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Description

BACKGROUND OF THE INVENTION

The present invention relates to mechanical pencil in which an eraser can be drawn out from a rear end of a tubular cap by turning the tubular cap and a lead can be drawn out from a head member.

The present invention relates to eraser holder of drawing-out type in which by turning of a tubular cap against a tubular body an eraser holder can be slid so that the eraser held by two holding pieces can be drawn out according to the turning direction.

Furthermore, the present invention relates to mechanical pencil in which a stick-shaped object such as eraser, lead crayon, creyon pastel, chalk, rouge, eyebrow pencil lead can be drawn out of the rear end of the tubular body while lead can be drawn of the head member.

The usual mechanical pencil is constructed so that an eraser can be used by removing a knock cap from an eraser holder put on a lead tank of a writing shaft and a lead can be drawn out from a head member by knocking the knock cap attached on the eraser holder when the eraser is not used.

However, in the usual instance, because the eraser cannot be drawn out, whenever the eraser was worn out, troublesome work was necessitated in which an eraser supporter was taken out from the eraser holder; the eraser supporter was opened, the eraser was drawn out to the amount of worn out eraser, and thereafter the eraser supporter was inserted in the eraser holder and set therein by closing the eraser holder.

Further, the mechanical pencil has an eraser holder in which an eraser supporter in which an eraser is held with being pressed thereon is attachably and detachably inserted in an eraser holding tubular part.

However, in the usual instance, whenever eraser is worn out, troublesome work was necessitated in which an eraser supporter was taken out from the eraser holder tubular part, the eraser supporter is opened, the eraser was drawn out to the amount of worn out eraser, and thereafter the eraser supporter was inserted in the eraser holding tubular part and set by closing the eraser supporter.

There is known a pencil having an eraser feeding mechanism (see US-A-2 198 335) in which an eraser can be drawn out from the rear end of the pencil by turning a cap in respect to the barrel of the pencil. This type of eraser feeding mechanism shows several disadvantages. Form closure between eraser and cap with respect to turning movement is necessary to allow axial movement of the eraser. However such kind of form closure is difficult to obtain when using elastic parts as an eraser. A second disadvantage results from the fact that the cap has to be fitted over the upper end of the main barrel of the pencil so as to turn on the latter. By this axial movement of the cap with respect to the barrel cannot be avoided causing the cap to glide off the barrel.

In an other embodiment according to US-A-2 198 335 there is provided an inner sleeve having a flange part which rests on the upper end portion of the barrel avoiding axial movement of the latter. By this the above mentioned problem is still not solved since the lower end of the inner sleeve now has to be secured against axial movement with respect to the pencil barrel. This is done by friction. As is to be seen mere friction is still not appropriate to prevent two tubular parts from axial gliding movement.

BRIEF SUMMARY OF THE INVENTION

It is the primary object of this invention to provide writing tool wherein a writing shaft having a head member is inserted in an outer sleeve in such a manner that the head member is projected from the outer sleeve, a lead tank of the writing shaft has the structure that said lead tank is movable in the axial direction and can be locked in the turning direction against an outer surface of the outer sleeve, a tubular cap is provided with a tubular part which is engaged with the lead tank so as to be rotatable and able to be attached and detached, a spiral groove is formed on an inner surface of the tubular cap, a projecting part of an eraser holder holding eraser is engaged with the spiral groove, and that said eraser holder is provided with a tubular body which is rotatable in the axial direction and can be locked in the turning direction against a rear part of the lead part.

According to such a construction, because the tubular body of the eraser holder is movable in the axial direction and locked in the turning direction, turning of the tubular cap makes the eraser holder the projecting part of which is engaged with the spiral groove move along the spiral groove of the tubular cap turned in the axial direction so that the eraser can be drawn out from a rear end of the tubular cap or drawn therein according to the turning direction.

It is a further object of this invention to provide writing tool with an eraser holder wherein an annular projection and spiral groove are provided on a tubular cap, a slit is formed in a tubular body having a retaining part which is engaged with the annular projection, a holding piece of an eraser holder is slidably inserted in the slit so that the holding piece is directed rearward, an eraser is held with the holding piece, and a projection which
is provided on the holding piece is engaged with the spiral groove of the tubular cap.

Because the projections provided on the holding pieces is inserted in the spiral groove of the tubular cap, turning the tubular cap against the tubular body makes the eraser holder travel in the axial direction with being guided along the slit of the tubular body in which the holding pieces is inserted so that the eraser can be drawn out and in of the tubular body according to the turning direction.

It is a further object of this invention to provide writing tool wherein a writing shaft having a head member is inserted in an outer sleeve in such a manner that the head member is projected from the outer sleeve, a annular projection and spiral groove are provided on the forward inner surface and the rearward inner surface of a tubular cap, respectively, a retaining part which is engaged with said tubular projection is provided on an outer surface of a tubular body, a bearing part which is brought into contact with a lead tank is provided inside a part of the tubular part which is positioned forward of said retaining part so that the forward part is movable in the axial direction and is locked in the turning direction against the rearward inner surface of the outer sleeve, a slit is provided on the rear part of the tubular body, an eraser holder is slidably inserted in said slit.

According to such a construction, when the tubular cap is turned, because the forward part of the tubular body is movable in the axial direction and is locked in the turning direction against the rearward part of the outer sleeve, and also because the eraser holder is slidably inserted into the slit of the rearward part of the tubular body, the eraser holder can be moved in the axial direction with being guided along the slit of the tubular body so that the eraser provided on the eraser holder can be drawn in and out of the tubular body.

**DRAWINGS**

In the drawings,

Figure 1 is a vertical section showing an example of eraser holder according to the present invention;

Figure 2 is a partial exploded view of Figure 1;

Figure 3 is a sectional view showing a state that an eraser holder in which an eraser is held is inserted into a slit of a tubular body according, to the invention.

**DETAILED DESCRIPTION**

An example according to the present device is illustrated with reference to Figure 1 to 3 as under.

Numeral 101 designates a tubular cap. On the forward inner surface an annular projection 102 is provided, while on the rearward inner surface a spiral groove 103 is provided. Numeral 105 is a tubular body inserted from the rear end of the tubular cap 101. The outer surface of a nearly central part of the tubular body 105 has a retaining part 104 which is engaged with an annular projection 102 while a opposing part of the rearward part of the tubular body 105 is provided with a slit 106. The retaining part 104 is formed of a projecting pieces 111 formed by cutting and a stair 112 of the tubular body 105.

Two holding pieces 108 of the eraser holder 107 are slidably inserted in the slit 106 so as to be directed backward. Between the both holding pieces 108 the eraser 109 is held. Numerals 113, 114 designate annular stoppers of the eraser holder 107 formed in the forward and rear ends of the slit 106, respectively. Accordingly, the eraser holder 107 can be moved in the axial direction till the eraser holder 107 comes into contact with the annular stoppers 113, 114 at the forward and rear ends of the slit 106. Further, the spiral groove 103 of the tubular cap 101 is engaged with the projections 110 provided on the holding pieces 108.

A method of assembling the eraser holder of the drawing-out system according to the device having the above-mentioned construction is illustrated as under.

First, as both sides of the slit of the tubular body 105 are bent toward the outside, eraser holder 107 is inserted from the so as to be directed backward, and said both holding pieces 108 are slidably inserted in both slits 106. Then, the eraser 109 is inserted from the rear end of the tubular body 105 so as to be held to said both holding pieces, the tubular body 105 is inserted from the rear end of the tubular cap 101 whereby the projecting pieces 111 being bent inward get over the annular projection 102 of the tubular cap 101 and thereafter the annular projection 102 is inserted in the retaining part 104 formed between the projecting pieces 111 and the stair 112, and assembling end.

Holding of the eraser 109 with both holding pieces 108 may be carried out after the tubular body 105 is attached to the tubular cap 101. When the assembling has ended, the annular stopper 114 comes into contact with the rear end of the tubular cap 101. It does not need to say that sizes of parts should be determined so that the above state is obtained.

Then, function of the eraser holder accordingly to the device is illustrated. When the eraser 109 is not used, as shown in Figure 2, the eraser 109 comes into contact with the annular stopper 113 of the forward part of the eraser holder 107; and the
top of the eraser 109 just coincides with the end surface of the annular stopper 114 on the rear part of the tubular body 105.

Under this condition, because the projections 110 provided on the holding pieces 108 of the eraser holder is inserted in the spiral grooves 103 of the tubular cap 101, turning of the tubular cap 101 against the tubular body 105 makes the eraser holder 107 move in the axial direction as the eraser holder 107 is guided along both slits 106 of the tubular body with which both holding pieces 108 is engaged so that the eraser holder 109 held by two holding pieces of the eraser holder 107 can be drawn out and in of the tubular body according to the turning direction.

Drawing-out of the eraser 109 can be performed by turning the tubular cap 101 to the amounts of worn out eraser so that the eraser holder 107 can be moved in the axial direction, on the right direction. After the eraser has been used, reverse-turning of the tubular cap 101 makes the eraser holder 107 move left by which the eraser can be drawn in.

Further, because the eraser 109 is held by two holding pieces 108 of the eraser holder 107 which is inserted in the tubular body 105 on the side of slits and the holding pieces 108 is slidably engaged with the slits 106, the eraser 109 is held by two holding pieces 108 and parts of the tubular body 105 on the two sides of slits. Therefore the eraser 109 cannot be unsteady during erasing. Besides, as the whole part of the eraser 109 can be formed to the same diameter, there is no need to thin a part of the eraser brought into contact with the holding part. Further, because the eraser 109 with much the same size as the inner diameter of the part of the slit side tubular body 105 can be used, there is no need to make thicker scale of the tubular cap 101. Therefore the eraser can be used to the maximum thickness.

In case of the eraser holder according to the device being applied to the mechanical pencil, the forward part of the tubular body 105 is made thinner than the rearward part on the slit, a bearing plate 116 which is brought into contact with the rearend of the lead tank 115 is provided on the forward inner surface, and the polygonal part 119 which is inserted in the polygonal part 118 formed on the inner surface of the outer sleeve 117 is formed on the forward outer surface of the tubular body 105.

In such a construction, because the polygonal part 119 of the forward outer surface of the tubular body 105 is inserted in the polygonal part 118 forward on the inner surface of the outer sleeve 117, the tubular body 105 is movable in the axial direction and is locked in the turning direction, and further because the lead tank 115 is brought into contact with the bearing plate 116, the tubular body 105, tubular cap 101 attached thereto is moved forward or rearward against the spring or with the spring force in the same manner as the known mechanical pencil so that the lead can be drawn out from the head member of the mechanical pencil with the opening and the shutting of the chuck. Further when the tubular cap 101 is turned, taking in and out of the eraser 109 can be carried out.

As the above-mentioned, according to the device, the eraser holder 107 can be moved in the axial direction with the tubular cap 101 being turned against the tubular body 105 so that the eraser can be drawn in and out of the tubular body 105. Therefore erasing can be performed by drawing out the eraser 109 with the necessitated amount while when the eraser is not used the eraser can be drawn in, thus taking in and out being able simply to be performed sorely with turning operation. Therefore it does not need repeatedly to do troublesome work as in the usual instance.

Claims

1. Writing tool with an stick-shaped object holder of drawing-out type comprising a tubular cap (101) having a spiral groove (103) on its interior surface, a tubular body (105), a holding piece (108) of a stick-shaped object holder (107), said holding piece (108) being directed rearward, a stick-shaped object, preferably an eraser (109), held by the holding piece (108), said holding piece (108) having a projection (110) being engaged with the spiral groove (103) of the tubular cap (101), whereby rotation of said tubular cap (101) in respect to said tubular body (105) extends or retracts said stick-shaped object (109) held by holding piece (108) of stick-shaped object holder (107), said tubular body (105) having a slit (106) formed therein and said stick-shaped object holder (107) slidably being inserted in said slit (106), characterized by an annular projection (102) formed on the interior surface of said tubular cap (101), said annular projection (102) being engaged with a retaining part (104) formed on the tubular body (105).

2. Writing tool according to claim 1, characterized in that retaining part (104) is formed by a projecting piece (111) formed by cutting on the outer surface of the tubular body (105) and a stair (112) of the tubular body (105).

3. Writing tool according to claim 1 or 2, characterized in that an annular stopper means
(114) on the rear-end of the tubular body (105) is in contact with the rear-end of tubular cap (101).

4. Writing tool according to any of claims 1 to 3, characterized in that holding piece (108) is slidably engaged with the slit (106) so that slit (106) is filled by holding piece (108) over the length of holding piece (108) and that projection (110) formed on the outer surface of holding piece (108) engages with spiral groove (103) only.

5. Writing tool according to any of claims 1 to 4, characterized by annular stopper means (113, 114) provided on the tubular body (105) at both ends of the slit (106) respectively.

**Patentansprüche**

1. Schreibgerät mit einem Halter für einen stabbförmigen Gegenstand zum Herausschieben mit einer rohrförmigen Kappe (101), die an ihrer Innenseite eine Spiralnut (103) aufweist, einem rohrförmigen Körper (105), einem Halte teil (108) eines Halter (107) für einen stabbförmigen Gegenstand, wobei besagtes Halte teil (108) zum hinteren Ende des Schreibgeräts weist, einem stabförmigen Gegenstand, vorzugsweise einem Radierer (109), der vom Halte teil (108) gehalten wird, wobei besagter Halte teil (108) einen Vorsprung (110) aufweist, der mit der Spiralnut (103) der rohrförmigen Kappe (101) in Eingriff steht, wobei eine Drehung besagter rohrförmiger Kappe (101) in Bezug zu besagtem rohrförmigem Körper (105) den vom Halte teil (108) des Halter (107) gehaltenen stabförmigen Gegenstand (109) ausführt oder einfärbt, wobei besagter rohrförmiger Körper (105) einen in ihm gebildeten Schlitz (106) aufweist, in welchem der Halter (107) für den stabförmigen Gegenstand verschiebbar eingesetzt ist, gekennzeichnet durch einen an der inneren Oberfläche besagter rohrförmiger Kappe (101) gebildeten ringförmigen Vorsprung (102), der mit einem am rohrförmigen Körper (105) gebildeten Rückhalte teil (104) in Eingriff steht.

2. Schreibgerät nach Anspruch 1, dadurch gekennzeichnet, daß der Rückhalte teil (104) durch einen mittels Schneiden in der äußeren Oberfläche des rohrförmigen Körpers (105) hergestellten Vorsprung (111) und eine Stufe (112) des rohrförmigen Körpers (105) gebildet wird.

3. Schreibgerät nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß ein ringförmiger Stopper (114) am hinteren Ende des rohrförmigen Körpers (105) in Kontakt mit dem hinteren Ende der rohrförmigen Kappe (101) ist.

4. Schreibgerät nach einem der Ansprüche 1 bis 3, dadurch gekennzeichnet, daß der Halte teil (108) verschiebbar im Schlitz (106) angeordnet ist, so daß der Schlitz (106) über die Länge des Halte teils (108) von diesem ausgeführt ist und daß der an der Oberfläche des Halte teils (108) ausgebildete Vorsprung (110) ausschließlich mit der Spiralnut (103) in Eingriff steht.

5. Schreibgerät nach einem der Ansprüche 1 bis 4, dadurch gekennzeichnet, daß die ringförmigen Stopper (113, 114) entsprechend an beiden Enden des Schlitzes (106) am rohrförmigen Körper (105) vorgesehen sind.

**Revendications**

1. Dispositif pour écrire ayant un support d’objet en forme de bâton du type extracteur comportant un capuchon tubulaire (101) ayant une gorge en spirale (103) située sur sa surface intérieure, un corps tubulaire (105), une partie de support (108) d’un dispositif de support (107) d’objet en forme de bâton, ladite partie de support (108) étant dirigée vers l’arrière, un objet en forme de bâton, de préférence une gomme (109), maintenue par la partie de support (108), ladite partie de support (108) ayant une saillie (110) étant en prise dans la gorge en spirale (103) du capuchon tubulaire (101), de sorte que la rotation du capuchon tubulaire (101) par rapport audit corps tubulaire (105) étend ou rétracte ledit objet en forme de bâton (109) maintenu par la partie de support (108) du dispositif de support (107) d’objet en forme de bâton, ledit corps tubulaire (105) ayant une fente (106) formée dans celui-ci et ledit dispositif de support (107) d’objet en forme de bâton étant inséré de manière coulissante dans ladite fente (106), caractérisé par une saillie annulaire (102) formée sur la surface intérieure dudit capuchon tubulaire (101), ladite saillie annulaire (102) étant en contact avec une partie de retenue (104) formée sur le corps tubulaire (105).

2. Dispositif pour écrire selon la revendication 1, caractérisé en ce que la partie de retenue (104) est formée d’une partie en saillie (111) formée par découpe de la surface extérieure
du corps tubulaire (105) et un épalement (112) du corps tubulaire (105).

3. Dispositif pour écrire selon la revendication 1 ou 2, caractérisé en ce que des moyens d’arrêt annulaires (104) situés sur l’extrémité arrière du corps tubulaire (105) sont en contact avec l’extrémité arrière du capuchon tubulaire (101).

4. Dispositif pour écrire selon l’une quelconque des revendications 1 à 3, caractérisé en ce que la partie de support (108) est en prise de manière coulissante avec la fente (106) de telle sorte que la fente (106) est remplie par la partie de support (108) sur la longueur de la partie de support (108) et que la saillie (110) formée sur la surface extérieure de la partie de support (108) est en prise avec la gorge en spirale (103) seulement.

5. Dispositif pour écrire selon l’une quelconque des revendications 1 à 4, caractérisé en ce que des moyens d’arrêt annulaires (113, 114) sont prévus sur le corps tubulaire (105) aux deux extrémités de la fente (106) respectivement.