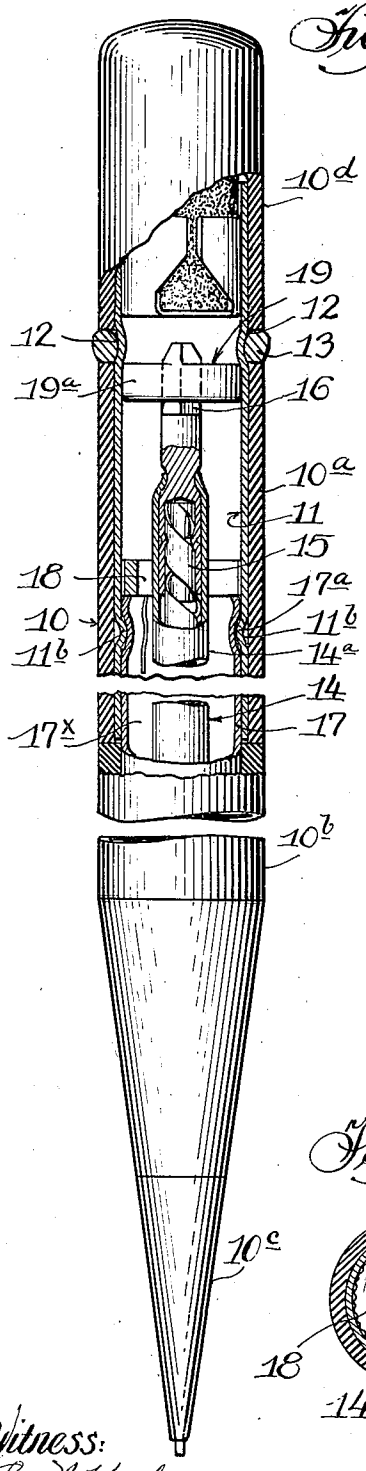
March 3, 1942. H. R. JOCHIM 2,274,702

MECHANICAL PENCIL

Filed April 21, 1941

Fig. 1



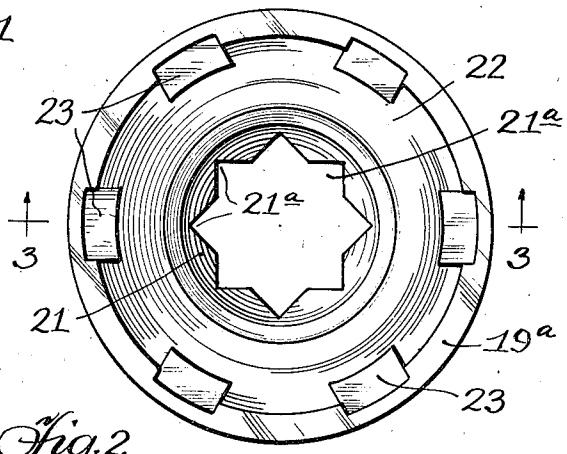


Fig. 2

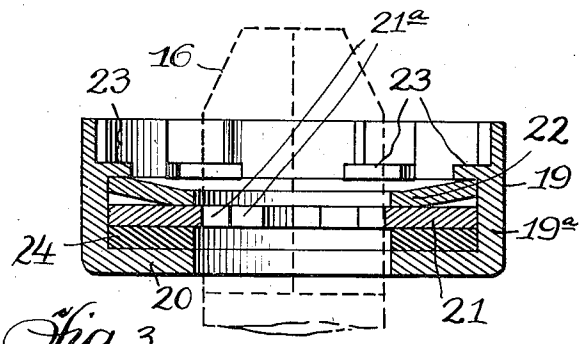


Fig. 3

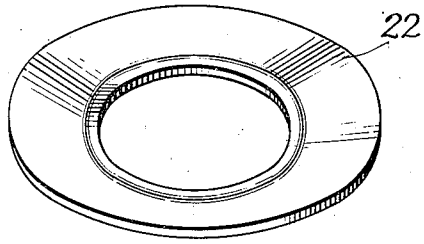


Fig. 4

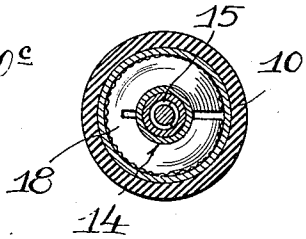


Fig. 5

Witness:
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UNITED STATES PATENT OFFICE

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MECHANICAL PENCIL

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Application April 21, 1941, Serial No. 389,593

4 Claims. (Cl. 120—18)

This invention relates to an improvement in mechanical pencils, and consists of the matters hereinafter described and more particularly pointed out in the appended claims.

The improved pencil is of the advance-retract class, in which the leads approximate the length of the pencil and in which magazines are provided to contain extra leads. A pencil of the kind is shown in Patent No. 1,966,207 granted July 10, 1934, to Herbert H. Lang.

In pencils of the kind, the lead-advancing-and-retracting device is operated by rotating the cap or head. In such pencils when the clutch member which holds the lead is advanced to the point end of the pencil or retracted to the head end of the pencil, it is arrested in either position by a suitable stop. An attempted rotation of the head member in one or the other direction beyond its position when one of said points is reached is apt to damage the lead-feeding mechanism of the pencil.

While means has been provided in pencils of the kind to notify the user of the pencil by a clicking noise that the end of the advance or of the retracting movement of the lead clutch has been reached, this noise is not always effective to prevent the pencil user from continuing the rotative movement of the head beyond the point that it should go.

The object of the present invention is to provide a mechanism in a pencil of the kind whereby when the lead clutch reaches the said limits of movement a further rotation of the lead-feeding mechanism will be made ineffective by reason of an improved drive cup which operates the drive stud and includes a yieldable friction clutch to prevent undue pressures from being transmitted.

The advantages of the invention will appear more clearly as I proceed with my specification.

In the drawing, the pencil and its parts are shown on a greatly exaggerated scale in order that the details of construction may be more readily seen.

Figure 1 is a front view in elevation of the improved pencil, with parts broken away and shown in section in order that the mechanism of the interior may be seen.

Figure 2 is a top plan view of the improved drive cup on a still greater exaggerated scale.

Figure 3 is a view showing a vertical cross-section through Figure 2 in a plane indicated by the line 3—3 of Figure 2.

Figure 4 is a perspective view of a dished washer which is one element of the improved driving cup.

Figure 5 is a view representing a horizontal section of Figure 1 in a plane indicated by the line 5—5 of Figure 1.

Referring now to that embodiment of the invention illustrated in the drawing: 10 indicates the barrel. This is made in two parts, an upper part 10^a and a lower part 10^b. The latter is provided with a tapered tip 10^c in the usual manner. 10^d indicates the familiar cap enclosing an eraser and also designed for rotating the operating assembly. 11 indicates a metal sleeve extending the length of the upper part 10^a of the barrel and frictionally engaged therein. Said sleeve projects beyond the upper end of the barrel part 10^a to receive a cap 10^d. Adjacent the upper end of the barrel 10^a the sleeve is provided with an indented groove 12 which is engaged by a ring 13. This helps to retain the sleeve in the barrel.

Within the lower member 10^b of the barrel is the operating assembly 14 including a spiral 15 and a longitudinally slotted tube 14^a containing the lead clutch and ejecting rod fixed within the lower barrel part 10^b in a familiar manner. Said assembly includes a drive stud 16 projecting at the top and fixed to the rotative member thereof, in this case the spiral 15, in the usual manner. Surrounding the operating assembly 14 and mounted in the lower barrel part 10^b is a sleeve 17. Said sleeve is of greater diameter than the diameter of the operating assembly so that a cylindrical space 17^x is left to provide a reservoir for leads.

The upper end of said sleeve 17 is split and is preferably provided with an annular groove 17^a to yieldingly engage an associated annular rib 11^b formed in the sleeve 11 to yieldingly hold the two parts 10^a and 10^b of the barrel together. A knurled split nut 18 yieldingly held on the driving assembly 14 closes the upper end of the magazine.

Obviously by the construction described the upper part 10^a of the barrel may be withdrawn from the sleeve 17 in order to get at the magazine when new lead is required. The knurled split nut 18 may be then withdrawn from the driving assembly and the lower part 10^b of the barrel upended to obtain a lead.

19 is the drive cup which is fixed within the sleeve 11 of the upper part 10^a of the barrel near its upper end. Said cup has an apertured bottom wall 20 through which the drive stud 16 extends. The cup 19 has an upright circular flange 19^a

within which is seated in the cup an operating disc 21. Said operating disc has a central aperture provided with annularly spaced V-shaped notches 21a opening towards the center of said disc with their apices preferably disposed radially to said center. The stud as shown is polygonal (rectangular as shown) in cross-section and its edges are adapted to be engaged by said notches.

22 indicates a dished spring washer seated on the top of said operating disc and engaged at its upper edges by metal tongues 23 preferably cut from the interior metal of the cup flange 19a and bent down into engagement with the rim of said operating disc 21. An auxiliary washer 24 is preferably disposed between the bottom of the operating disc and the bottom of the drive cup as shown in Figure 4.

The bottom of the dished spring washer 22 is yieldingly engaged against the top of the operating disc 21 so that normally when the upper part 10a of the barrel is rotated, said rotation will be communicated through the operating disc 21 to the drive stud 16. But when the lead clutch reaches the limit of its movement at either end of the barrel so that it cannot with safety be moved any further, the dished washer 22 will yield, and further rotation of the operating disc is prevented.

From the foregoing description, it will be seen that the invention includes a drive cup and a friction clutch made up of a few parts, readily and easily assembled. When it is remembered how small these parts are in actual pencils, the advantage of this feature will be fully appreciated by those familiar with the art.

I claim as my invention:

1. In a mechanical pencil of the kind described, including a barrel made in two parts, one rotative with respect to the other, an operating assembly including a drive stud mounted in the non-rotatable part, a drive cup provided with an annular flange fixed within the rotatable part of said barrel, an apertured disc seated in said cup provided with means for engaging said drive stud, and a yielding member engaged with said apertured disc, the flange of said cup being provided with circumferentially spaced tongues projecting inwardly and engaged with said yielding member.

2. In a mechanical pencil of the kind described, including a barrel made in two parts, one rotative with respect to the other, an operating assembly including a drive stud mounted in the non-rotatable part, a drive cup provided with an annular flange fixed within the rotatable part of said barrel, an apertured disc seated in said cup provided with means for engaging said drive stud, and a yielding member engaged with said apertured disc, the flange of said cup being provided with circumferentially spaced tongues struck from the metal of said flange, projecting inwardly from said flange, and engaged with said yielding member.

3. In a mechanical pencil of the kind described, including a barrel made in two parts, one rotative with respect to the other, an operating assembly including a drive stud mounted in the non-rotatable part, a drive cup provided with an annular flange fixed within the rotatable part of said barrel, an apertured disc mounted in said cup provided with means for engaging said drive stud, and an apertured dished washer engaged with said apertured disc, the flange of said cup being provided with circumferentially spaced tongues projecting inwardly from said flange and engaged with the margin of said spring dished washer.

4. In a mechanical pencil of the kind described, including a barrel made in two parts, one rotative with respect to the other, an operating assembly including a drive stud mounted in the non-rotatable part, a drive cup provided with an annular flange fixed within the rotatable part of said barrel, an apertured disc mounted in said cup provided with means for engaging said drive stud, and an apertured dished washer engaged with said apertured disc, the flange of said cup being provided with circumferentially spaced tongues struck from the metal of said flange, projecting inwardly from said flange, and engaged with said yielding member.

HELMER R. JOCHIM.