Jan. 2, 1934. C. P. BOHLAND 1,941,823

PENCIL SHARPENER

Filed April 3, 1933

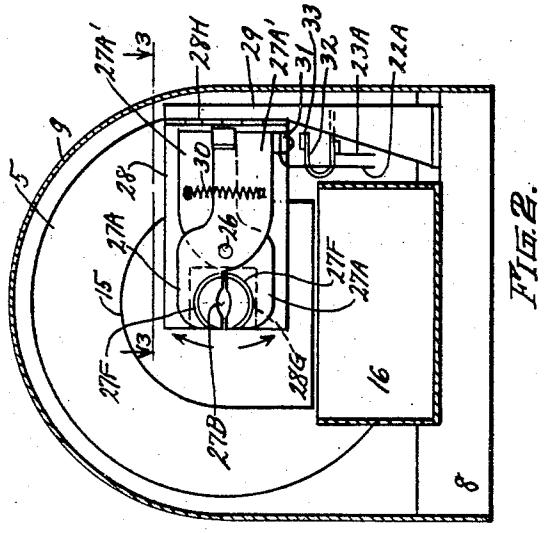


FIG. 2.

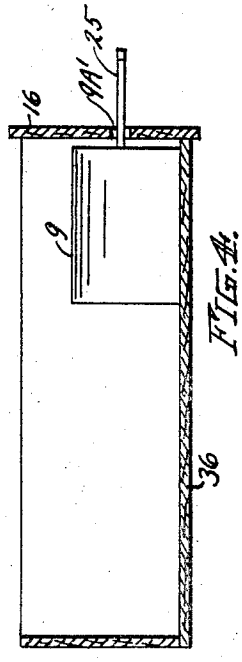


FIG. 4.

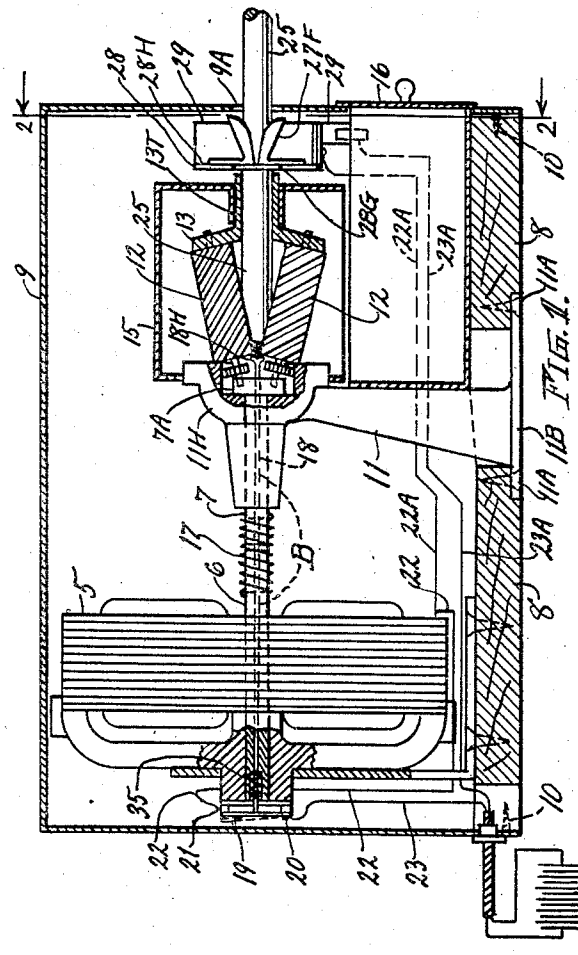


FIG. 1.

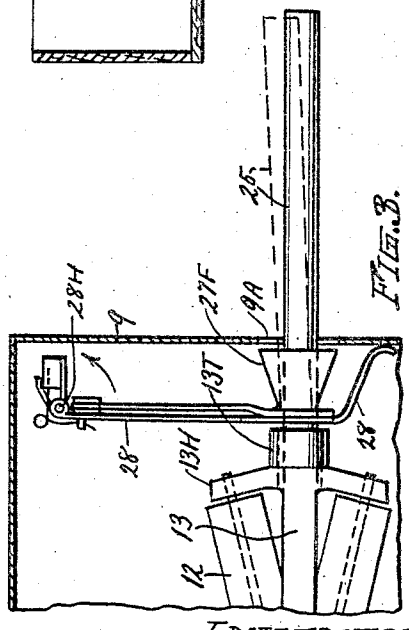


FIG. 3.

INVENTOR:
Carl P. Bohland
BY David E. Carlsen
ATTORNEY.

Patented Jan. 2, 1934 1,941,823

UNITED STATES PATENT OFFICE

1,941,823

PENCIL SHARPENER

Carl P. Bohland, St. Paul, Minn.

Application April 3, 1933. Serial No. 664,103

6 Claims. (Cl. 120—96)

My invention relates to an electrically operated pencil-sharpener adapted to be used as a portable or stationary device wherever electric current is available.

The main object is to provide a simple, highly efficient and inexpensive pencil-sharpener with certain automatic stopping and starting features as hereinafter fully set forth reference being had to the accompanying drawing, in which:

Fig. 1 is a longitudinal sectional elevation of my device in operative position.

Fig. 2 is a right or front end elevation of Fig. 1 taken on a plane represented by line 2—2 in Fig. 1 just within the front wall of the casing.

Fig. 3 is an enlarged sectional, detail view of the pencil intake end of my device about as on line 3—3 in Fig. 2, and Fig. 4 is a longitudinal section of a desk drawer or the like and in which my pencil-sharpener is located in proximity to the front wall of said drawer and the sharpener accessible through an aperture in the drawer front.

Referring to the drawing by reference numerals, my device embodies an electric motor 5 the drive shaft or rotor 6 of which is alined with the rotor shaft 7 of a pencil-sharpener unit, said latter unit and the motor mounted on a common base 8 illustrated as an elongated quadrangular wooden block. The entire mechanism and the base are preferably inclosed by a one-piece sheet metal housing 9 suitably removably fixed to the block 8 as with screws 10 or equivalent means. Thus the mechanism is completely inclosed except that an aperture 9A is provided in the front end of the casing, concentric of and registering with the rotor 7 of the sharpener, this for insertion of pencils to be sharpened.

This device involves the use of any suitable rotary pencil sharpener for example the type shown having a main pedestal or stand 11 with a base 11B securable at 11A the upper end of said base comprising a bearing head 11H in which shaft 7 is journaled. An enlarged part of shaft 7, designated 7A (within head 11H) comprises journal means for the inner shaft end parts of a pair of spiral-knife rotors 12 extending forward in flared inclines and their forward ends journaled in a revolving cross-head 13H comprising an integral part of a rotatable frame 13 also integral of and extending forward from part 7A of rotor 7. The forward end of said frame 13 is formed with a tubular hub 13T in alinement with rotor 7, the base thereof being for insertion of a pencil 25 between the cutting members 12, all this construction being well known in the art but herein described to more fully disclose the features of my device. 15 is a downwardly open shell adapted to be frictionally and removably retained on head 11H and hub 13T simultaneously. Its opening is directly over a drawer 16 to catch shavings from the sharpener and said drawer is preferably insertible in an aperture in the front wall of the main housing.

The front walls of the shell 15 and of the main housing are spaced apart when in normal positions and in the space therebetween I mount a certain device for primary contact of a pencil being inserted for sharpening and to control electric circuit for starting and stopping the motor as will presently be described.

The motor shaft 6 and the alined rotor shaft 7 are preferably connected by a coil spring 17 encircling the adjacent end parts of said shaft and the ends thereof connected one to each shaft (see Fig. 1) to provide a yieldable but positive power transmission to the sharpener unit.

Throughout the entire length of shafts 6—7 they have a small, central bore designated B in which is placed a reciprocable rod or bar 18, the front end of said bar comprising a head 18H with a central denture arranged to be contacted by the point of a pencil, sharpened by the rotating knife rollers. The rear end of rod 18 projects from the rear end of rotor shaft 6 and contacts with a leaf-spring circuit breaker 19 fixed at 20 to any fixed part of the motor adjacent the end of shaft 6. The free end of member 19 normally contacts with a fixed terminal 21 from which a circuit wire 22 leads to the motor, another circuit wire 23 extending from terminal 20 to a suitable source of current 24. 22A is a branch of wire 22, and 23A is a wire extending from 24 to a primary circuit control device located forward of the pencil sharpener unit, as previously mentioned. 22A is a branch of wire 22 as stated, and comprises the second circuit wire of the primary circuit control (Fig. 1).

The primary circuit control is a device for closing circuit by means of a pencil 25 insertible through aperture 9A and between two flared metal members forming a funnel-like contact 27F and each comprising the forward part of a jaw 27A of an expansible scissor like device crossed and pivoted at 26, said device mounted in a vertical plane and its pivot 26 secured in a vertical plate 28 hingedly secured at 28H to a post 29 and said plate normally in vertical plane just forward of the front wall of housing 15. This plate has a gap 28G registering with the opening of shell 15 and permitting passage of a

pencil into the sharpener, said pencil when projected inwardly spreading the members 27F and causing closing of circuit and rotation of the motor and sharpener as will presently be described.

The rear parts of jaws 27A comprise a pair of partially overlapped arms 27A', normally held closed, yieldably, by a coil spring 30 or equivalent and holding jaws 27A closed so that their funnel-like parts 27F normally closed, the innermost part of said jaws formed to provide an elongated opening 27B between them (see Fig. 2). Obviously when a pencil 25 is inserted between jaws 27F they will be forced apart, spreading the members 27A' apart and the lower one of the latter is provided at its free lower end with a suitably insulated contact 31 to which wire 22A is connected. In spaced relation to said contact is mounted, preferably on a yieldable spring 32, a contact 33, in the path of contact 31 and engaged by the latter when the jaw members are spread, completing circuit through wire 23A (attached to contact 33). Thus it will be understood that as soon as a pencil is inserted in the primary device and spreads its jaws, circuit is closed, the motor and pencil-sharpener are set in motion and continue to run as long as a pencil is in the device. The pencil is pushed inwardly in the usual manner becoming sharpened by the rotating members 12. The point of the pencil (its lead) then contacts in the head 18H of rod 18 pushing the latter rearwardly and breaking contact at 19—21 thus automatically opening circuit and stopping the motor simultaneously as the pencil-sharpening process is completed.

The normal spring pressure at 19 causes circuit closing when the pencil is withdrawn but this is only momentary until the pencil is completely withdrawn from the device at which time the primary circuit control resumes its normally closed position and the circuit is again open. The rod 18 which opens circuit at 19 as described, may further be provided with a compression coil spring 35 in an enlargement of its bore (at the rear end) near 19, said spring normally pressing the rod forward.

A feature of this device is that because of the elongated gap 27B between the jaw members 27F and the easily yieldable spreading of the latter, a pencil 25 inserted between them and being sharpened by the knife-rollers 12, may be gyrated exteriorly of the device or held in a slightly angular plane (as indicated by dotted lines in Fig. 3). When thus held the pencil is fulcrumed in the collar 13T of the sharpener and the inner end of the pencil contacted with the rotary cutters all at one side of center, this causing an extremely sharp point to be made on the pencil lead and particularly useful for draughtsman's work. Obviously the contact of the pencil point, moving rod 18 rearwardly to open circuit, is preferably a very sensitive action in order not to break the pencil point.

The invention as hereto described is a preferred construction. Obviously a number of modifications in various details may be embodied without departing from the scope and spirit of the invention. The housing 9 may be dispensed with if the device is so located as to be otherwise protected or guarded. In Fig. 4 the complete device is shown located in the forward part of the bottom of a desk drawer 36, in which case an aperture 9A' must be provided in the drawer front for insertion of a pencil 25.

Among other features of this device are its compactness, and the yieldable but positive drive provided by the coil spring 17 connecting shafts 6 and 7.

I claim:

1. In a pencil-sharpener the combination of a rotary spindle formed with a tubular pencil intake end and means operated by the rotary motion of said spindle to sharpen a pencil inserted axially into said tubular end toward the inner end of said spindle, an electric motor mounted in proximity to said spindle with its drive shaft in axial alinement with the said spindle, an electric circuit, a primary circuit control device mounted in front of the intake end of the spindle, to close and open electric circuit to consecutively start and stop rotation of the sharpener by contact and movement of a pencil into the sharpener and out of it, and a secondary circuit control device in the circuit adapted to open the circuit by contact of pencil point when sharpened.

2. In a pencil sharpener the combination of a rotary spindle formed with a tubular pencil intake end and means operated by the rotary motion of said spindle to sharpen a pencil inserted axially into said tubular end toward the inner end of said spindle, an electric motor mounted in proximity to said spindle with its drive shaft in axial alinement with the said spindle, yieldable driving connection means connecting the adjacent ends of the motor shaft and said spindle; an electric circuit, a primary circuit control device mounted in front of the intake end of the spindle, to close and open electric circuit to consecutively start and stop rotation of the sharpener by contact and movement of a pencil into the sharpener and out of it, and a secondary circuit control device in the circuit adapted to open the circuit by contact of pencil point when sharpened.

3. The structure specified in claim 1 in which said primary circuit control device comprises a base plate positioned normally in proximity to the forward spindle end and provided with an aperture for insertion of a pencil therethrough, a pair of scissor-like members pivotally secured on said plate and the jaws thereof normally closed directly forward of said aperture, said jaws comprising further a pair of opposite contact members constituting together an inwardly tapering pencil contact one half of each said tapering member comprising an integral part of the jaw, both said jaws adapted to be spread frictionally by contact of a pencil and passage of it therethrough into the spindle, and circuit closing means associated with the arms of said contact member and arranged to close circuit and maintain it closed while the jaws are spread.

4. In a pencil sharpener the combination of a rotary spindle formed with a tubular pencil intake end and means operated by the rotary motion of said spindle to sharpen a pencil inserted axially into said tubular end toward the inner end of said spindle, an electric motor mounted in proximity to said spindle with its drive shaft in axial alinement with the said spindle, yieldable driving connection means connecting the adjacent ends of the motor shaft and said spindle; an electric circuit, a primary circuit control device mounted in front of the intake end of the spindle, to close and open electric circuit to consecutively start and stop rotation of the sharpener by contact and movement of a pencil into the sharpener and out of it, and a second-

ary circuit control device in the circuit adapted to open the circuit by contact of a pencil point when sharpened, said spindle and the alined motor shaft provided with a continuous central bore, an oscillatable rod within said bore and its forward end formed with a contact member arranged to be contacted by the pencil point and oscillated rearwardly, and yieldable means mounted in proximity to the rear end of the motor shaft, in the electric circuit, and arranged to open circuit by the rearward motion of said rod, for the purpose set forth.

5. In an automatic electric pencil-sharpener an elongated base, an electric motor mounted on the rear end part thereof, a rotary pencil-sharpener mounted on said base forward of the motor, said sharpener comprising in part a spindle tubular in its forward end and alined with the motor shaft, and driving means connecting said spindle and shaft, rotary cutter members associated with said spindle and arranged to sharpen a pencil point therebetween, a primary circuit control device comprising a pair of crossed pivotally mounted levers forward of the spindle and including a pair of jaws adapted to be spread by insertion of a pencil into the spindle and between its cutters and means in circuit and on said lever members to close circuit and rotate the motor and spindle, and a secondary circuit control in spaced relation to said primary control and adapted to open circuit when a pencil has reached a predetermined inward position in the spindle.

6. The structure specified in claim 5, and yieldable spring means normally closing said lever members and the electric circuit open, a horizontal pin comprising the pivot of said levers, a vertical plate in which said pin is fixed, a post mounted at the front end of the device and said plate normally positioned in a vertical plane transversely with relation to the front end of the spindle, the rear end part of said spindle comprising a shaft suitably journaled and in axial alinement with the motor shaft and means yieldably but rigidly connecting the adjacent ends of the spindle and the motor shaft.

CARL P. BOHLAND.