Oct. 1, 1940. O. D. WALLETT 2,216,681

PENCIL SHARPENER

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FIG. 1.

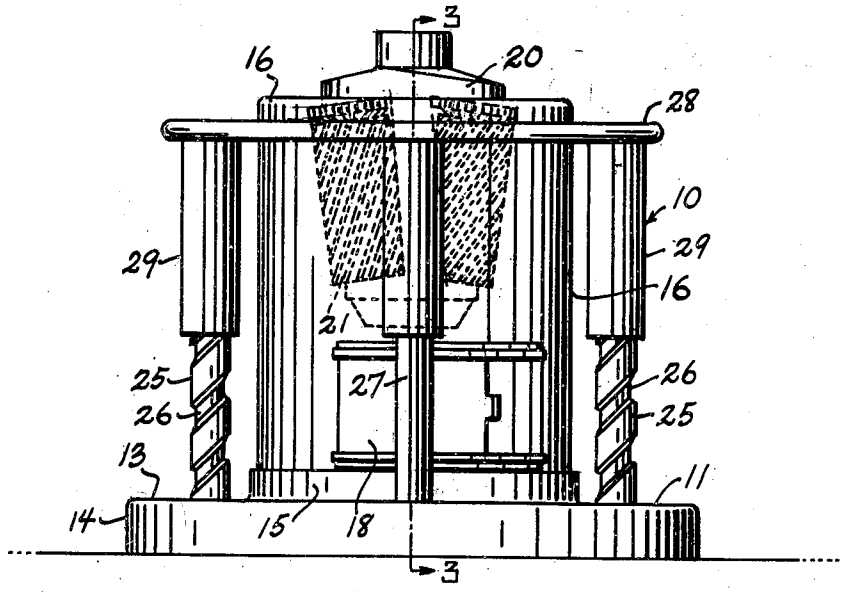
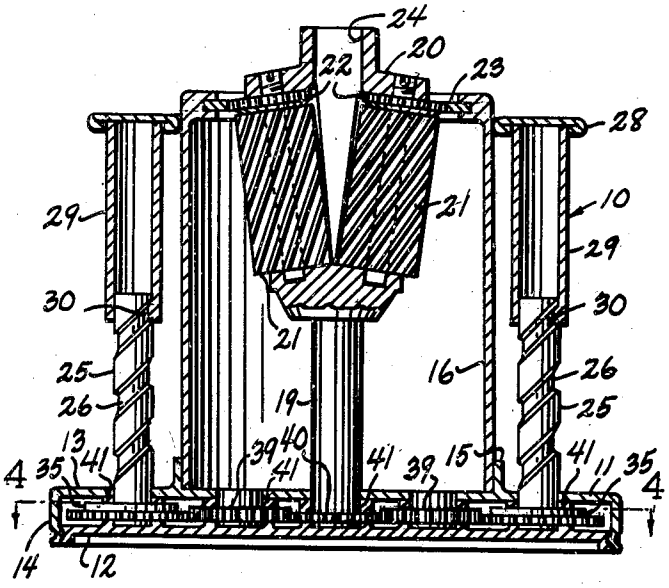


FIG. 2.



INVENTOR.

Oliver D. Wallett

BY Lancaster, Allwine & Rommel

ATTORNEYS.

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FIG. 3.

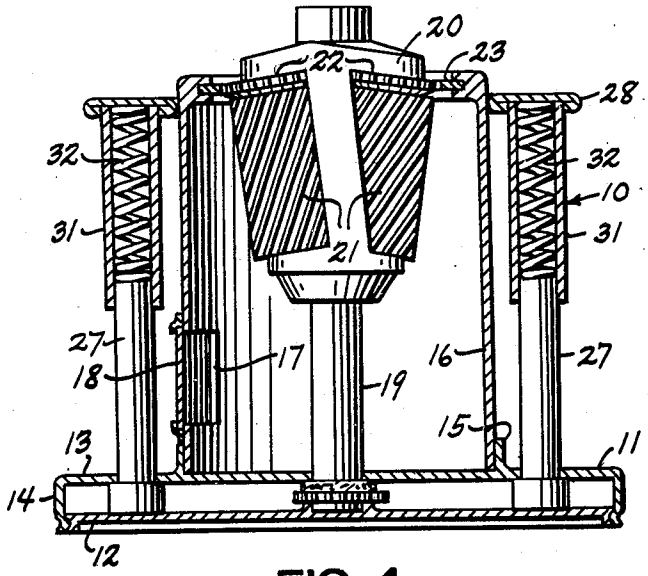
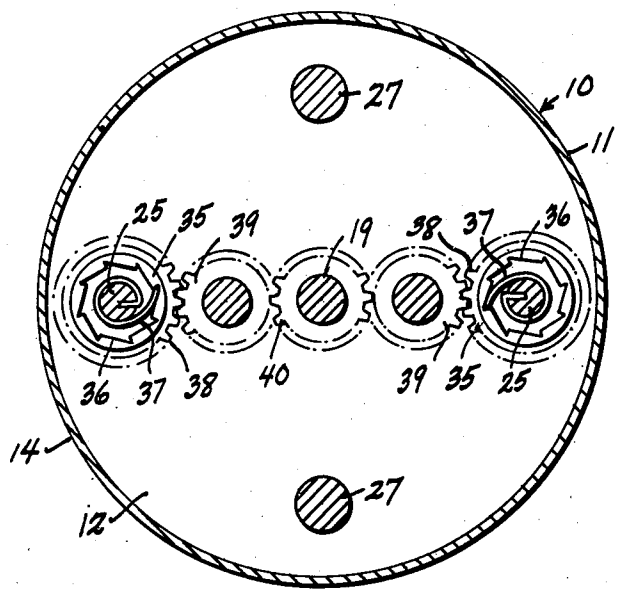


FIG. 4.



INVENTOR.
Oliver D. Wallett

BY Lancaster, Allwine & Rommel
ATTORNEYS.

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PENCIL SHARPENER

Oliver D. Wallett, Richmond Hill, N. Y.

Application July 12, 1940, Serial No. 345,212

10 Claims. (Cl. 120—96)

The present invention relates to improvements in pencil sharpeners and more particularly to improvements in pressure operated pencil sharpeners of the character shown and described in U. S. Patent #1,494,988 granted to Joseph H. Boyd.

In the just mentioned Boyd patent is disclosed a pencil sharpener operable by alternate application and release of pressure on a vertically reciprocable member and including a rotary cutter head that rises and falls with the reciprocable member.

One of the objects of the present invention is to provide a pencil sharpener operable by alternate application and release of pressure on a vertically reciprocable member and including a rotary cutter head operably connected to the reciprocable member but not reciprocable therewith.

Another object of the invention is the provision of a pencil sharpener including a reciprocable plunger and a rotary cutter head connected thereto by motion transmitting means for imparting intermittent unidirectional rotation to the cutter head upon reciprocation of the plunger.

Other objects and advantages of the invention will become apparent during the course of the following detailed description, taken in connection with the accompanying drawings, forming a part of this specification, and in which drawings,

Figure 1 is a view in side elevation of the pencil sharpener.

Figure 2 is a central vertical sectional view thereof.

Figure 3 is a central vertical sectional view on the line 3—3 of Figure 1.

Figure 4 is a horizontal sectional view on the line 4—4 of Figure 2.

In the drawings, which for the purpose of illustration show only a preferred embodiment of the invention, and wherein similar reference characters denote corresponding parts thruout the several views, the numeral 10 generally designates the pencil sharpener, including a circular base 11 comprising a bottom plate 12 and a cover plate 13 provided with a down-turned peripheral flange 14 encircling the bottom plate. Fixedly mounted on the base, as by fitting within an annular upstanding flange 15 thereon, is a cylindrical receptacle or container 16, of a diameter less than that of the base formed of transparent or other suitable material and having a side opening 17 provided with a suitable door or closure 18. Supported at its foot end portion for rotation axially of the base is an upright driven shaft 19 carrying a cutter head 20 bearing upwardly divergent cylindrical cutters 21 provided adjacent their upper ends with spur gears 22 meshing with a stationary ring gear 23 fixed within the upper end of the container 16. The cutter head 19 is of course provided with an axial opening 24 extending downwardly between the cutters 21 for receiving the end of a pencil to be sharpened.

Supported at their foot end portions intramarginally of the circular base 11 and exteriorly of the container 16 are a plurality of upright drive shafts 25 provided with helical grooves 26 and a plurality of upright plain shafts 27. Encircling the container 16 is an annular yoke or plunger member 28 provided with depending drive tubes 29 telescopically slidable on the drive shafts 25 and having internal lugs 30 disposed in the drive shaft grooves 26. Also depending from the yoke or plunger member 28 are plain tubes 31 telescopically slidable on the plain shafts 27 and containing expansion coil springs 32. In the example shown, two drive shafts 25 and two plain shafts 27 are alternately arranged in equidistantly spaced relation at a given radial distance intramarginally of the circular base.

Motion transmitting means is provided between the drive shafts 25 and the driven shaft 19 for imparting intermittent unidirectional rotation of the driven shaft upon oscillation or rocking movement of the drive shafts. Floating on the foot end portions of the drive shafts 25 are ratchet gears 35 including internally toothed ratchet portions 36 cooperable with spring pawls 37 fixed on the drive shafts and externally toothed spur portions 38 meshing with idler gears 39 which in turn mesh with a spur gear 40 fast on the driven shaft 19. In order to prevent pencil cuttings or shavings from entering the base, the shafts therein are encircled with felt washers 41 superjacent the gears and which may be saturated with lubricant, if desired. The spur portions 38 of the ratchet gears 35 are of a diameter larger than that of the driven shaft gear 40 to secure a favorable gear ratio between the drive shafts 25 and the driven shaft 19, and at the same time enable the drive shaft grooves 26 to be steeply pitched for easy telescoping of the drive tubes thereon, without loss of turning capacity.

In the operation of the pencil sharpener, the same may be placed on any suitable support, such as a table or desk, and after inserting the end of a pencil (not shown) in the top opening 24, it is only necessary to depress and release the annular plunger member 28 one or more times. Descent of the plunger member 28 will rotate

the spirally grooved drive shafts 25 in a counterclockwise direction whereby to carry the pawls 37 into engagement with the ratchet portions 36 so that the shaft 19 is driven by the gears 39, 40. Rotation of the driven shaft 19 will of course turn the cutter head 20 and cause the cutters 21 to revolve therein, thru travel of the cutter gears 22 in mesh with the stationary ring gear 23. Upon release, the plunger member will be elevated by expansion of the springs 32, whereby to rock the spirally grooved drive shafts 25 in the opposite direction but this will not affect the cutter head since the pawls 37 will merely ride over the teeth of the ratchet portions 36. It will therefore be seen that I have provided a pencil sharpener operable by alternate application and release of pressure on a plunger member and wherein the cutter head is rotated in a cutting or sharpening direction only and does not fall and rise as the plunger member is depressed and released.

Various changes may be made in the form of the invention herein shown and described without departing from the spirit of the invention or the scope of the following claims.

I claim:

1. In a pencil sharpener, a base, a container fixed thereon, a ring gear fixed within the container, a driven shaft within the container including a foot end portion rotatably supported by the base and a free end portion provided with a cutter head, rotary cutters on the head provided with gears meshing with the ring gear, a drive shaft outwardly of the container including a foot end portion rotatably supported by the base and a free end portion motion transmitting means between the foot end portions of the drive and driven shafts, and a tube telescoping on the free end portion of the drive shaft, said tube and drive shaft having helical screw threaded engagement one with the other to impart rocking movement to the drive shaft upon reciprocatory movement of the tube.

2. In a pencil sharpener, a base, a container mounted on the base, a ring gear fixedly supported by the container, a driven shaft axially of the ring gear and having a foot end portion rotatably carried by the base and a head end portion, rotary cutters carried by the head end portion, gears meshing with the ring gear for operating the cutters, a drive shaft having a foot end portion rotatably carried by the base, a plunger member including a tube telescopically slidable on the drive shaft, said drive shaft having helical screw threaded engagement with the tube to impart rocking movement to the drive shaft upon reciprocatory movement of the plunger member, and motion transmitting means between the drive shaft and the driven shaft for imparting intermittent unidirectional rotation to the driven shaft upon rocking movement of the drive shaft.

3. In a pencil sharpener, a base, a container mounted on the base, a cutter mounted on the base for rotation within the container, an annular plunger reciprocably slidable longitudinally of the container, and motion transmitting means between the annular plunger and the cutter for imparting rotatory movement to the cutter upon reciprocatory movement of the annular plunger.

4. In a pencil sharpener, a base, a ring gear fixedly mounted on the base, a driven shaft axially of the ring gear and rotatably supported by the base, rotary cutter means carried by the driven shaft, gear means meshing with the ring gear for operating the rotary cutter means, a plunger member, a gear fast on the driven shaft, and at least two gears with rotating means therefor, operated by the plunger member and meshing with the gear on the driven shaft.

5. In a pencil sharpener, a base, a ring gear fixedly mounted on the base, a driven shaft axially of the ring gear and rotatably supported by the base, rotary cutters carried by the driven shaft, at least one gear between each cutter and the ring gear, a plunger member, a gear fast on the driven shaft and at least two gears with rotating means therefor, operated by the plunger member and meshing with the gear on the driven shaft.

6. In a pencil sharpener, a base, a ring gear fixedly mounted on the base, a driven shaft axially of the ring gear and rotatably supported by the base, rotary cutters carried by the driven shaft, at least one gear between each cutter and the ring gear, a vertically reciprocable plunger member, spring means for elevating the plunger member, a gear fast on the driven shaft, and at least two gears with rotating means therefor, operable by the plunger member and meshing with the gear on the driven shaft.

7. In a pencil sharpener, a base, a ring gear fixedly mounted on the base, a driven shaft axially of the ring gear and rotatably supported by the base, rotary cutters carried by the driven shaft, at least one gear between each cutter and the ring gear, a vertically reciprocable plunger member, spring means for elevating the plunger member, at least two drive shafts connected for oscillation by said reciprocable plunger member, and motion transmitting means between the drive shafts and the driven shaft including a pawl and ratchet connection for imparting intermittent unidirectional rotation to the driven shaft upon oscillation of said drive shafts.

8. In a pencil sharpener, a base, a driven shaft having a foot end portion rotatably carried by the base and a head end portion, cutting means carried by the head end portion, a drive shaft having a foot end portion rotatably carried by the base, a plunger member including a tube telescopically slidable on the drive shaft, said drive shaft having helical screw threaded engagement with the tube to impart rocking movement to the drive shaft upon reciprocatory movement of the plunger member, and motion transmitting means between the drive shaft and the driven shaft for imparting intermittent unidirectional rotation to the driven shaft upon rocking movement of the drive shaft.

9. In a pencil sharpener, a base, a cylindrical container fixed thereon, a ring gear fixed within the container, a driven shaft axially of the container and including a foot end portion rotatably supported by the base and a free end portion provided with a cutter head, rotary cutters on the head provided with gears meshing with the ring gear, drive shafts outwardly of the container in equidistantly spaced parallel relation to the driven shaft and including foot end portions rotatably supported by the base and free end portions, motion transmitting means including a pawl and ratchet connection between the foot end portions of the driven shaft and the drive shaft, for imparting intermittent unidirectional rotation to the drive shaft upon rocking movement of the driven shafts, an annular plunger encircling the container, tubes secured to the plunger and telescopically sliding on the drive shafts at their free end portions, said tubes and drive shafts each having helical screw threaded engagement one with the other to impart rocking movement to the

drive shaft upon reciprocatory movement of the plunger longitudinally of the container, and means resiliently urging the plunger toward that end of the container remote from the base.

10. In a pencil sharpener, a base, a cylindrical container fixed thereon, a ring gear fixed within the container at its end remote from the base, a driven shaft axially of the container and including a foot end portion rotatably supported by the base and a free end portion provided with a cutter head, rotary cutters on the head provided with gears meshing with the ring gear, stub shafts outwardly of the container in equidistantly spaced parallel relation to the driven shaft and including foot end portions carried by the base and free end portions, an annular plunger encircling the container, tubes secured to the plunger and telescopically sliding on the stub shafts at their free end portions, said tubes containing expansion coil springs for resiliently urging the plunger toward that end of the container remote from the base, a given one at least of said stub shafts having helical screw threaded engagement with its telescopically associated tube for rocking of said given stub shaft upon reciprocatory movement of the plunger longitudinally of the container, and motion transmitting means including pawl and ratchet mechanism between said given stub shaft and the driven shaft for imparting intermittent unidirectional rotation to the driven shaft upon rocking movement of the given stub shaft.

OLIVER D. WALLETT.