R. S. GREEN.

BLADE SHARPENING MACHINE.

APPLICATION FILED JULY 9, 1909.

950,284.

Patented Feb. 22, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

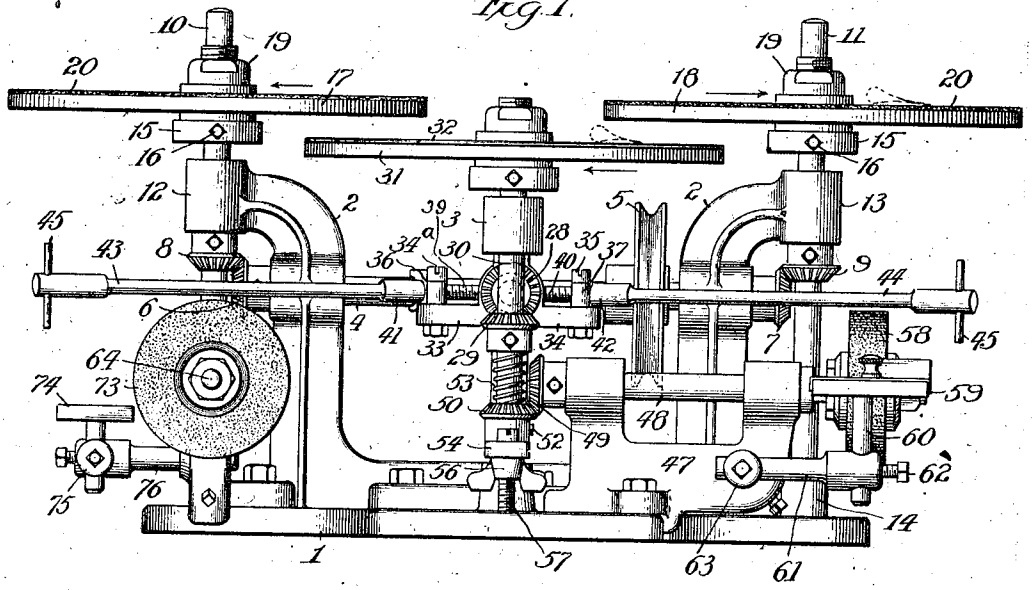
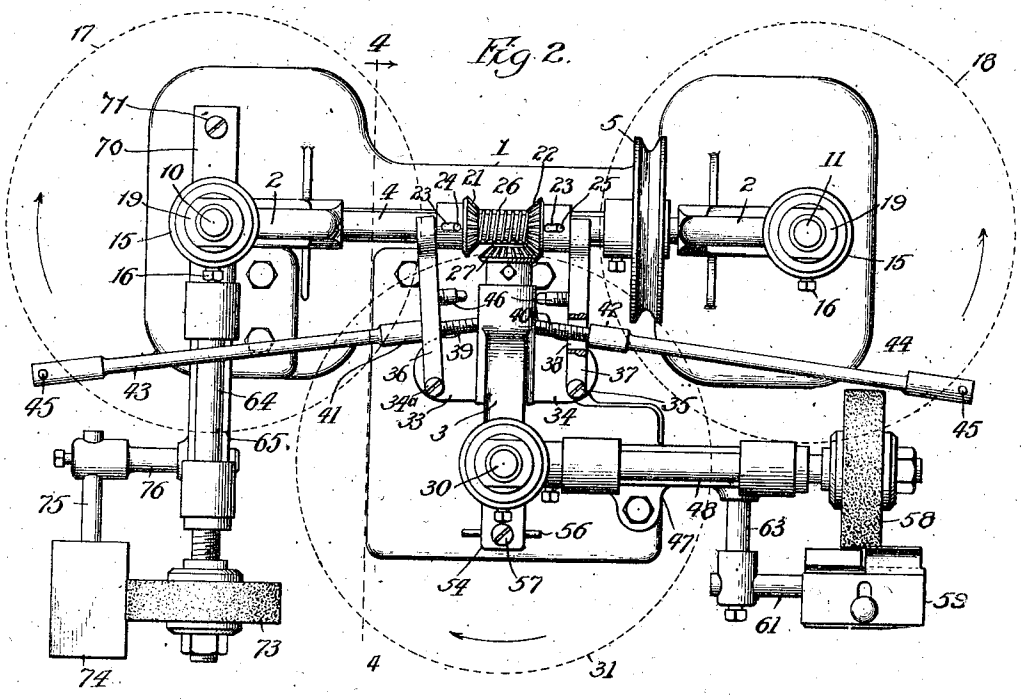


Fig. 2.



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2 SHEETS—SHEET 2.

Fig 3.

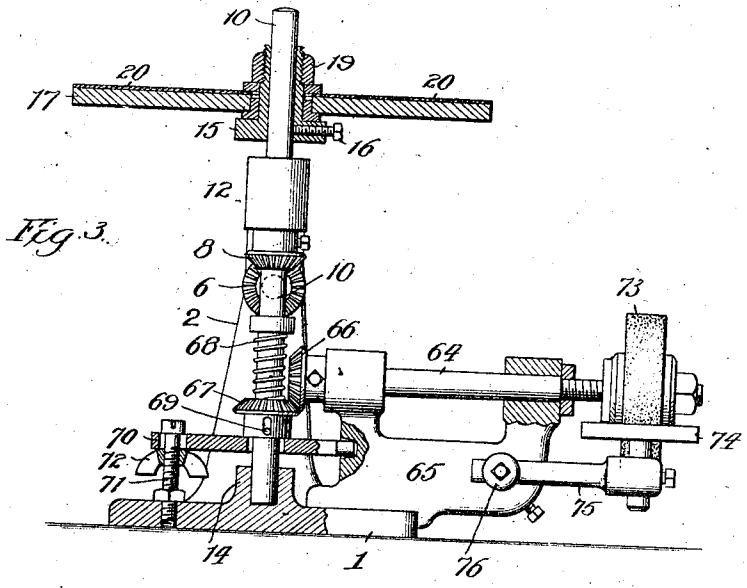
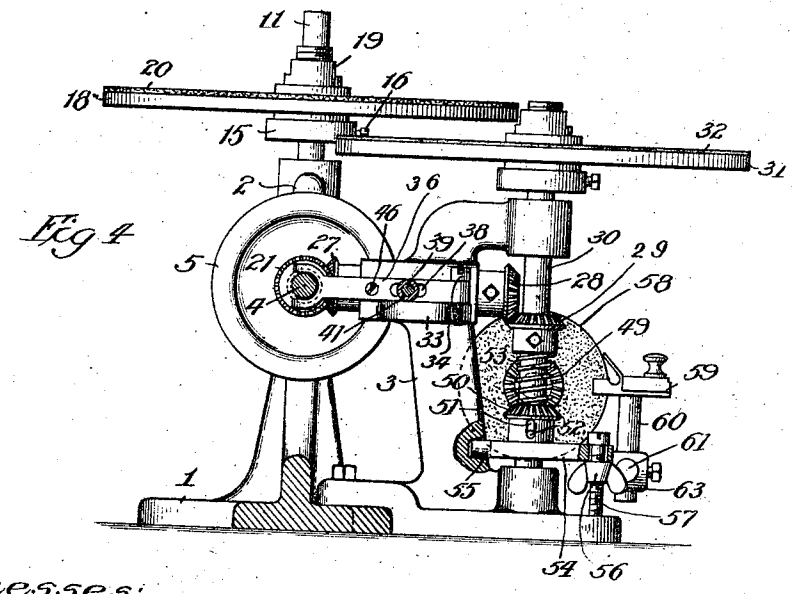


Fig 4



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UNITED STATES PATENT OFFICE.

RAPHAEL S. GREEN, OF CHICAGO, ILLINOIS.

BLADE-SHARPENING MACHINE.

950,284. Specification of Letters Patent. Patented Feb. 22, 1910.

Application filed July 9, 1909. Serial No. 506,770.

To all whom it may concern:

Be it known that I, RAPHAEL S. GREEN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Blade-Sharpening Machines, of which the following is a description, reference being had to the accompanying drawings, forming a part of this specification, in which corresponding characters of reference in the different figures indicate like parts.

The object of my invention is to provide a simple and efficient grinding machine for grinding and honing razors, knives, scissors and other edged tools; my purpose being to so combine the elements thereof that those which are to be used in successive order may not only be arranged in close proximity to each other, but in a predetermined order and provided with shifting means so that the direction of motion of an acting part from which a tool is to be shifted may conform to that of the one to which it is to be transferred, thereby saving time and simplifying the work while eliminating the danger of injury to the operator, the machine or the parts acted upon, all of which is hereinafter described and distinctly pointed out in the claims.

In the drawings, Figure 1 is a front elevation of a machine embodying the features of my invention, Fig. 2 is a plan view, without the disks, Fig. 3 is an end elevation, portions of which are broken away and sectioned to show features of the working parts, and Fig. 4 is a sectional view taken upon the line 4—4, Fig. 2, viewed in the direction of the arrow there shown.

Referring to the drawings, 1 represents the base of the machine which is provided with upright supports or brackets 2, 2 and 3, in the former of which is journaled a main driving shaft 4 having a driving pulley 5 mounted thereon and adapted to be connected to any suitable source of power. Beveled gears 6, 7, better shown in Fig. 1, are mounted upon the ends of the shaft 4 and are arranged to mesh with like gears 8 and 9 respectively upon vertical shafts 10 and 11, which are journaled in heads 12 and 13 upon the uprights 2, as well as in suitable bearings in the base, one of which, 14, is shown in Figs. 1 and 3. Sleeves 15 adjustably secured by means of set-screws 16 are mounted upon the shafts 10 and 11 and serve as supports for horizontally arranged disks 17 and 18, which are detachably secured in place by means of suitable washers and nuts 19, said disks consisting of metal plates provided with a facing 20 of leather, or other suitable stropping material. The disks 17 and 18 are intended to run in opposite directions, as indicated by the arrows shown in Figs. 1 and 2, for the purpose hereinafter stated.

Mounted upon the shaft 4 are beveled gears 21 and 22, each of which is provided with a hub having therein a slot 23. Pins 24, 25 are projected through the slots and into the shaft. The gears and hubs are free to be moved longitudinally upon the shaft, but are caused to rotate therewith by means of said pins. A coiled spring 26 is located upon said shaft between the gears which it serves to separate so as to normally hold the inner ends of the slots against the pins. A short horizontal shaft which is mounted in bearings in the upright 3, but is hidden thereby, is arranged in the same plane with but at right angles to the shaft 4, and has beveled gears 27, 28, Figs. 1, 2 and 4, mounted upon its ends respectively, the former of which is in operative proximity to, but normally separated from the gears 21 and 22. The gear 28 meshes with a like gear 29, upon an upright shaft 30 upon the upper end of which is detachably secured a disk 31 having an abrading material 32 upon its surface adapted for honing purposes. The manner of securing the disk to the shaft 30 is the same as that by which the other disks are secured and need not be described.

Laterally extended arms 33, 34, are formed upon opposite sides of the upright 3, upon which are pivoted at 34^a, 35 respectively, lever arms 36, 37, the rear ends of which are bifurcated to straddle the shaft 4 and bear against the outer ends of the hubs of the beveled gears 21 and 22. The lever arms 36, 37 are provided with elongated bores or slots 38, Figs. 2 and 4, for the reception of screws 39 and 40, which are attached to and project laterally from the upright support 3. Nuts 41, 42 are in engagement with said screws and are provided with operating rods 43, 44, the outer ends of which are provided with cross pins 45 to enable them to be readily operated. Adjusting screws 46, Figs. 2 and

4, serve to limit the inward movement of the lower arms 36, 37. Upon turning the rod 44 to the right, the nut 42 is caused to move the lever arm 37 inwardly until the screw 46 abuts against the upright and limits its further movement. This causes the gear 22 to be moved against the action of the spring 26 into engagement with the gear 27, from which it is normally disengaged. The direction of rotation of the honing disk 31 is intended to be reversed at will to conform to the requirements of the blade operated upon, while that of the stropping disks is constant, but in opposite directions with respect to each other. It is well known that in honing a razor or other blade, it is desirable to so hold the blade upon the hone that its edge will be opposed to the direction of movement of the hone. The reverse of this, however, is required in stropping. If the honing and stropping disks are caused to run in the same direction, then it becomes necessary not only to reverse the direction of the edge of the blade in transferring it from one disk to another, but to reverse the direction of movement of the disks to conform to the edge of the blade. This is liable to cause confusion and may result in injury to the blade, the machine or the operator, if not to all three. My arrangement and method of operation enables this difficulty to be overcome. Assuming the disks 17 and 18, to be running in the directions indicated by the arrows and the gear 27 to be in mesh with the gear 22, then the honing disk will be caused to rotate in a direction opposite to that of the disk 18. The blade being honed would then be held in the position indicated in dotted lines in Fig. 1, in which the disk would act against its edge. When sufficiently honed upon one side it is then transferred to the stropping disk 18 without being turned over, and as that disk is moving in an opposite direction, its movement will be away from the edge. When it becomes necessary to treat the other side of the blade, the gear 22 is disengaged by unscrewing the nut 42 and the gear 21, thrown into engagement through the action of the shifting rod 43, which causes the movement of the disk 31 to be reversed, thereby enabling the same operation to be repeated in conjunction with the disk 17. I have found in practice that a considerable saving of time is effected by means of this construction, while the danger of accident is avoided.

It is of advantage that not only the honing and stropping, but the "hollow" and other grinding should be accomplished with the same machine. This may be done by means of the following described mechanism. Supported in bearings in a bracket 47, Figs. 1 and 2, is a horizontal shaft 48, having a beveled gear 49 upon one end, which is adapted to be engaged by a like gear 50 upon the shaft 30. The gear 50 is provided with a hub having a slot 51 for the reception of a pin 52, Figs. 1 and 4, which is secured to the shaft. This causes the gear to rotate with the shaft while permitting a limited vertical movement. A coiled spring 53 serves normally to hold the gear 50 out of engagement with its fellow. A lever arm 54 has one end supported in a bore 55, Fig. 4, in the upright 3, while the outer end rests upon a thumb-nut 56 upon a screw 57, which is extended loosely through a bore in the end of said arm and is tapped into the base. The shaft 30 is also loosely extended through a bore in said arm so that the latter may serve as a support for the gear 50. By means of the thumb-nut, the lever-arm may be raised or lowered so as to throw the gears 49 and 50 into and out of engagement. A grinding wheel 58 is mounted upon the outer end of the shaft 48. A clamp 59 for clamping a razor blade is mounted upon a vertical shaft 60, adjustably secured to a horizontal arm 61 by means of a set-screw 62, Fig. 1. The arm 61 is in like manner secured to the outer end of an arm 63, which is in turn attached rigidly to the bracket 47. This construction enables the clamp to be adjusted to any desired position with reference to the grinding wheel 58.

A shaft 64, Figs. 1 to 3 inclusive, is mounted in bearings in a bracket 65. Said shaft is provided with a gear 66 adapted to be engaged by a gear 67 upon the shaft 10, which is held normally out of engagement therewith by means of a coiled spring 68. The gear 67 is provided with a slotted hub, as shown, and is connected to the shaft by means of a pin 69 projecting therethrough, and is thrown into and out of gear by means of a lever arm 70, screw 71 and nut 72, corresponding in construction to that just described for controlling the gear 50. A grinding wheel 73 is detachably mounted upon the outer end of the shaft and is provided with a tool-rest 74, adjustably supported upon the arms 75 and 76 in the manner corresponding to that of the clamp 59. This mechanism is especially designed for the grinding of scissors or other tools having a beveled edge.

It will be seen from the foregoing that the operations of grinding, honing and stropping may alternately be carried on with the same machine, and that the changes from one operation to another may be made with a minimum expenditure of time and effort, while the chances for accident are also reduced to a minimum.

Having thus described my invention, I claim:

1. In a machine of the class described, the combination with a honing disk arranged in a horizontal plane, a stropping disk ar-

ranged in a different horizontal plane, means for reversing the direction of rotation of one of said disks, and means for causing the other to rotate continuously in a given direction.

2. In a machine of the class described, the combination with a honing disk and a stropping disk arranged to overlap each other, means for continuously rotating one in a given direction, and means for reversing the direction of rotation of the other.

3. In a machine of the class described, the combination of two stropping disks located in a horizontal plane, means for rotating the same continuously in opposite directions, a honing disk arranged upon a lower level to overlap said stropping disks, and means for reversing the direction of rotation of said honing disk.

4. In a machine of the class described, the combination of two stropping disks, means for continuously rotating the same in opposite directions, a honing disk located upon a lower level, said disk being arranged to overlap the others, means for throwing said honing disk into and out of action, and means for changing the direction of rotation thereof.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses, this seventh day of July 1909.

RAPHAEL S. GREEN.

Witnesses:
D. H. FLETCHER,
HARRY I. CROMER.