Feb. 10, 1931. J. E. WAHL 1,791,776

DEVICE FOR OPERATING ON NIBS

Filed June 28, 1926 2 Sheets-Sheet 1

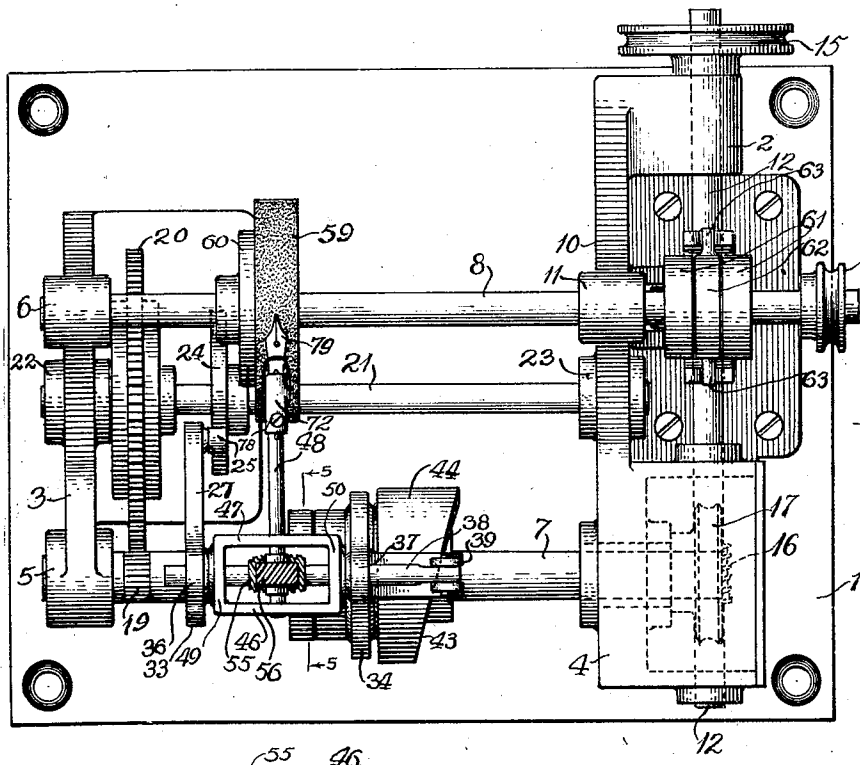


Fig. 1.

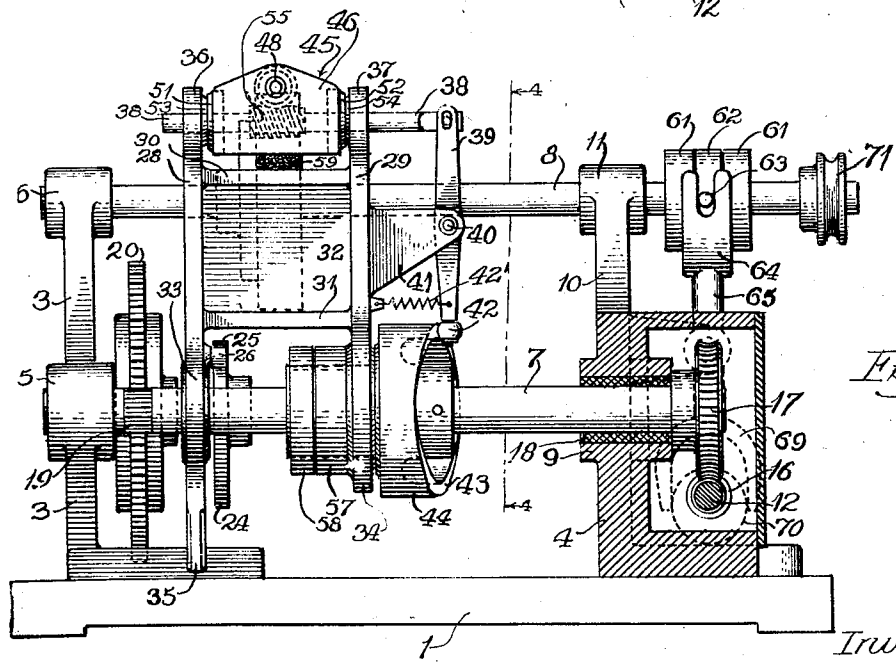


Fig. 2.

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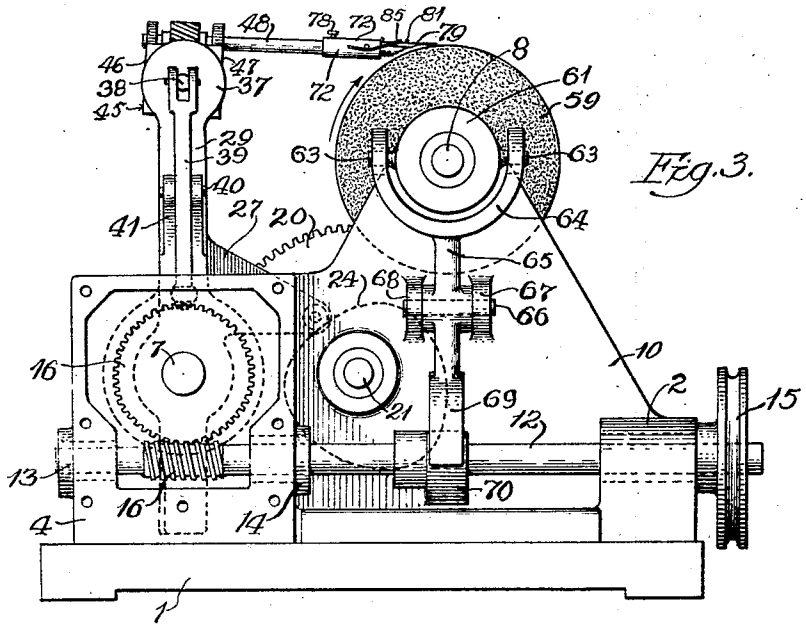
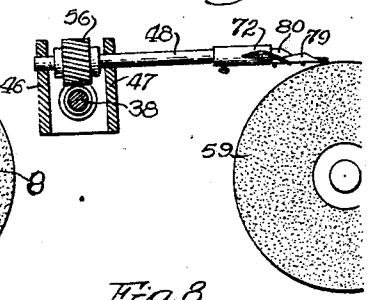


Fig. 3.

Fig. 5.



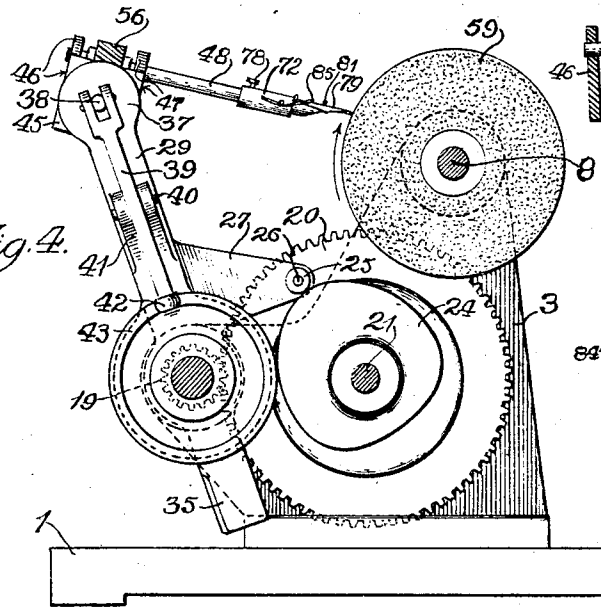


Fig. 4.

Fig. 8.

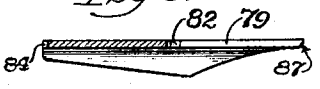


Fig. 9.

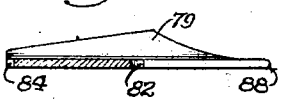


Fig. 6.

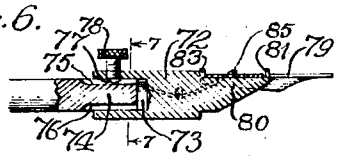


Fig. 7.



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UNITED STATES PATENT OFFICE

JOHN ESTABROOK WAHL, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE WAHL COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF DELAWARE

DEVICE FOR OPERATING ON NIBS

Application filed June 28, 1926. Serial No. 118,838.

The present invention relates to devices for operating on nibs, such as the point thereof.

Among the objects of the invention is to provide a novel device for operating on nibs, such as the finishing of the point thereof, the operations being carried out mechanically and automatically from the placing of the nib in place to the removal thereof, when the nib will be substantially in condition for immediate use.

Another object of the invention is to provide means for efficiently and readily finishing the points of nibs or pens with the avoidance of the labor, time and costs heretofore required by hand or other methods, or operations, as well as producing more uniform and regular results with less waste and the like.

A further object is to provide novel means capable of performing the side or edge grinding, flat grinding, squaring and the rounding of the point, in not more than two automatic mechanical operations without any supplemental hand work to perfect the desired results or products.

The invention comprehends other advantages, capabilities, objects and features as will later appear and are inherently possessed by the invention.

Referring to the drawings, Fig. 1 is a top plan view of a device constructed in accordance with the invention.

Fig. 2 is a side view in elevation of the same with parts shown in section.

Fig. 3 is an end view in elevation of the same.

Fig. 4 is a transverse sectional view taken in a plane represented by line 4—4 in Fig. 2 of the drawings.

Fig. 5 is a fragmentary transverse sectional view taken in a plane represented by line 5—5 in Fig. 1 of the drawings.

Fig. 6 is a longitudinal sectional view of a nib holding means and a nib.

Fig. 7 is a transverse sectional view of the nib holding device and taken in a plane represented by line 7—7 in Fig. 6 of the drawings.

And Figs. 8 and 9 are longitudinal sectional views of nibs showing different stages of the operation.

Referring now more in particular to the drawings, the embodiment chosen to illustrate the invention is shown as comprising a supporting means or base 1 formed with a bearing 2, bearing carrying bracket 3 and a gear housing or box 4, the bracket 3 carrying bearings 5 and 6 for shafts 7 and 8 and the gear housing carrying a bearing 9 for the shaft 7 and also being formed with a bracket 10 carrying a bearing 11 for the shaft 8, the bearing 2 serving as a bearing for a shaft 12. The gear housing 4 also has bearings 13 and 14 for the shaft 12.

The shaft 12 is operated through any suitable power transmitting means connected to a pulley 15 or the like secured to one end of the shaft 12, and also carries a worm screw 16 meshing with and adapted to drive a worm gear 17 secured to an end of the shaft 7 adjacent the bearing 9, the latter being provided with suitable bearing material 18 as clearly shown in Fig. 2 of the drawings. The shaft 7 carries a pinion 19 in driving engagement with a gear 20 secured to a shaft 21 rotatably supported in bearings 22 and 23 forming parts of the brackets 3 and 10. The shaft 21 has fastened to it a cam 24 cooperating with a cam roller 25 rotatably carried upon a stud 26 fixed to an arm 27 forming a rigid and an integral part of a swinging mechanism or arm structure having side portions 28 and 29 connected by cross-members 30 and 31 and a reinforcing web part 32. The lower ends of the side members 28 and 29 are provided with apertured parts 33 and 34 for the free rotation thereof about the shaft 7, the part 33 having a lower extending portion 35 which is weighted to act as a counterweight for the arm device mentioned.

At the upper ends of the members 28 and 29 are provided bearings 36 and 37 for slidably supporting a shaft or rod 38 pivotally connected at one end thereof to a lever 39 fulcrumed at 40 upon a laterally extending bracket 41 made rigid and integral with the side member 29, the lower end of the lever 39 carrying a cam roller 42 cooperating with a cam surface 43 of a cam 44 secured to the shaft 7. The cam roller 42 is held against

the cam surface 43 by any suitable spring means 42'.

Between the bearings 36 and 37 is located a cross-head or carrier 45 rotatably supported upon the shaft 38 and having side walls 46 and 47 provided with bearings for rotatably supporting a spindle shaft or shank 48, and having end walls 49 and 50 provided with thrust bearing bosses 51 and 52 in thrust contact with similar bosses 53 and 54 provided on the inner faces of the bearings 36 and 37. The shaft 38 carries a spiral rack 55 which operatively engages or meshes with a spiral pinion or gear 56 secured to the spindle or shaft 48.

On the shaft 7 may be secured suitable spacing means in the form of collars 57 and 58 for properly locating the swinging arm means 28 and 29 between the cam 44 and the collars 57 and 58, adjustment being made in any well known manner for varying the throw of the lever 39 and the sliding shaft 38.

The shaft 8 is both rotatably and slidably mounted in the bearings 6 and 11 and carries a grinding wheel 59 of any suitable type which may be secured to the shaft by way of a plate 60, as clearly shown in the drawings. For the purpose of causing the shaft 8 to have a longitudinal movement while at the same time rotating, the shaft carries a pair of collars 61 between which is loosely mounted a yoke collar 62, yoke pins 63 received freely and rotatably in the slots of slotted arms of a yoke 64 integral with the upper end of a lever 65 pivotally mounted on pintle 66 carried in ears 67 and 68 formed integral with a side wall of the bracket member 10, the lower end of the lever 65 having a cam engaging arm 69 cooperating with a cam 70 secured to the shaft 12. The outer end of the shaft 8 carries a grooved pulley 71 which may be driven by a suitable means, such as a belt so as to impart rotation to the grinding wheel 59 while it is at the same time given a sliding or reciprocating motion by the cam and yoke mechanism.

At the forward end of the nib carrying spindle is connected a nib carrying or holding means 72 preferably provided with a socket 73 to receive the forward end 74 of the spindle, the end 74 being provided with diametrically opposed grooves 75 and 76 for receiving the tapered end 77 of a set screw 78 threaded through the rear end of the holder 72. The forward end of the holder is formed to support a nib 79 in place to be operated upon by the grinding wheel. In order that the nib may be properly positioned upon the holding means, a shouldered or reduced-diameter part 80 of the holder is provided with a centering pin 81 adapted to pass through a perforation 82 usually provided in the nib, and also a centering projection 83 adapted to fit into or be received by a notch 84 formed at the central rear portion of the nib. In this way the nib is placed with the center line thereof in a plane passing through the axis of the nib holding device and spindle. A spring 85 may be secured in any suitable manner to the holder 72 and passed over the back of the nib to hold the same firmly in place upon the part 80 of the holder.

In the operation of the device the pulleys 15 and 71 operate the mechanism, the pulley 71 driving the shaft 8 and the grinding member 59. The remaining operations are performed by way of a shaft 12 driven by the pulley 15. The shaft 12 drives through the worm 16 and gear 17 to effect a rotation of the cam 44 and the pinion 19, the latter in turn causing a rotation of the gear 20 and shaft 21 and the cam 24 thereon. The shaft 12 also operates through the cam 70 and cam arm 69 to operate the lever 65, yoke 64 and the collar 61 fixed to the shaft 8, effecting a longitudinal reciprocation of the grinding wheel 59 as the same is being rotated.

The cam 24 operates against the arm 27 to cause the arm construction 28 and 29 and the parts carried thereby to swing about the axis of the shaft 7 from the position shown in Fig. 3 to the position shown in Fig. 4 thereof. While this operation is being effected the pen holding spindle and cross-head 45 will turn about the axis of the shaft 38 permitting the pen spindle to ride by gravity downwardly over an inclined part of the periphery of the grinding wheel 59, the rotation of this wheel being in a clockwise direction as viewed in Fig. 4 of the drawings and as indicated by the arrow therein. As the point of the nib is caused to move in the direction mentioned the lower edge portion is ground into a rounded form as shown at 87 in Fig. 8 of the drawings. As the pen point reaches a position such as that shown in Fig. 4 of the drawings, the end of the pen is substantially normal to a tangent at the point of contact with the periphery of the grinding wheel, so that the end of the pen is made substantially square or squared.

The above operation describes the rounding of the point for the under side of the point. Later a similar rounding operation will be described for the back of the point.

At the same time as the pen is caused to move as above described to round the under part of the point, the pen and pen pintle are also given a substantially half rotation in opposite directions, or, in other words, is alternatingly rotated through an angle of substantially 180 degrees. This is effected by the rotation of the cam 44 operating against the lever 39 and causing a longitudinal reciprocation of the shaft 38 and the spiral rack 55 carried thereby, the latter effecting a rotation of the spiral gear 56 secured to the

shank 48 of the pen holding spindle. In this way the rounded portion 87 is also rounded in a transverse direction so that the effect is that of grinding a segment of a sphere on the under side of the point of the pen.

For the purpose of rounding the top of the point, the nib holder 72 may be detached from the forward end 74 of the spindle, by loosening the screw 78, and then by rotating the holder 72 one hundred and eighty degrees, the same may be again secured in place with the tapered end of the screw 77 in the groove 76 which is diametrically opposite from the groove 75 into which it was previously set. The position of the pen and pen holding means will be that shown in Fig. 5, so that the point of the nib will rest with the back part thereof upon the periphery of the grinding wheel. The device is again operated to cause the several motions of the parts as heretofore, so that the back edge corner portion 88 will now become rounded with a segmental spherical shape as previously in the case of the under part of the point. The nib is now ready to be removed and may be used immediately after the usual step of polishing.

The counterweight portion at the lower end of the arm 28 acts to bring the arm structure back into vertical position from the position shown in Fig. 4 of the drawings to that shown in Fig. 3 thereof. Usually the holder 72 is set at such a point that the end of the nib will be just above the point on the periphery of the grinding wheel to prevent the complete gravitational swinging of the pen holding spindle. The weight of the free end of this spindle is sufficient to give the necessary pressure of the nib point upon the surface of the grinding wheel to effect the desired amount of grinding.

While I have herein described and upon the drawings shown one illustrative embodiment of the invention, it is to be understood that the invention is not limited thereto but comprehends other constructions, features, arrangements of parts and details without departing from the spirit thereof.

Having thus disclosed the invention, I claim:

1. A device for finishing nibs, comprising a support, a rotary abrading member thereon, an arm pivotally supported on the support, a nib holder pivotally carried by the arm, and means for moving the arm and the holder whereby the point of the nib moves in a locus of movement in the periphery of said abrasive member.

2. A device for finishing nibs, comprising a support, a rotary abrading member thereon, an arm pivotally supported on the support, a nib holder pivotally and rotatably carried by the arm, cam means for swinging the arm and causing a rotation of said holder whereby the point of the nib may be presented to the abrasive member at different angles and be rounded.

3. In a device for finishing nibs, a nib holder, a swinging member rotatably supporting the holder at one end thereof, means for swinging said swinging member, means carried by said swinging member for giving said holder an alternate rotation when the member is being swung.

4. In a device for finishing nibs, a nib holder, a swinging member rotatably supporting the holder at one end thereof, driving means, rack and pinion means carried by said member and operatively connected to said holder, cam means operated by said driving means and operating to cause a swinging of said member and an alternating operation of said rack and pinion means whereby said holder is given an alternating rotation.

5. A device for finishing nibs, comprising a support, an abrasive member rotatably and slidably mounted on said support, driving means therefor, a nib holder, a member oscillatably mounted on said support, a cross-head pivotally mounted on said oscillatable member, said holder being rotatably mounted in said cross-head, cam means cooperating with said oscillatable member and with said abrasive member and adapted to cause an oscillation of said oscillatable member and a sliding of said abrasive member, and driving means for said cam means.

6. A device for finishing nibs, comprising a support, an abrasive member rotatably and slidably mounted on said support, driving means therefor, a nib holder, a member oscillatably mounted on said support, a cross-head pivotally mounted on said oscillatable member, said holder being rotatably mounted in said cross-head, a rack and pinion driving connection for said holder and mounted in said cross-head, rack reciprocating means pivotally mounted on said oscillatable member, cams cooperating with said oscillatable member, said reciprocating means and abrasive member, and adapted to cause an oscillation of said oscillatable member, a reciprocation of said reciprocating means and rack, and a sliding of said abrasive member, and driving means for said cams.

7. In a device for operating on nibs, a support, a nib holder on said support and movable thereon to and from an abrasive means for presenting the tip of the nib thereto, and projections on the holder and adapted to extend through alined openings in said nib for centering the same.

8. A device for operating on nibs, comprising a support, means for angularly moving the support, a carrier on the support and adapted to angularly move on the support, a nib holder rotatably carried by said carrier, and means for rotating the holder.

9. A device for operating on nibs, comprising a support, means for angularly moving

the support, a carrier on the support and adapted to angularly move on the support, a nib holder rotatably carried by said carrier, means in the carrier adapted to rotate the holder, and means associated with the holder for operating the rotating means in said carrier.

In witness whereof, I hereunto subscribe my name to this specification.

JOHN ESTABROOK WAHL.