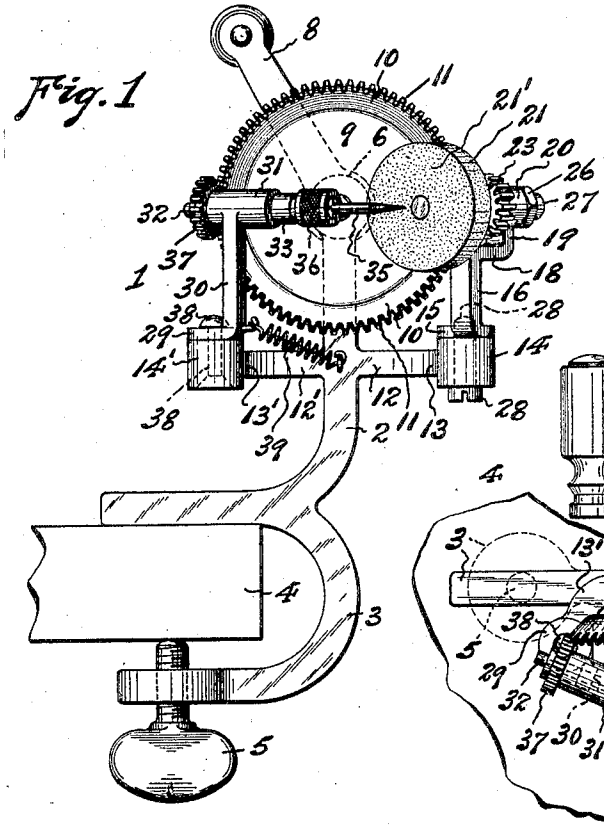
Aug. 7, 1923. 1,464,203

R. A. HUTCHINSON

NEEDLE POINTING MACHINE

Filed July 7, 1922

Fig. 1



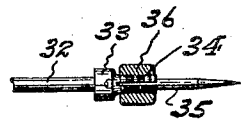


Fig. 3

Fig. 2

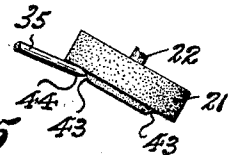


Fig. 5

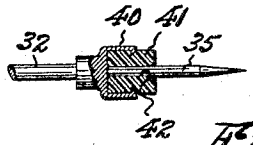


Fig. 4

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UNITED STATES PATENT OFFICE.

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NEEDLE-POINTING MACHINE.

Application filed July 7, 1922. Serial No. 573,419.

To all whom it may concern:

Be it known that I, RICHARD A. HUTCHINSON, citizen of the United States, residing at Kenilworth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Needle-Pointing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to characters of reference marked thereon, which form a part of this specification.

The present invention relates, generally, to an improved construction of pointing machine; and the invention has reference, more particularly, to a novel machine for sharpening pointed articles, such as phonograph needles, etc.

The invention has for its principal object to provide a novel and very simple means for driving a rotatable grinding member and a needle chuck spindle in mutual relation and in opposite directions, together with a novel means and method of adjusting the grinding member and needle chuck spindle relative to each other to secure the desired taper of finished point; and, furthermore, to provide a novel means for mounting the needle chuck spindle so that tension may be applied thereto to compel the same to press the work operatively against the grinding member.

The invention has for a further object to provide a machine in which the parts have been reduced to a minimum so as to render the same compact, cheap to produce, and little likely to get out of order, and yet very efficient in the performance of the work for which it is designed.

Other objects of the present invention, not at this time more particularly enumerated, will be clearly understood from the following detailed description of the same.

With the various objects of the invention in view, the same consists, primarily in the novel construction of pointing machine hereinafter set forth; and the invention consists, furthermore, in the novel arrangements and combinations of the various devices and parts, as well as in the details of the construction of the same, all of which will be more fully described in the following specification, and then embodied in the appended claims.

The invention is clearly illustrated in the accompanying drawings, in which:—

Figure 1 is a front elevation of the novel pointing machine, made according to and embodying the principles of the present invention. Figure 2 is a top or plan view of the same. Figure 3 is a detail view of the needle holding chuck of the chuck spindle. Figure 4 is a detail view of a modified form of the needle holding chuck. Figure 5 is a detail view of a modified form of grinding member for use with the pointing machine.

Similar characters of reference are employed in all of the above described views, to indicate corresponding parts.

Referring now to said drawings, the reference-character 1 indicates the complete pointing machine, made according to and embodying the principles of the present invention, the same comprising, a suitable supporting standard 2 provided at its lower end with an open yoke-portion 3 adapted to embrace the edge of a bench or table 4 for the purpose of securing the machine in place ready to be operated. The free end of the lower arm of said yoke-portion 3 is provided with a thumb-screw 5, for engaging the bench or table 4 to clamp the said yoke-portion in fixed relation thereto.

The upper free end of said supporting standard 2 is provided with a horizontal bearing portion 6, in which is rotatably mounted a shaft 7, upon the rearward end of which is fixed a suitable crank-handle 8 for rotating said shaft, and upon the forward end of which is fixed a driving gear 9. Said driving gear 9 is of peculiar construction or design, in that it comprises a comparatively thin dish-shaped main body providing an outwardly and forwardly inclined or flared annular flange 10, in the periphery of which are cut the gear teeth 11, so that the latter project angularly outward.

Said supporting standard 2 is provided, below the mounting of said driving gear 9, with a pair of oppositely and laterally extending arms 12 and 12′, having forwardly curved free ends 13 and 13′ terminating in

vertical bosses 14 and 14'. The vertical axes of said bosses are alined with gear teeth 11 of said driving gear 9.

Supported upon said boss 14 by means of its foot-piece 15 is an outwardly off-set vertical carrying post 16 provided at its upper end with a horizontal bearing member 17. Integrally connected with said post 16 is a rearwardly projecting bracket arm 18 having an upwardly turned free end 19 terminating in a boss 20 longitudinally alined with and behind said bearing member 17. The reference-character 21 indicates a grinding wheel provided with an arbor 22 rotatably journaled in said bearing member 17, said arbor 22 being provided with a spur gear 23 operatively meshing with the gear teeth 11 of said driving gear 9. Screwing through said boss 20 is the threaded shank 24 of a conical thrust bearing 25 which engages the rear end of said arbor 22. Arranged upon said shank 24 in back of said boss 20 is a lock-nut 26 for locking said conical thrust bearing in desired adjusted position. Said shank 24 is also provided with the slotted head 27 for manipulating said shank and thrust bearing. A fastening screw 28 adapted to extend vertically upward through said boss 14 screws into said foot-piece 15 of said carrying post 16 to lock the same in fixed adjustment to position said grinding wheel to properly dispose its grinding face 21'. Since the supporting post 16 carrying said grinding wheel and its gear is adjustable about an axis alined with the projection of said teeth 11 of the driving gear 9, it follows that a substantial variation of the angular disposition of the grinding wheel may be attained without danger of disturbing the operative meshing and driven relation of said spur gear 23 with the driving gear 9.

Supported upon said boss 14' by means of its foot-piece 29 is an outwardly off-set vertical carrying post 30 provided at its upper end with a horizontal bearing member 31. Rotatably mounted in said bearing member 31 is a spindle 32 provided at its forward end with a chuck member 33 comprising the externally threaded split socket sleeve 34 providing jaws for gripping the shank of the needle 35 to be pointed. The said sleeve 34 receives the nut-piece 36, which is adapted, when screwed home thereon to close said jaws about the needle shank with gripping effect. Secured upon the rear end of said spindle 32 is a spur gear 37 which meshes with the teeth 11 of said driving gear 9. The foot-piece 29 of said carrying post 30 is pivoted to said boss 14' by means of a pivot pin or stud 38 extending axially through said boss and through said foot-piece. As will be understood from an inspection of the drawings, the pivotal movement of said carrying post and associated parts, being about an axis alined with the projection of said teeth 11 of said driving gear 9, it follows that a substantial swinging movement of the parts may be effected without disturbing the operative meshing and driven relation of said spur gear 37 with the driving gear 9.

As will be understood from an inspection of the drawings, the dish-shaped driving gear permits a mounting of the grinding wheel arbor and of the needle chuck spindle in such a manner that they mutually incline toward each other in front of said driving gear. Consequently the face of the grinding wheel is properly disposed to be engaged operatively by the point of a needle 35 projecting outwardly from the needle chuck. The angle of the disposition of the face of the grinding wheel relative to the longitudinal axis of the needle 35 may be predetermined by the swinging adjustment of the carrying post 16 in order to so present the face of the grinding wheel relative to the needle as to produce at the point of the latter the desired degree of taper. Slight adjustments of the grinding wheel face relative to the taper of a needle point may also be independently made by setting out or retracting the grinding wheel by longitudinally adjusting the arbor of the grinding wheel by means of the adjustable thrust bearing 25. The carrying post 30 supporting the mounting of the needle chuck spindle being free to pivot or swing on its connection with the supporting frame work, it follows that by placing the same under a pulling tension to swing the same inward, the needle point 35 will be moved against the face of the grinding wheel, and will be yieldingly pressed against the same to assure the proper attrition effects of the grinding wheel upon the needle. To this end a pull spring 39 is connected with said carrying post 30 and anchored to the framework of the device, so as to exert an inwardly swinging pull on said carrying post, and consequently upon the parts associated therewith, to pull the needle point against the face of the grinding wheel.

Since the chuck spindle gear engages the driving gear on one side and the grinding wheel arbor gear engages said driving gear on the opposite side, it follows that the needle 35 will be rotated in one direction, while the grinding wheel is rotated in the opposite direction, thereby producing the best grinding effect.

It will also be readily understood that, since the chuck spindle is mounted so as to be capable of a swinging movement in either direction, it is very easy to swing the chuck outwardly to carry the needle away from the face of the grinding wheel so that the chuck may be released, the sharpened needle removed, and a needle to be operated upon re-

placed in and secured by the chuck, so that when the spindle is released the spring 39 will again swing the same inwardly to position the new needle in operative engagement with and relation to the grinding wheel.

In place of the chuck means above described, I have found, that a satisfactory chuck arrangement is provided by the construction illustrated in Figure 4 of the drawings. In this construction I secure to the end of the chuck spindle 32, by means of an embracing socket member 40, or in any other suitable manner, a soft rubber chuck body 41 provided with a central longitudinal perforation 42, adapted to receive the shank butt of the needle 35, and to frictionally grip the same so as to assure its rotation against the face of the grinding wheel when presented thereto. This modified form of chuck permits of easy manipulation, since it merely requires that the butt of the needle be pushed thereinto or withdrawn therefrom without necessity of manipulating movable chuck parts.

Referring to Figure 5 of the drawings, I have illustrated therein a modified form of grinding wheel face. In this construction the grinding wheel 21 is provided with an annularly concave face-portion 43, which when applied to the needle point produces a convex taper 44 instead of a straight taper.

From the above description the construction as well as the principles of operation of my novel pointing machine will be clear without necessity of going into further detail. It will be apparent, that the machine is made up of a very few parts, so related as to be easily adjustable to produce the desired taper of the point ground thereby, and involving little mechanism likely to get out of order.

I am aware that some changes may be made in the several arrangements and combinations of the devices and parts, as well as in the details of the construction of the same, without departing from the scope of the present invention as set forth in the foregoing specification, and as defined in the following claims. Hence, I do not limit my invention to the exact arrangements and combinations of the several devices and parts as described in the said specification, nor do I confine myself to the exact details of the construction of said parts as illustrated in the accompanying drawings.

I claim:—

1. In a device of the kind described, a supporting frame, a dish-shaped driving gear rotatably mounted upon said frame, a carrying means supported upon said frame so as to be capable of a swinging adjustment in a horizontal plane, a grinding wheel provided with an arbor journaled in said carrying means, a spur gear on said arbor in meshed engagement with one side of said driving gear, a second carrying means pivotally supported upon said frame to swing in a horizontal plane, a chuck spindle journaled in said second carrying means, a chuck means connected with said spindle for supporting and rotating an article to be pointed, a spur gear on said spindle in meshed engagement with the opposite side of said driving gear, and spring means for swinging said second carrying means to press said article to be pointed in operative relation to said grinding wheel.

2. In a device of the kind described, a supporting frame, a dish-shaped driving gear rotatably mounted upon said frame, means for rotating said driving gear, oppositely and laterally extending arms connected with said frame below said driving gear, said arms respectively terminating in vertical bosses centrally alined beneath the outwardly inclined teeth of said driving gear at opposite sides of the latter, a carrying means supported upon the vertical boss of one arm so as to be capable of a swinging adjustment in a horizontal plane, a grinding wheel provided with an arbor journaled in said carrying means, a spur gear on said arbor in meshed engagement with said driving gear, a second carrying means pivotally supported upon the vertical boss of the opposite arm to swing in a horizontal plane, a chuck spindle journaled in said second carrying means, a chuck means connected with said spindle for supporting and rotating an article to be pointed, a spur gear on said spindle in meshed engagement with said driving gear, and spring means for swinging said second carrying means to press said article to be pointed in operative relation to said grinding wheel.

3. In a device of the kind described, a supporting frame, a dish-shaped driving gear rotatably mounted upon said frame, means for rotating said driving gear, oppositely and laterally extending arms connected with said frame below said driving gear, said arms respectively terminating in vertical bosses centrally alined beneath the outwardly inclined teeth of said driving gear at opposite sides of the latter, a carrying means supported upon the vertical boss of one arm so as to be capable of a swinging adjustment in a horizontal plane, a grinding wheel provided with an arbor journaled in said carrying means, a spur gear on said arbor in meshed engagement with said driving gear, a second carrying means pivotally supported upon the vertical boss of the opposite arm to swing in a horizontal plane, a chuck spindle journaled

in said second carrying means, a chuck means connected with said spindle for supporting and rotating an article to be pointed, a spur gear on said spindle in meshed engagement with said driving gear, spring means for swinging said second carrying means to press said article to be pointed in operative relation to said grinding wheel, and clamp means connected with said frame for securing the same to a table or the like.

4. In a device of the kind described, a supporting frame, a dish-shaped driving gear rotatably mounted upon said frame, a carrying means supported upon said frame so as to be capable of a swinging adjustment in a horizontal plane, a grinding wheel provided with an arbor journaled in said carrying means, a spur gear on said arbor in meshed engagement with one side of said driving gear, a second carrying means pivotally supported upon said frame to swing in a horizontal plane, a chuck spindle journaled in said second carrying means, a chuck means connected with said spindle for supporting and rotating an article to be pointed, a spur gear on said spindle in meshed engagement with the opposite side of said driving gear, spring means for swinging said second carrying means to press said article to be pointed in operative relation to said grinding wheel, and clamp means connected with said frame for securing the same to a table or the like.

5. In a device of the kind described, a supporting frame, a dish-shaped driving gear rotatably mounted upon said frame, means for rotating said driving gear, a grinding wheel having an arbor, a spur gear on said arbor meshing with one side of said driving gear, means connected with said frame for supporting said arbor to project said grinding wheel obliquely in front of said driving gear, a chuck spindle, a needle holding chuck means on said spindle, a spur gear on said spindle meshing with the opposite side of said driving gear, a swing means supported by said frame for mounting said spindle, and spring means for swinging said swing means to press a needle held by said chuck means in operative engagement with said grinding wheel.

6. In a device of the kind described, a supporting frame, a dish-shaped driving gear rotatably mounted upon said frame, means for rotating said driving gear, a grinding wheel having an arbor, a spur gear on said arbor meshing with one side of said driving gear, means connected with said frame for supporting said arbor to project said grinding wheel obliquely in front of said driving gear, a chuck spindle, a needle holding chuck means on said spindle, a spur gear on said spindle meshing with the opposite side of said driving gear, a swing means supported by said frame for mounting said spindle, spring means for swinging said swing means to press a needle held by said chuck means in operative engagement with said grinding wheel, and clamp means connected with said frame for securing the same to a table or the like.

7. In a device of the kind described, a supporting frame, a grinding wheel having an arbor, a spur-gear on said arbor, a bearing standard pivotally connected with said frame for journaling said arbor, means for locking said bearing standard to determine the angular adjustment of said grinding wheel, a chuck spindle for supporting an article to be pointed, a spur gear on said chuck-spindle, a swinging means connected with said frame for journaling said chuck spindle, spring means for moving said swinging means to press the article to be pointed in operative engagement with said grinding wheel, and a dish-shaped driving gear rotatably mounted on said frame to mesh at opposite sides with said respective spur gears, and means for rotating said driving gear.

In testimony that I claim the invention set forth above I have hereunto set my hand this 29th day of June, 1922.

RICHARD A. HUTCHINSON.

Witnesses:

GEORGE D. RICHARDS,
ROBT. E. WILSON.