April 12, 1932. P. S. HAUTON 1,853,560

MECHANICAL PENCIL

Filed March 23, 1923

Fig. 1.

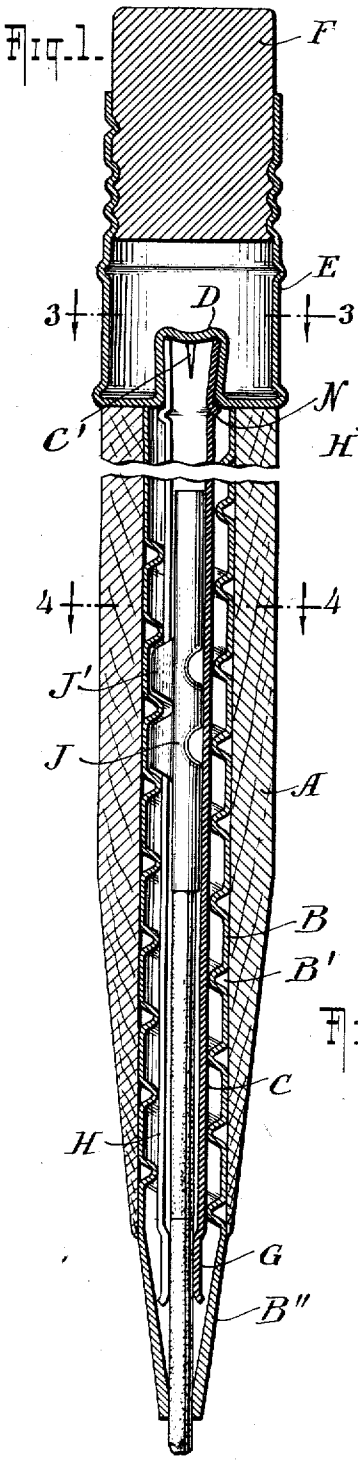


Fig. 2.

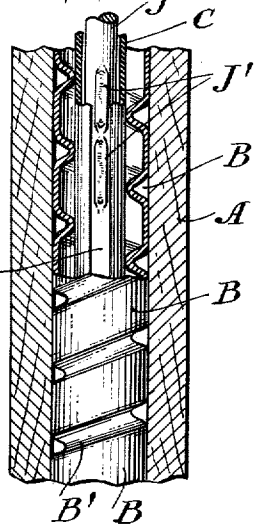


Fig. 3.

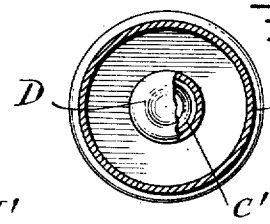


Fig. 4.

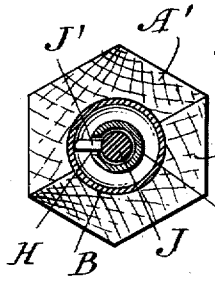


Fig. 5.

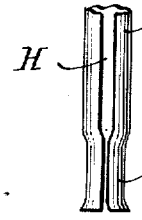
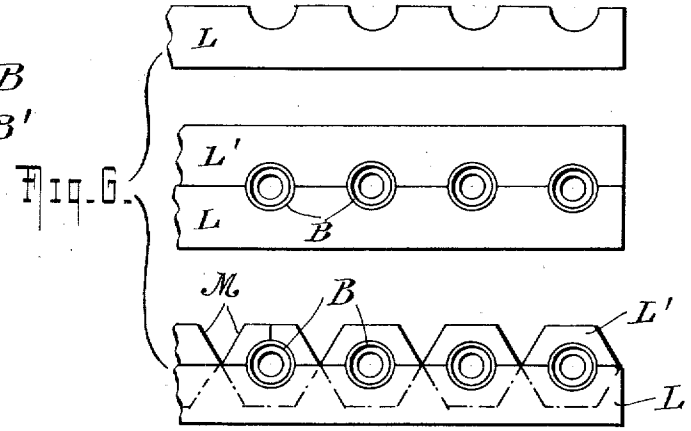


Fig. 6.



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By his Attorney

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Patented Apr. 12, 1932 1,853,560

UNITED STATES PATENT OFFICE

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MECHANICAL PENCIL

Application filed March 28, 1928. Serial No. 627,188.

This invention relates to mechanical pencils and their method of manufacture.

In its broader aspect, one phase of the present invention resides in the provision of a pencil shell or casing which consists of two or more complementary parts united to each other along vertical edges on opposite sides of an element of a lead propelling mechanism, the remainder of the elements of the propelling mechanism being preferably unitary and separable from the element united to the shell parts.

Another major phase of the present invention resides in the provision of a rotatable lead magazine adapted to receive a plurality of juxtaposed leads and containing a follower adapted to bear on one end of one of the leads and simultaneously move all the leads in the magazine towards the writing end of the pencil and successively bring a succeeding lead to a writing position after the preceding lead has been exhausted or otherwise disposed of.

Another major phase of the present invention resides in uniting the lead containing magazine to an eraser ferrule by distorting one or both of these elements, the eraser ferrule serving as a manually operable member to rotate the magazine and its appurtenances and move the leads to a writing position.

Another major phase of the invention resides in forming a tapered part at one end of an element of the lead feeding mechanism to form a guide tip to support part of the lead and to finish the shell or casing.

While one embodiment of the invention is illustrated in the accompanying drawings it is to be understood that this embodiment merely serves as an illustration of the underlying principles of the invention so that they may be readily comprehended by those skilled in the art and is not intended as limiting the invention to the specific form disclosed therein.

In said drawings:

Fig. 1 is a vertical section of the pencil partly fragmentary.

Fig. 2 is a fragmentary sectional view showing some of the elements in a different position from that shown in Fig. 1.

Fig. 3 is a section of Fig. 1 on the line 3—3.

Fig. 4 is a section of Fig. 1 on the line 4—4.

Fig. 5 is a fragmentary detail view of one of the elements shown in Fig. 1, and

Fig. 6 shows the manner of assembling some of the parts.

Continuing now by way of a detailed description, a shell or casing A preferably comprises a plurality of shell strips A′ united along their vertical edges and enclosing the major portion of a lead feeding mechanism element. While the shell A in the preferred embodiment consists of a plurality of strips as indicated, the invention is not limited to the use of a plurality of shell parts since a unitary shell may be used as will be readily understood. Irrespective as to whether the shell or casing is unitary or built up from a number of strips, a feed tube B having a thread B′ formed therein is located within the shell bore. The writing end of the tube B is tapered to form a guide tip B″, the tube being carried beyond the shell so as to give a finished appearance to the pencil and to afford a means to guide and support the lead which is designed to project through its apertured end.

A lead magazine C, adapted to be inserted in the tube B has one end split to form a bipartite end C′ adapted to be distorted by spreading the split parts within a reentrant dome shaped part D formed in the eraser ferrule E, which in turn carries the eraser F in the usual manner. The distortion of the end of the magazine securely locks the magazine and ferrule together so that the ferrule serves as a manually operable member to rotate the magazine. While the dome D is shown as upstanding nevertheless it might also be dependent, the magazine in this case being forced over the outside of the dependent dome as will be readily understood. While the dependent arrangement of the dome is within the contemplated scope of the invention, the illustrated embodiment is preferred as affording a larger capacity to the magazine. The end of the magazine located at the writing end of the pencil has also one end split to form the bipartite clutch G in the manner shown in Fig. 5, the clutch

parts being shaped to fit the leads and to afford a substantial frictional engagement with the lead to firmly yet resiliently support the lead in conjunction with the apertured end particularly during the writing operation. The end of the clutch G is preferably bell shaped to facilitate the insertion of the leads in the magazine, which is loaded by pushing the requisite number of leads into the magazine through this clutch.

The magazine has a vertical guide slot H and a follower J is arranged to bear against the rearmost lead to feed the series of leads toward the tip. This follower preferably consists of a cylinder having one or more wings J′ projecting through the slot and engaging the threads of the feed tube B. The rotation of the eraser ferrule and the attached tube C carries the follower around, and the engagement of the follower wings in the tube threads feeds the follower toward the writing end of the pencil which in turn ejects the foremost lead of the series from the tip B″ the desired distance.

It will be observed that the eraser ferrule, magazine and follower form a unitary structure which may be removed bodily from the feed tube by rotating the tube and follower until the follower wings become disengaged from the tube. The magazine on removal from the shell, may be filled with the requisite number of leads. As has already been indicated the shell or casing consists of a plurality of shell parts united to each other along vertical edges and this construction is preferred as peculiarly lending itself to the expeditious method of production shown in Fig. 6.

In view of the fact that the lead feeding mechanism consists of a unitary assemblage of elements cooperating with a feed tube it is contemplated simultaneously forming the shell parts for a plurality of pencils instead of forming each shell individually. The present invention contemplates forming a plurality of preferably parallel recesses or grooves in a rough shell part L, inserting a feed tube B preferably in each of these recesses, forming a plurality of parallel recesses in a second rough shell part L, uniting the two and then shaping the rough shell to give the desired shape to the individual pencil. The shaping operation may simply consist of running a V shaped groove between the recesses to form faces M. The spacing of the grooves or recesses is preferably so arranged that the shaping operation will also separate the individual pencils. The separation of the pencils from each other by a V shaped groove in the manner indicated results in the conventional pencil having a hexagonal cross section. However the present invention is obviously not limited to the production of a pencil having a hexagonal cross section but the shape of the grooving tool may be so selected as to afford other shapes of pencil.

The lead propelling mechanism is assembled by inserting the lead follower J in the magazine C, then forcing the dome D over the bipartite end and then applying pressure on the dome cap to spread the bipartite end, the annular rim or shoulder N formed in the magazine serving to limit the downward movement of the dome so that a slight clearance remains between the end of the magazine and dome and permitting the bipartite ends to be readily spread to lock with the dome. The assembled feed mechanism may be then readily inserted in the feed tube B and removed as desired to refill the magazine through the clutch G although it is quite evident that the magazine might be refilled by pushing the leads through the apertured ends of the tip B″ of the assembled pencil.

When I speak in my claims of uniting a shell part to another shell part it is to be understood that either or each of the shell parts may consist of a plurality of shell parts.

It is claimed:

1. The method of manufacturing a mechanical pencil which comprises the step of first forming a recess in a shell part, coating said recess with an adhesive and then forcing an internally and externally grooved feed tube into said recess to force the adhesive into the grooves of the feed tube to form a bond between the feed tube and then applying a second shell part, to form the pencil.

2. A mechanical pencil comprising a shell, a stationary threaded feed tube within the shell having grooves pressed in to the tube to form threads on the interior and grooves on the exterior, the feed tube tapered at the forward end and the tapered part projecting beyond the shell, and an adhesive binder between the tube and the shell.

3. A mechanical pencil comprising a shell consisting of longitudinally divided shell parts united along their longitudinal edges, a threaded feed tube secured in the shell, a tubular lead holder having a guide slot within the feed tube, a rotatable member having a reentrant part to receive the rear end of the tubular lead holder, a lead follower within the lead holder having a wing engaging the guide slot and in threaded engagement with the threads of the feed tube, one end of the feed tub being tapered to form a guide tip and the other end being spread into the reentrant part and locked thereto.

4. In a method of manufacturing mechanical pencils, the steps of first forming a recess in a shell part, coating the recess with an adhesive, then forcing a feed tube having an external spiral groove into the recess and then applying a second shell part to the first shell part with pressure to cause the adhesive to enter the groove.

5. The method of assembling the parts of a mechanical pencil which comprises the step of first placing the end of a tubular lead magazine in a flared re-entrant part of an eraser holder, then spreading the lead magazine diametrically within the re-entrant part of the eraser holder to lock the two together to prevent relative longitudinal movement of the parts.

6. A pencil comprising a shell, a cap member turnable thereon and having a flared re-entrant part and a lead tube turnable in the shell and having an end projecting into said re-entrant part, said end being spread within the flared re-entrant part to lock the two together.

7. A mechanical pencil combining a casing having a longitudinal bore, a feed tube having threads formed therein snugly fitted in a portion of said bore projecting beyond said bore and held against rotation thereby, and means comprising a manually operable member at the end of the pencil remote from the writing end for moving the lead.

8. A mechanical pencil combining a casing, a feed tube having displaced portions forming an external groove in the feed tube and an internal bead on the interior thereof snugly fitted in the casing and held against rotation thereby, a slotted rotatable lead holder located within the feed tube, and a manually operable member at the end of the tube remote from the writing end the rotatable lead holder extending beyond the end of the feed tube and casing.

9. A mechanical pencil combining a casing having a longitudinal bore, a feed tube snugly fitted in the bore having portions thereof displaced, the displaced portions forming an external groove in the feed tube and an internal bead on the interior thereof, a slotted rotatable feed member concentrically located within the feed tube and projecting beyond said feed tube at the end of the pencil remote from the writing end, a manually operable member secured to the projecting end of the feed member remote from the writing end, and an exposed guide tip at the writing end of the pencil.

10. A mechanical pencil combining a casing having a longitudinal bore coextensive therewith, an exposed guide tip at the writing end of the pencil, a feed tube having portions thereof displaced, the displaced portions forming an external groove and an internal bead, the feed tube being snugly fitted in a portion of the bore, a rotatable lead holder within the feed tube projecting beyond the end of the tube at the end of the pencil remote from the writing end, the end of the writing end of the lead holder being located within the tapered guide tip, and a manually operable member secured to the end of the lead holder remote from the writing end and in sliding contact with a portion of the casing and one end of the threaded feed tube and guided thereby.

11. A mechanical pencil combining a casing, a feed tube having displaced portions to form threads within the casing, a rotatable lead holder having a slot and located within the feed tube and a member having a wing projecting through the slot of the lead holder and engaging the threads of the feed tube to move the lead, the rotatable lead holder being in sliding contact with the threads of the feed tube and being guided thereby.

12. A mechanical pencil combining a casing, a non-rotatable tapered lead guide tip at the writing end of the pencil, a feed tube having displaced portions forming threads within the casing bore and coextensive therewith, a slotted rotatable lead holder within said threaded feed tube and projecting beyond the feed tube and a manually operable member at the end of the pencil remote from the writing end secured to the projecting end of the rotatable slotted lead holder to rotate the same.

13. In a mechanical pencil combining a casing having a longitudinal bore, a tapered lead guide tip at the writing end of the pencil, a threaded feed tube within the casing bore, a slotted rotatable lead holder projecting beyond the end of the casing bore, and a manually operable member at the end of the pencil remote from the writing end secured to the end of the rotatable slotted lead holder projecting beyond the casing bore to rotate the same.

14. A mechanical pencil combining a casing having a longitudinal opening, a feed tube within the bore and relatively stationary with respect to the casing, a rotatable feed tube slotted on one side only concentrically located within the feed tube, a manually operable member secured to the rotatable feed tube at the end of the tube remote from the writing end, and a rigid stationary tapered exposed guide tip at the writing end of the pencil, the end of the slotted tube at the writing end of the pencil being wholly located within the guide tip.

15. A mechanical pencil combining a casing, having a longitudinal opening, a feed tube having displaced portions forming threads, the feed tube terminating in a tapered rigid exposed guide tip at the writing end of the pencil, and projecting beyond the casing, a rotatable member having a slot within the feed tube, a member having a wing projecting through the slot of the last named member and engaging the threads of the feed tube, to move the lead on rotation of the rotatable member.

16. A mechanical pencil combining a casing having a longitudinal opening, a feed tube having a displaced portion forming threads on the interior thereof, a rotatable lead holder having a slot on one side thereof

which tapers to a slot of smaller width near the writing end of the pencil located within the feed tube and projecting beyond the casing, and a manually operable member secured to the projecting end of the rotatable lead holder at the end of the pencil remote from the writing end.

17. A mechanical pencil combining a casing having a longitudinal opening, a stationary tapered guide tip at the writing end of the casing, a feed tube having portions thereof displaced, the displaced portions forming an external groove and internal thread, the feed tube being located within a portion of the casing opening, a rotatable lead holder having one end located within the guide tip and the other end projecting beyond the feed tube, and a manually operable member secured to the projecting end of the lead holder remote from the writing end and in sliding contact with a portion of the casing and adapted to be guided thereby.

18. A mechanical pencil comprising a casing having a longitudinal internally-threaded bore and terminating in a tapered rigid guide tip at the writing end of the pencil, a rotatable member having a slot within the bore, a member having a wing projecting through the slot of the rotatable member and engaging the threads of the bore to move the lead on rotation of the rotatable member.

Signed at New York city in the county of New York and State of New York this 27th day of March, A. D. 1923.

PAUL S. HAUTON.

DISCLAIMER

1,853,560.—*Paul S. Hauton*, Newark, N. J. MECHANICAL PENCIL. Patent dated April 12, 1932. Disclaimer filed November 2, 1935, by the assignee, *Scripto Manufacturing Company*.

Hereby enters this disclaimer to claim 5 of said Letters Patent.

[*Official Gazette November 26, 1935.*]

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17. A mechanical pencil combining a casing having a longitudinal opening, a stationary tapered guide tip at the writing end of the casing, a feed tube having portions thereof displaced, the displaced portions forming an external groove and internal thread, the feed tube being located within a portion of the casing opening, a rotatable lead holder having one end located within the guide tip and the other end projecting beyond the feed tube, and a manually operable member secured to the projecting end of the lead holder remote from the writing end and in sliding contact with a portion of the casing and adapted to be guided thereby.

18. A mechanical pencil comprising a casing having a longitudinal internally-threaded bore and terminating in a tapered rigid guide tip at the writing end of the pencil, a rotatable member having a slot within the bore, a member having a wing projecting through the slot of the rotatable member and engaging the threads of the bore to move the lead on rotation of the rotatable member.

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