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TIP FOR PROPELLING PENCILS

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Fig. 1.

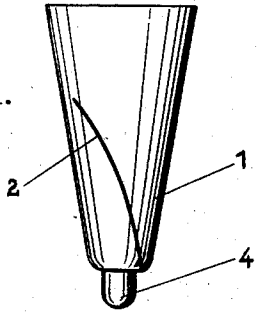


Fig. 2.

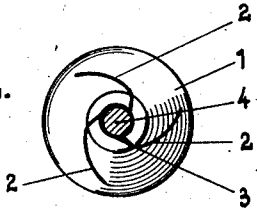


Fig. 3.

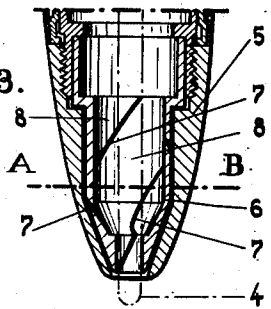


Fig. 4.

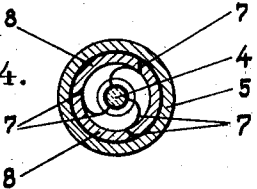
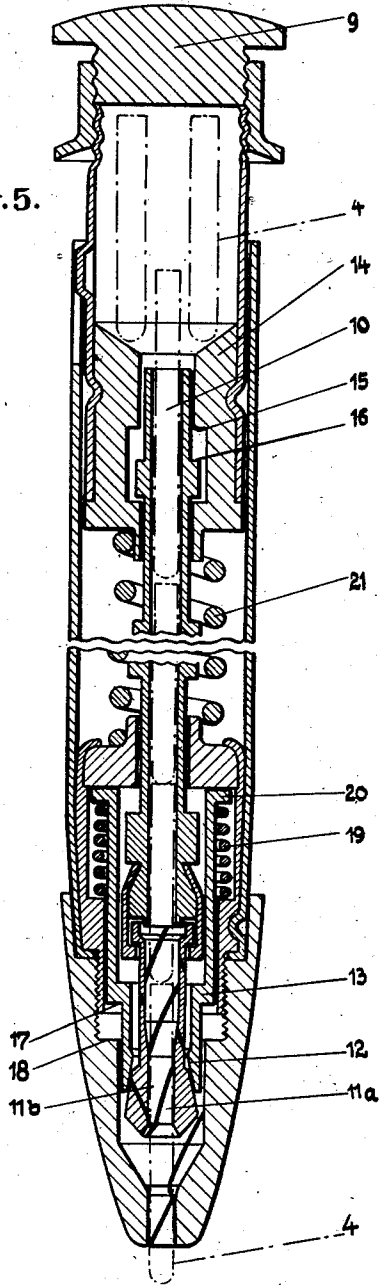


Fig. 5.



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UNITED STATES PATENT OFFICE

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TIP FOR PROPELLING PENCILS

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17 Claims. (Cl. 120—9)

This invention concerns improvements in the lead guiding and engaging parts, and in particular the tip portions of propelling pencils which are operated for example by exerting a pressure on the cap or tip or by rotating the cap or tip of the pencil.

It has already been proposed in such propelling pencils, for the purpose of clamping and propelling the lead, to employ multi-partite clamping devices which consist of a slotted sleeve provided with resilient tongues or of a plurality of freely movable sleeve parts or tong-like members between which the lead is held by means of a clamping ring mounted thereon which presses the resilient or movable members together.

It has also been previously proposed to dispose within the tip cavity of the pencil slotted resilient portions for the purpose of providing a better hold for the lead, and also it has been proposed to provide the tip casing portion of the pencil with slots by which the tip of the pencil was given a resilient construction so that the lead was held more securely.

According to the present invention the slits or incisions with which the lead guiding and engaging parts of propelling pencils are provided, and particularly the tip of the pencil are provided with incisions or slits, the plane of each of which cuts the axis of the particular part at a point. Alternatively, the lead guiding and engaging parts of the pencil may be made up of a plurality of strips of metal wound helically to form in each case a helically slitted tube adapted resiliently to support and grip a lead or leads.

In particular the slits or incisions may be so formed that they appear on the external peripheral surface of the pencil tip and/or on the inner surface of the lead passage as line slits or narrow incisions winding spirally or helically round the lead passage and/or the tip. In cases where the outer surface of the tubular tip of the pencil is slitted in accordance with the invention, and where the outer periphery of the tip is curved in section, the slits or incisions may be in the form of a volute or similar curve.

The slits or incisions will be spaced peripherally around the tip and may advantageously, at or towards their lower ends, i. e. their open ends or those ends nearest the lead opening of the tip, extend tangentially with respect to this opening.

In spite of the spiral or helical course of the slits or incisions on the surface of the slitted part, e. g. of the tip of the pencil casing, the cutting surface itself may be plane, so that the slits or incisions can be formed for example with a saw.

Suitably the incisions when made are very narrow (i. e. their longitudinal walls are substantially in contact) but they may also be closed up as much as possible by a pressure treatment, particularly in the case of the tip of the pencil casing, so that they are only visible on the outer surface of the pencil tip as fine lines or are hardly discernible at all.

The formation of the incisions or slits in the pencil tip according to the present invention, gives the effect that each resilient part of the tip member is overlapped by the neighbouring portions of the latter and is supported in securely holding and guiding the lead against the pressure exerted from within. When the incisions or slots are made sufficiently long, a relatively long portion of the lead is under the action of two or more adjacent resilient holding surfaces so that the lead, which is in this way multiply supported, is completely centralized.

Moreover a particularly effective support against the pressure exerted on the lead when writing can be obtained if tongues which are formed by the slits or incisions in the tip or lead engaging and holding parts of the pencil casing or the strips constituting the latter are made of different breadths, so that narrower tongues are located between broader ones.

In order that the invention may be clearly understood and readily carried into practice, reference will now be made to the accompanying sheet of drawings, in which various constructional embodiments of the invention are illustrated by way of example as applied to a pressure-operated propelling pencil.

Referring to this drawing,

Figure 1 is an elevation of a pencil tip according to the present invention,

Figure 2 is a bottom plan view thereof,

Figure 3 is a sectional elevation of another embodiment of the invention,

Figure 4 is a section taken on line A—B of Figure 3, and

Figure 5 is a sectional elevation of a propelling pencil embodying the present invention.

In the construction shown in Figure 1 the conical tubular tip 1 of the pencil casing is provided with incisions or slits 2 extending partially along the length of this tip and which are visible on the outer surface of the tip, the planes along which these incisions are made being inclined relatively to the axis of the pencil. As may be seen more clearly in Figure 2, which shows the same pencil tip looking from underneath, the slits or incisions 2 run somewhat tangentially to the pe-

riphery 3 of the aperture in the pencil tip. The lead 4 is resiliently held in this aperture.

The pencil tip 1 may be made of any desired material, for example of metal such as German silver and the like.

Figure 3 is a section taken through a pencil tip having a resilient internally arranged member. Within the tip of the pencil casing 5 a separate, resiliently constructed member 6 is disposed, the portion of which directed towards the tip of the pencil is so provided with incisions 7 that a plurality of resilient tongues 8 are formed which mutually support one another, and which uniformly distribute the resilient pressure of the member 6 on the lead 4. Any desired number of slits or incisions may be provided in the tip or in the lead engaging and holding parts, but in general it is preferable to provide at least three slits, particularly in the periphery of the tip.

Figure 5 is a sectional view of a propelling pencil in which both the tip of the pencil casing and the lead-holding and guiding parts disposed in the interior of the tip are provided with slits or incisions formed in accordance with the invention. It is not absolutely essential for the slitted parts to lie entirely within the cavity in the pencil tip; they may alternatively project out of the tip.

In the case of the embodiment shown in Figure 5 the lead 4 is held by a clamping sleeve consisting of a plurality of parts, and a clamping member mounted over this sleeve.

By exerting a pressure on the cap 9 the leads 4 are fed one after the other into the filling tube 10 and at the end of this tube nearest to the tip of the pencil they emerge into the clamping sleeve, which consists of a plurality of separate sleeve portions two of which are indicated at 11a and 11b. In the writing position the conical surface 12 of the clamping ring 13 bears against these sleeve portions so that the lead passage formed by the latter is of slightly less cross sectional area than the lead to be used therein, and the lead is held securely in the writing position by the sleeve portions.

In the construction illustrated by way of example in Figure 5 the lead is propelled by exerting a pressure on the cap 9, whereby the member 14 engages by means of its projection 15 the projection 16 of the filling tube 10 and pushes the latter forward so that the clamping sleeve parts 11a, 11b etc. are pushed towards the tip of the pencil with the frictionally engaged clamping ring 13 together with the lead held thereby. As soon as the clamping ring 13, which is held by the clamping sleeve, strikes with its projection 17 against the projection 18 of the pencil tip, the clamping ring is retained and thus released from the clamping sleeve. The ring 13 is then snapped back into its original position by the spring 19, which presses against the collar 20 of the clamping ring. The clamping sleeve 11a, 11b etc. now releases the lead and the latter is then held merely by the resilient pressure of the slotted pencil tip. If the cap 9 is released the member 14 and with it the filling tube 10 together with the clamping sleeves 11a and 11b which are connected therewith are returned to their initial positions by the action of the spring 21, whilst the lead remains in its position owing to the braking action of the resilient tip. This return movement takes place without the clamping sleeve being able prematurely to refix itself in the clamping ring, because the latter has al-

ready previously been returned to its initial position by the spring 19.

The manner of slitting the clamping sleeve 11a, 11b according to the invention ensures in the holding, guiding and feeding of the lead a particularly uniform distribution of the clamping pressure and a particularly secure holding of the lead, and also ensures that the latter shall be well centralized. Also the portions of the obliquely, spirally or helically slitted surfaces adjacent one another mutually guide and centralize each other.

The subject matter of the present invention can be varied in many ways within the scope of the essential idea upon which the invention is based. For instance it is immaterial whether the tip of the pencil casing is conical or whether it is formed with a curved outer surface. Likewise the number of slots and the material with which the tip portions with the incisions are made can be varied as desired.

What I claim is:—

1. A propelling pencil tip provided with incisions, wherein the plane of each of the incisions cuts the axis of the tip at a point.
2. A tip for a propelling pencil having a plurality of peripherally spaced narrow helical incisions.
3. An externally conical tubular tip for a propelling pencil, such tip having a plurality of incisions extending helically from the smaller end of the tip partially along the length of the tip.
4. An externally conical tubular tip for a propelling pencil, according to claim 3, provided with three helically extending incisions.
5. A tubular tip for a propelling pencil having a conical external form and provided with volute slits extending from its smaller end towards its larger end.
6. A tubular tip according to claim 5, wherein the longitudinal walls are substantially in contact.
7. A tubular tip according to claim 5, wherein the internal diameter of the tip is at one part slightly less than that of the lead for which the pencil is designed.
8. A tip for a propelling pencil provided with incisions which extend helically in relation to the longitudinal axis of the tip of the pencil over part of their length and are substantially tangential to the peripheral edge of the aperture in the pencil tip over the part of their length adjacent their open ends, the lead being resiliently held in said aperture.
9. Means for guiding the lead of a propelling pencil and provided with incisions, wherein the plane of each of the incisions cuts the axis of such guiding means at a point.
10. Lead holding means for a propelling pencil and provided with incisions, wherein the plane of each of the incisions cuts the axis of such holding means at a point.
11. In a propelling pencil a part adapted directly to surround and engage the lead and having a lead passage the cross-sectional area of which is slightly less than that of the lead to be used in the pencil, and said part having one or more spiral slits open at the outer end of said part, and the opposite walls of each slit being substantially in contact, whereby the part is adapted resiliently to grip the lead when disposed therein.
12. A lead engaging part for a propelling pencil and having a lead passage, such part having one or more helically disposed slits each open at one

end and having its longitudinal walls substantially in contact.

5 13. A tubular member for a propelling pencil and adapted resiliently to grip a lead passed therethrough, such member being provided with helical slits having their longitudinal walls substantially contacting, and such slits being spaced around the tubular member to provide resilient tongues of different widths.

10 14. In a propelling pencil, an externally conical tip and a lead engaging part having a lead passage, such part having one or more helically disposed slits each open at one end and having its longitudinal walls substantially in contact.

15 15. A tip for a propelling pencil the wall of which is slitted, the plane of slitting cutting the axis of the tip at a point.

16. An externally conical tip for a propelling

pencil having in its wall longitudinal spiral line slits extending completely through the thickness of the wall, the slits being open ended at the smaller extremity of the tip.

17. A propelling pencil having a tip provided 5 with spiral slits in its walls and extending from the inside to the outside thereof, and such tip including therewithin a lead engaging part having a passage therethrough for the lead, said passage being of less cross-sectional area than the 10 lead to be used in the pencil, and said lead engaging part also being provided with one or more spiral slits, the opposite walls of the slits in the walls of said tip and in said lead engaging part being substantially in contact and these slits 15 all being open at the lead emerging end thereof.

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