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Girella

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[54] **REFILLABLE PENCIL**

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[51] **Int. Cl.** **B43k 21/16**

[58] **Field of Search** 401/65–67, 401/88–95

[56] **References Cited**

UNITED STATES PATENTS

2,243,109	5/1941	Lynn	401/65
2,473,149	6/1949	Juelss	401/65
2,496,554	2/1950	Lynn	401/65

FOREIGN PATENTS OR APPLICATIONS

601,868	2/1960	Italy	401/93

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[57] **ABSTRACT**

A refillable pencil comprising among various structural components a lead braking clamp forming an integral portion of a hollow body member of injected plastic material and a lead locking clamp forming an integral portion of a tubular member of injected plastic material slidingly disposed in said hollow body member, whereby the construction of the pencil is simplified and its manufacturing costs are reduced.

2 Claims, 4 Drawing Figures

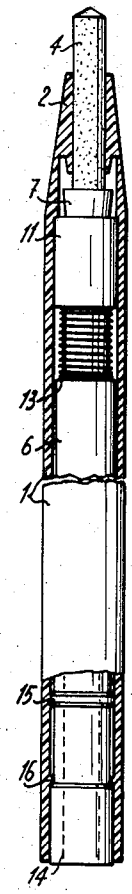
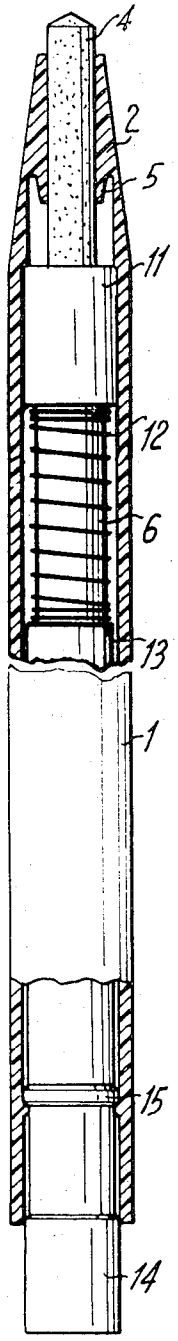


FIG. 1



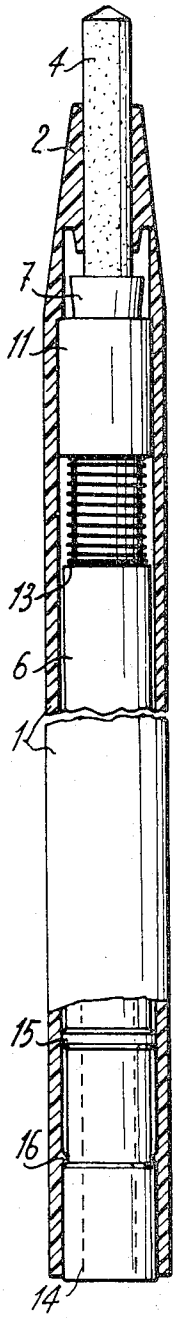


FIG. 2

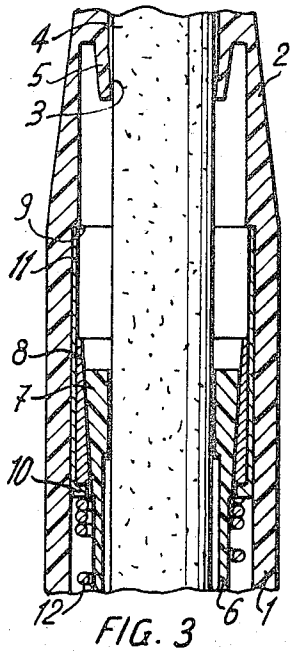
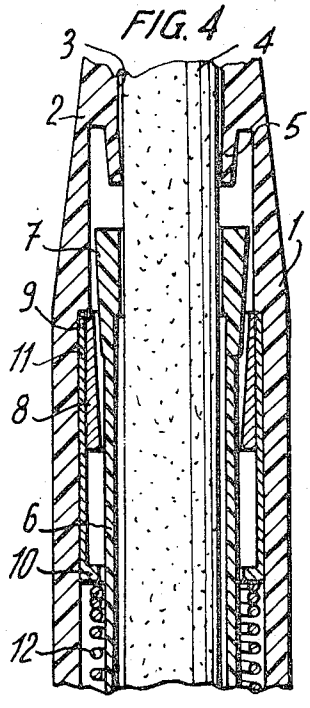


FIG. 3

FIG. 4



REFILLABLE PENCIL

BACKGROUND OF THE INVENTION

The present invention relates to refillable pencils and more particularly to an improved refillable pencil of simplified construction, which can be manufactured at low cost.

Known refillable pencils comprise a hollow body member, a tubular membe slidingly disposed in said hollow body member for receiving a lead, said tubular member comprising at one of its ends a clamp for releasably locking said lead and at its other end a push button projecting from said hollow body member, for allowing a user to displace said sliding tubular member against the biasing action of a compressible spring, an annular member of wedge shaped longitudinal section being disposed, between said locking clamp and the inner surface of a wall portion of said hollow body member, for displacement between two stop means disposed fixedly relative to said hollow body member, whereby to allow said locking clamp to be tightened and said sliding tubular member to be simultaneously locked, against the biasing action of said compressible spring, when said annular member engages one of said stop means and to allow said locking clamp to be released, when said annular member engages the other one of said stop means, said hollow body member comprising a frictional clamp for braking said lead.

However, the prior art refillable pencils are not satisfactory because their construction is complicated and their manufacturing costs are high.

Now it has been proved possible to obviate the drawbacks of the prior art pencils by providing a refillable pencil, the locking and braking clamps of which form integral portions of other structural parts of the pencil.

SUMMARY OF THE INVENTION

It is therefore a general object of the invention to provide a refillable pencil having an improved structure which overcomes the drawbacks of prior art pencils of this type and which is simple and inexpensive.

A principal object of the present invention is to provide a refillable pencil comprising a hollow body member, a tubular member slidingly disposed in said hollow body member for receiving a lead, a clamp means for releaseably locking said lead, a means for allowing a user to actuate said tubular member against an resilient biasing means to operate said locking clamp means and a clamp means for frictionally braking said lead, the locking clamp forming an integral portion of said tubular member and/or the braking clamp forming an integral portion of said hollow body member.

Another object of the invention is to provide a refillable pencil, wherein said sliding tubular member and said hollow body member are made of injected plastic material.

A further object of the invention is to provide a refillable pencil, wherein said sliding tubular member defines a passage, which is open at both ends, whereby to allow the introducing of the lead at the rear end or at the front end of the pencil.

A still further object of the invention is to provide a refillable pencil, wherein the inner surface of a wall portion of said hollow body member comprises an annular rib cooperating with an annular rib of the outer surface of a wall portion of said sliding tubular member, whereby to retain said sliding tubular member against the biasing action of said resilient means, when there is no lead in the pencil.

Still another object of the invention is to provide a refillable pencil, wherein said clamp of said sliding tubular member has roughened surfaces for enhancing its frictional force on said lead.

Various other more detailed objects, features and advantages of the invention, such as arise in connection with carrying out the invention in practical embodiments, will be in part obvious, and in part be stated in the following description.

BRIEF DESCRIPTION OF THE DRAWING

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawing, in which:

FIG. 1 is a fragmentary side elevation view, partially sectioned, showing a refillable pencil in accordance with the invention in its writing position;

FIG. 2 is a view similar to that of FIG. 1, showing the various structural parts of the refillable pencil in their respective positions at the end of a manipulation for advancing a lead, and

FIGS. 3 and 4 are enlarged fragmentary sectional views showing portions of FIGS. 1 and 2 respectively.

DESCRIPTION OF SPECIFIC EMBODIMENTS

It should, of course, be understood that the description and drawing herein are illustrative only, and that various modifications and changes can be made in the structure disclosed without departing from the spirit of the invention.

Similar reference numerals refer to similar parts throughout the views.

The refillable pencil shown in FIGS. 1 to 4 of the accompanying drawing comprises a hollow body 1 made of injected plastic material, an end 2 of which is provided with a bore 3 for guiding a lead 4. The bore 3 extends in the direction of the interior of the hollow body 1. At the inner end of the bore 3 the hollow body 1 is provided with small tongues 5 forming integral portions thereof and constituting a clamp for braking the lead 4, the brakng action being obtained by means of the elastic friction of the tongues 5 on the lead 4.

In the inner space of the hollow body 1 is slidingly disposed a tubular member 6, an end of which is split in form of small tongues 7 constituting a clamp 7 for releaseably locking the lead 4. The tongues 7 are surrounded by an annular member 8 having a wedge shaped longitudinal section and which is disposed for sliding movement between a stop means formed by an annular shoulder 9 of the inner surface of a wall portion of the hollow body 1 and another stop means formed by a rim 10 of a sleeve 11 disposed in the hollow body 1.

The rim 10 of the sleeve 11 also supports one of the ends of a helical spring 12 surrounding the sliding tubular member 6, the other end of the spring 12 being supported by a shoulder 13 of the member 6.

The sliding tubular member 6 extends substantially over the whole length of the hollow body 1 and forms at the rear end of the body 1 a projection constituting a pushbutton 14 to be pressed by the user of the refill-

able pencil, for moving the lead 4 out of the pencil. At the rear end of the pencil, the sliding tubular member 6 is provided on its outer wall surface with an annular rib 15 disposed for cooperation with an annular rib 16 located on the inner wall surface of the hollow body 1.

The sliding tubular member 6 as well as the hollow body 1 being made of injected plastic material, the inherent elasticity of the hollow body 1 and of the member 6 allow the mounting of the refillable pencil by introducing the member 6 through the open rear end of the body 1 and by exerting, on the member 6, a pressure sufficient to cause said annular ribs 15 and 16 to pass over each other and to come in the position shown in FIG. 1.

The sliding tubular member 6 is open at both ends, thus allowing the lead 4 to be introduced in the pencil at the front end or at the rear end of this pencil.

When the structural parts of the refillable pencil are in the position shown in FIG. 1, the spring 12 urges the tubular member 6 in its rear position and the annular member 8 presses the tongues 7 of the locking clamp 7 against the lead 4, the sloping outer surfaces of the small tongues 7 cooperating with the associated truncated cone shaped inner surface of the annular member 8. The structural parts of the refillable pencil are during writing in the position shown in FIG. 1.

For feeding or advancing the lead the user may press on the push-button 14 for displacing the sliding 6 against the force of the opposing spring 12. The small angle defining the conical form of the inner surface of the annular member 8 causes a self-blocking to occur between the inner surface of the member 8 and the tongues 7 in a manner that, at the beginning of the displacement, the annular member 8 and the tongues 7 are displaced in an interlocked relationship, the pressure exerted by the tongues 7 on the lead 4 being maintained. Accordingly, the lead 4 advances together with the tubular member 6 until the annular member 8 engages the stop shoulder 9. Then the continuation of the advancing movement of the tubular member 6 causes the tongues 7 to be released from the annular member 8, the locking action of the tongues 7 on the lead 4 being suppressed, as illustrated in FIGS. 2 and 4.

When the user releases the push-button 14, the spring 12 returns the sliding tubular member 6 in its position shown in FIG. 3, the sliding annular member 8 being pulled rearward by the tubular member 6. Upon engagement of the member 8 with the rim 10, the tongues 7 wedge themselves in between the member 8 and the lead 4, whereby the lead 4 is locked. During the return movement of the tubular member 6, the lead 4 remains immobile owing to the braking action of the tongues 5.

For enhancing the frictional locking force between the locking clamp 7 and the lead 4, small grooves or projections may, of course, be provided on surfaces of the tongues 7, which cooperate with the lead 4.

While certain preferred embodiments of the invention have been illustrated by way of example in the drawing and particularly described, it will be understood that various modifications may be made in construction and that the invention is in no way limited to the embodiments shown. Since certain changes may be made in the above described embodiments without departing from the scope of the invention, it is intended that all matter contained in the above description, or shown in the accompanying drawing shall be interpreted as illustrative, rather than in a limiting sense.

I claim:

1. A mechanical lead pencil comprising a hollow body including a bored lead receiving end, return spring within said body, a sliding tubular lead holding member within said body and having a portion thereof surrounded by said spring, said body and said lead holding member both made of plastic material possessing limited resilience, said lead holding member including at one end a plurality of clamping tongues to clamp the lead and at the opposite end a pushbutton projecting out of the end of said body opposite said lead receiving end to permit the user to move the sliding lead holding member against the action of said return spring, a wedge shaped annular member disposed between said tongues and the inner wall of said hollow body, first and second stop means above and below said annular member, the engagement of said annular member with said second stop means ensuring the clamping of said tongues and simultaneously locking said lead holding member against the action of said spring, the engagement of said annular member with said first stop means ensuring the release of said tongues, braking tongues in said hollow body exerting friction against said lead, the inner wall of said hollow body provided with an annular rib, the outer wall of said sliding lead holding member also provided with an annular rib so as to keep said sliding member in place against the action of said spring in the absence of a lead in said pencil, said lead holding member being integral with said clamping tongues, said push button also integral with said lead holding member, said lead holding member being of reduced outer diameter near said clamping tongues and including a shoulder separating the reduced diameter portion from the larger portion, said spring having one of its ends abutting said shoulder, the opposite end of said spring abutting said second stop means, whereby, when lead is removed from said sliding member said sliding member and spring may be withdrawn completely from said body by axially pulling said push-button away from said body to force said sliding member rib to pass said body rib.

2. A mechanical lead pencil as claimed in claim 1 wherein said sliding tubular lead holding member has a longitudinally extending bore throughout its length and is open at both ends.

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