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MECHANICAL PENCIL

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This invention relates to mechanical pencils and has for one of its objects the provision of a pencil of this character having a compartmented outer casing, housing or magazine for storing a plurality of leads of diverse hardness or color, together with means for selecting any of the aforesaid leads and positioning same for use.

Another object of the invention is the provision of such a pencil having means for guiding the lead into writing position in a slotted central tube, means for gripping same, and means for guiding the lead back into its compartment when the lead is released.

A further object of the invention is the provision of means for blocking the slot in the central tube when occupied by a lead to facilitate the selection of the leads without breakage and to prevent any of the other leads from trying to enter the central tube when so occupied.

Another object is to produce a device of the character described in which the maximum simplicity of construction and operation is secured.

Other objects and advantages will appear as the nature of the improvements is better understood, the invention consisting substantially in the novel arrangement and co-relation of parts herein fully described and illustrated in the accompanying drawing, wherein similar reference characters are used to describe corresponding parts throughout the several views, and then finally pointed out and specifically defined and indicated in the appended claims.

The disclosure made the basis of exemplifying the present inventive concept suggests a practical embodiment thereof, but the invention is not to be restricted to the exact details of this disclosure, and the latter, therefore, is to be understood from an illustrative, rather than a restrictive standpoint.

The inventive idea involved is capable of receiving a variety of mechanical expressions, one of which, for the purpose of illustration, is shown in the accompanying drawing, in which—

Figure 1 is a longitudinal sectional view through a pencil embodying my improvements;

Fig. 2 is a fragmental sectional view taken on line 2—2, Fig. 1;

Fig. 3 is a fragmental side elevation of the central or selector tube also showing the blocking tube therein;

Fig. 4 is a disassembled perspective view of the pencil;

Fig. 5 is a cross-sectional view taken on line 5—5 Fig. 1;

Fig. 6 is a perspective view of the selector tube;

Fig. 7 is a perspective view of the blocking tube; and

Fig. 8 is a perspective view of the pencil grade indicating collar.

Referring now to the drawing in detail, 10 indicates an outer housing, casing, or magazine, having a plurality of longitudinally extending grooves or compartments 11 for housing or storing lengths or sticks of lead 12. Fitting into the upper end of the housing 12 is a cylinder 13 provided with an annular shoulder or flange 14 upon which rests a collar 15, the outer surface of which is covered by a transparent collar 16. The said collar 16 is in frictional engagement with the collar 15 and is removable therefrom, the collar 15 having a tight fit with respect to the cylinder 13.

Centrally located within the large bore 13a of the cylinder 13 is a detent or clutch member 17 having a central bore 18, the said clutch member 17 being held against rotation by means of a pin 19 which extends into a hole 20 in the bottom fluted wall 21 of the cylinder 13. A selecting tube 22 extends upwardly from the housing 10 into the cylinder 13 through a bore 23 smaller in diameter than the bore 13a, the said tube also passes through the bore 18 in the clutch member 17. Slidably mounted upon the upper end of the tube 22 and superposed over the clutch member 17 is a second clutch member 24 having a tongue 25 which extends inwardly through a slot 26 in the tube 22 into engagement with a spiral groove 27 in a stud 28. The said stud is provided at its upper end with a reduced portion 29 which fits rotatably in a bearing washer 30 driven or soldered into the selector tube 22. The stud 28 is further provided with a lower reduced portion 31 which is driven into the upper end of a blocking tube 32 which is rotatable within the selector tube 22.

A shell or cap 33 is provided at the top of the pencil and has secured thereto a tubular member 34 having a cross slot 35 to straddle a pin 36 driven through a pair of oppositely disposed holes 37 in the upper end of the tube 22, the said pin acting as a stop for a washer 38 against which the upper end of a spiral compression spring 39, the lower end of the said spring exerting a tension against the clutch member 24 to maintain the said clutch member in operative engagement with the clutch member 17.

Secured to the bottom of tube 22 is a slotted gripping member 40 which due to the upward

tension of the spring 39 is drawn against the conical bore 41 of the sleeve 42 rotatably mounted at the bottom of the housing 10.

The bottom of the said housing 10 has a downwardly tapering opening 43 into which is sprung the upwardly flaring projection 44 of the sleeve 42, thus providing a rotatable joint which cannot come apart.

The selecting tube 22 is provided with a longitudinal slot 45 to permit passage of the leads 12 into and out of the said tube, and the tube 32 is also provided with a longitudinal slot or cutout 46 having one longitudinal edge 47 parallel to the edges of the slot 45, the other edge 48 being only parallel to the slot 47 for a portion of its length, the balance 49 thereof tapering downwardly to within a short distance of the bottom of the tube.

The operation of the device in loading the pencil, is as follows:

First, the cap 33 is rotated, until the pointer or arrow-like configuration 50 is brought into alignment with a graduation or line 51 on the collar 15 in the center of the area bearing the color or degree of hardness corresponding to the color or hardness of the lead to be inserted. The pencil is then grasped in one hand and inverted and pressure is applied to the cap 33 with the thumb causing vertical sliding movement between the housing 10 and lower sleeve 42 with respect to the cap 33 to release the grip 40 to permit the springlike jaws of the said grip to open up to permit of the insertion of the lead. Simultaneously with the said action, the tongue 25 of the clutch member 24 through its engagement with the groove 27 in the stud 28 which is secured in the upper end of the tube 32 rotates same to bring the slot 46 therein into alignment with the slot 45 to permit the lead to pass out of the said tubes. In its downward movement the leading end of the lead will strike the bevelled or tapered end 53 of a plug 54 to guide the said lead into its intended groove 11 in the housing, the initial rotation of the cap 33 having brought the slot 45 into alignment with said groove. Upon the release of the cap 33 the tube 32 will be rotated back again into its normal position by the action of the cam groove 27 and clutch tongue 25. During the said return movement of the tube 42, the tapering edge 49 will tend to aid in rolling the lead out of the tubes into the magazine groove. This action is repeated until the magazine is fully loaded.

To select the lead desired for use the cap 33 is rotated so that the pointer 50 is in line with the required line 51 on the sleeve 15 to bring the slot 45 into alignment with the magazine groove 11 in which the said lead is housed. During the above rotary movement of the cap 33, the tube 22 which is carried thereby will also rotate and carry with it the clutch member 24 which will ride up and down upon the tube 22 against the tension of the spring 39. With the cap 33 in adjusted position, it is pressed downwardly to bring the slot 46 into alignment with the slot 45, so that the pencil 12 may slide off the inclined surface 55 of the housing upon which it rests, into the interior of the tube 32 to be gripped by the jaws of the gripper 40, said jaws being opened by the pressure exerted upon the cap.

From the foregoing it will be seen that I have provided a simple yet efficient selective mechanical pencil adapted for use by draughtsmen, artists, bookkeepers and the like, the said pencil

having a magazine or housing for compactly storing a plurality of leads of various colors and degrees of hardness which may be selected for use as desired by a simple rotating and pressure applying operation.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A pencil of the nature described comprising a housing having a plurality of longitudinal lead storing grooves, a longitudinal rotatable tube centrally located with respect to the grooves, the said tube having a longitudinal lead admitting slot in the wall thereof, a split gripping member at the bottom of said tube, a gripper sleeve on the housing for engagement with the gripper, a spring for normally maintaining the sleeve and gripper in lead gripping engagement, means carried at the top of the tube for selectively bringing the slot in the tube into radial alignment with any of the said grooves, a second slotted tube in the interior of the first mentioned tube for normally blocking the entrance slot in the first mentioned tube, and means for rotating the said second tube out of blocking position.

2. A pencil of the nature described comprising a housing having a plurality of longitudinal lead storing grooves, a longitudinal rotatable tube centrally located with respect to the grooves, the said tube having a longitudinal lead admitting slot in the wall thereof, a split gripping member at the bottom of said tube, a gripper sleeve on the housing for engagement with the gripper, a spring for normally maintaining the sleeve and gripper in lead gripping engagement, means carried at the top of the tube for selectively bringing the slot in the tube into radial alignment with any of the said grooves, said means comprising a stationary clutch member, a clutch member slidable on the said tube and normally in clutching engagement with the stationary clutch member, the said slidable clutch being under the influence of the spring, and a cap secured to the top of the tube by which it may be rotated for the aforementioned selective alignment.

3. A pencil of the nature described comprising a housing having a plurality of longitudinal lead storing grooves, a longitudinal rotatable tube centrally located with respect to the grooves, the said tube having a longitudinal lead admitting slot in the wall thereof, a split gripping member at the bottom of said tube, a gripper sleeve on the housing for engagement with the gripper, a spring for normally maintaining the sleeve and gripper in lead gripping engagement, means carried at the top of the tube for selectively bringing the slot in the tube into radial alignment with any of the said grooves, said means comprising a stationary clutch member, a clutch member slidable on the said tube and normally in clutching engagement with the stationary clutch member, the said slidable clutch being under the influence of the spring, a cap secured to the top of the tube by which it may be rotated for the aforementioned selective alignment, a second slotted tube in the interior of the first mentioned tube for normally blocking the entrance slot in the first mentioned tube, and means for rotating the said second tube out of blocking position.

4. A pencil of the nature described comprising a housing having a plurality of longitudinal lead storing grooves, a longitudinal rotatable tube centrally located with respect to the grooves, the said tube having a longitudinal lead admitting slot in the wall thereof, a split gripping member

at the bottom of said tube, a gripper sleeve on the housing for engagement with the gripper, a spring for normally maintaining the sleeve and gripper in lead gripping engagement, means carried at the top of the tube for selectively bringing the slot in the tube into radial alignment with any of the said grooves, said means comprising a stationary clutch member, a clutch member slidable on the said tube and normally in clutching engagement with the stationary clutch member, the said slidable clutch being under the influence of the spring, a cap secured to the top of the tube by which it may be rotated for the aforementioned selective alinement, a second slotted tube in the interior of the first mentioned tube for normally blocking the entrance slot in the first mentioned tube, a stud having a spiral groove in its peripheral surface secured to the second tube, and a tongue on the slidable clutch member in engagement with the said spiral groove for rotating the said second tube to bring the slot therein into alinement with the slot in the first mentioned tube to permit passage of a lead to and from the said tubes.

5. A pencil of the nature described comprising a housing having a plurality of longitudinal lead storing grooves, means for selecting and receiving a lead from one of said grooves, means for blocking the receiving means after selecting a lead, means for guiding the selected lead into writing position, and means for gripping said lead in writing position.

6. A pencil of the nature described comprising a housing having a plurality of longitudinal lead storing grooves, means for selecting and receiving a lead from one of said grooves, means for blocking the receiving means after selecting a lead, means for guiding the selected lead into writing position, means for gripping said lead in writing position, and means for guiding the lead back into the storing groove.

7. A pencil of the nature described comprising a housing having a plurality of longitudinal lead storing grooves, a longitudinal rotatable lead selecting tube centrally located with respect to the grooves, the said tube having a longitudinal lead admitting slot, means for blocking the said lead admitting slot after a lead has been selected, means for guiding the lead into writing position, and means for gripping the lead in writing position.

8. A pencil of the nature described comprising a housing having a plurality of longitudinal lead storing grooves, a longitudinal rotatable lead selecting tube centrally located with respect to the grooves, the said tube having a longitudinal lead admitting slot, means for blocking the said lead admitting slot after a lead has been selected, means for guiding the lead into writing position, means for gripping the lead in writing position, and means for guiding the lead into its storing groove when the gripping means is released and the pencil is inverted.

9. A pencil of the nature described comprising a housing having a plurality of longitudinal lead storing grooves, a longitudinal rotatable lead selecting tube centrally located with respect to the grooves, the said tube having a longitudinal lead admitting slot, a second longitudinally slotted tube rotatably mounted within the selector tube for blocking the slot in the selector tube, means for bringing the second tube into and out of blocking position, means for guiding the lead

into writing position, and means for gripping the lead in writing position.

10. A pencil of the nature described comprising a housing having a plurality of longitudinal lead storing grooves, a longitudinal rotatable lead selecting tube centrally located with respect to the grooves, the said tube having a longitudinal lead admitting slot, means for rotating the said tube into lead selecting position, spring pressed detent means for releasably maintaining same in rotated position, a second longitudinally slotted tube rotatably mounted within the selector tube for blocking the slot in the selector tube, means for bringing the second tube into and out of blocking position, means for guiding the lead into writing position, and means for gripping the lead in writing position.

11. A pencil of the nature described comprising a housing having a plurality of longitudinal lead storing grooves, a cylinder at the top of the housing, said cylinder having a pair of concentric bores therein, one larger than the other, a rotatable tube passing through the housing and extending into and above the cylinder, the said tube having a longitudinal lead admitting slot intermediate its ends and a second longitudinal slot above the first slot, a second tube rotatable within the first tube and provided with a lead admitting slot, means for bringing the lead admitting slots into and out of alinement with each other, said means comprising a lower stationary toothed clutch member loosely surrounding the first mentioned tube, an upper toothed clutch member slidable on the first tube normally in engagement with the stationary clutch member, a spirally grooved stud at the upper end of the second tube, a tongue on the slidable clutch member extending into the said spiral groove through the upper slot in the first tube, a cap secured to the said first tube, a spring exerting a tension between the said cap and upper clutch member, a split lead gripper at the bottom of the first tube, and a sleeve for normally engaging the said gripper to maintain same in gripping engagement with the lead.

12. A pencil of the nature described comprising a housing having a plurality of longitudinal lead storing grooves, a cylinder at the top of the housing, said cylinder having a pair of concentric bores therein, one larger than the other, a rotatable tube passing through the housing and extending into and above the cylinder, the said tube having a longitudinal lead admitting slot intermediate its ends and a second longitudinal slot above the first slot, a second tube rotatable within the first tube and provided with a lead admitting slot, means for bringing the lead admitting slots into and out of alinement with each other, said means comprising a lower stationary toothed clutch member loosely surrounding the first mentioned tube, an upper tooth clutch member slidable on the first tube normally in engagement with the stationary clutch member, a spirally grooved stud at the upper end of the second tube, a tongue on the slidable clutch member extending into the said spiral groove through the upper slot in the first tube, a cap secured to the said first tube, a spring exerting a tension between the said cap and upper clutch member, a split lead gripper at the bottom of the first tube, a sleeve for normally engaging the said gripper to maintain same in gripping engagement with the lead, a beveled stud in the second tube for directing the lead into the lead storing grooves, when the

pencil is inverted and the tubes are in lead admitting position, and a tapered cam surface in the bottom of the housing for directing the lead into the tubes when in lead selecting position and the cap is depressed against the tension of the spring.

13. A pencil of the nature described compris-

ing a housing having a plurality of longitudinal lead storing grooves, means for selecting and receiving a lead from one of said grooves, and means for blocking the receiving means after selecting a lead.

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