangular portion 21 and an integral strip 22. This stock is of spring metal, as the extension 22 forms the spring 14 that tilts the checking unit to prevent backward motion of the lead. The rectangular portion is bent into somewhat U-shape, as indicated particularly in Fig. 5, so that it has a substantially circular portion

23 to fit the lead groove 3 and a flat portion 24 adapted to fit into the enlarged opening or notch 12 in the feeding unit 10. This flat portion has a rear side 25 perpendicular to the bottom 26. The integral extension 22 is preferably bent into the form shown at 14 in Fig. 2, so as to exert a mild pressure to tilt the locking member when backward pressure of the lead is produced by engagement of the front side 15 of the notch 12 with the top portion 27 of the edge of the locking element 13, as indicated in Fig. 2.

Whenever the lead wears down sufficiently to require feeding, the projection 20 on the feeding device 10 may be pushed to the left in Fig. 1, for example, by the thumbnail. The flat rear side 16 engages the side 25 of the lock and thus compresses weak spring 14 and aligns the lock so that it will move freely forward with the feeding movement of element 10. When pressure is applied against the writing surface, the force transmitted through the lead tends to move the feeding unit 10 backwards, but the rear bottom edge 29 of the lock is maintained constantly against the bottom of the groove by the tilting action of spring 14 and rearward motion cannot take place to a noticeable extent. This is true because the backward pressure exerted between the points 15 and 27 will, through slight tilting action, cause the locking to instantly take place. The lost motion between the parts 15 and 27 will not exceed a few thousandths of an inch in commercial practice and hence the backward movement of the lead in producing the locking action will not substantially exceed this minute amount before it is solidly checked.

The lead may be fed continuously through the pencil as it is consumed. After the lead is fed down sufficiently to permit the feeding device 10 to contact with the tip member 4, the pencil should be thrown away, as a new lead cannot be inserted in the pencil. The pencil, of course, greatly outlasts a wood pencil that requires sharpening and its cost is sufficiently low that its use is more economical than the ordinary pencil and at the same time, my improved pencil gives more satisfactory use as its length, balance and appearance remain unchanged throughout its life.

It will be apparent that the locking member need not be rectangular as shown. It may be of various shapes so long as the forward pressure tends to tilt the lock forwards and the backward pressure tends to tilt it backwards to cause the corner or edge to bite against the wall of the groove. Also, instead of the upper part of the lock fitting into a notch in the feeder element, the reverse could be used.

It will be apparent that various other modifications may be made in the construction without departing from the spirit of the invention.

Having described my invention, what I claim is:

1. In writing devices, a pencil shaft having a central groove adapted to receive a lead and a slot extending into said groove, a feeding member having a top portion fitting in said slot and a bottom portion fitting in said groove and adapted to engage the rear end of said lead, said bottom portion having a recess, a lock in said recess having an end engaging the bottom of said groove, and a spring, said spring tilting said lock to maintain said end against the wall of said groove.

2. In writing devices, a pencil shaft having a central groove adapted to receive a lead and a slot extending into said groove, a feeding member having a top portion fitting in said slot and a bottom portion fitting in said groove and adapted to engage the rear end of said lead, said bottom portion having a notch, a lock in said notch having a corner engaging the bottom of said groove and a spring fastened to said lock and engaging the surface of said groove for tilting said lock to force said corner against the bottom of said groove upon rearward motion of said feeding member.

3. In writing devices, a pencil shaft having a central groove adapted to receive a lead and a slot extending into said groove, a feeding member having a top portion fitting in said slot and a bottom portion fitting in said groove and adapted to engage the rear end of said lead, said bottom portion having a notch with front and rear sides, a lock in said notch having front and rear sides and a base, said base slidingly fitting said groove when its rear side is moved forward by the rear side of said notch, and a spring tilting said lock to cause said base to bind against the bottom of the groove when the rear side of said notch is moved away from the rear side of said lock.

4. In writing devices, a pencil shaft having a central groove adapted to receive a lead and a slot extending into said groove, a feeding member having a top portion fitting in said slot and a bottom portion fitting in said groove and adapted to engage the rear end of said lead, said bottom portion having a notch with front and rear sides, a lock in said notch having front and rear sides and a base, said base slidingly fitting said groove when its rear side is moved forward by the rear side of said notch, and a leaf spring fastened to said lock and engaging the bottom of the groove for tilting said lock to cause said base to bind against the bottom of the groove when the rear side of said notch is moved away from the rear side of said lock.

5. In writing devices, a pencil shaft having a central groove adapted to receive a lead and a slot extending into said groove, a feeding member having a top portion fitting in said slot and a bottom portion fitting in said groove and adapted to engage the rear end of said lead, said bottom portion having a notch with the rear side perpendicular to said groove and a front side cut away at the bottom, a lock having front and rear sides loosely fitting in said notch and a base slidingly fitting said groove when its rear side is moved forward by the rear side of said slot and a spring tilting said lock to cause its base to engage the bottom of the groove at an angle when its front side is engaged by the front side of the notch upon rearward motion of said feeding member.

6. In writing devices, a pencil shaft having a central groove adapted to receive a lead and a slot extending into said groove, a feeding member having a top portion fitting in said slot and a bottom portion fitting in said groove and adapted to engage the rear end of said lead, said bottom portion having a notch with a rear side perpendicular to said groove and a front side cut away at the bottom, a lock of substantially rectangular form loosely fitting in said notch and having a base slidingly fitting said groove when its rear side is parallel to the rear side of said slot, and a spring tilting said lock to cause its base to engage the bottom of the groove at an angle when its front side is engaged by the front side of said notch upon rearward motion of said fedeing member.

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