Nov. 25, 1941. F. E. BROBERG 2,264,065

SHARPENING DEVICE

Filed June 22, 1939

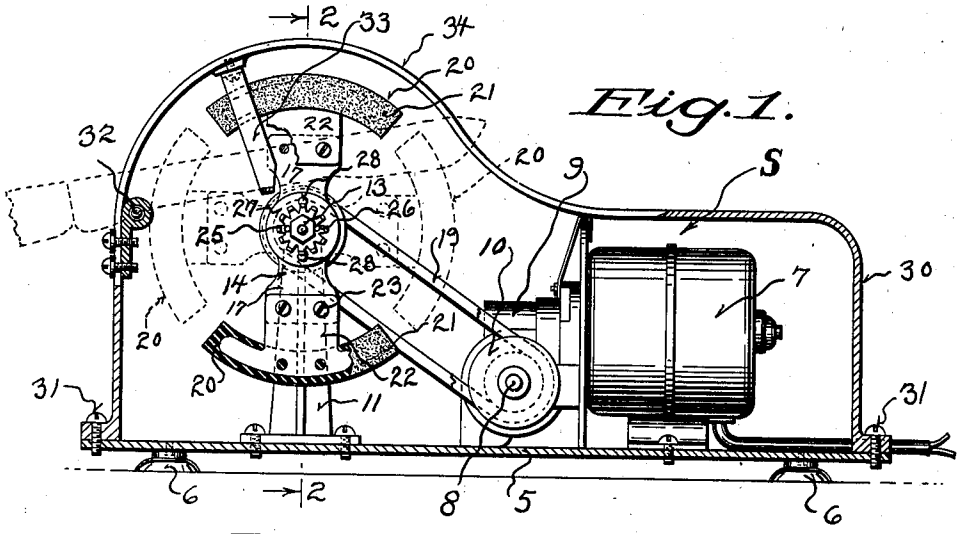


Fig. 1.

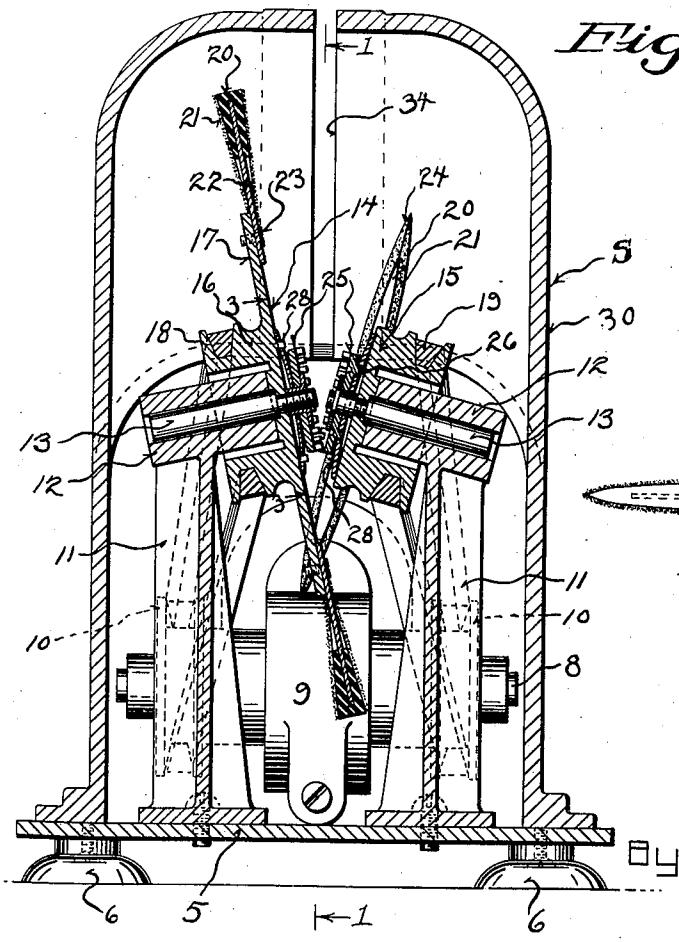


Fig. 2.

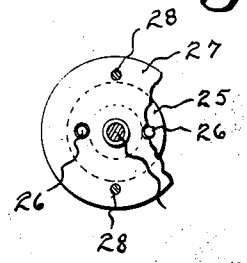


Fig. 3.

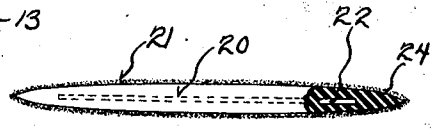


Fig. 4.

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UNITED STATES PATENT OFFICE

2,264,065

SHARPENING DEVICE

Fred E. Broberg, Racine, Wis.

Application June 22, 1939, Serial No. 280,504

3 Claims. (Cl. 51—116)

This invention appertains to sharpening devices and is an improvement over my prior Patent No. 2,019,471, issued to me October 29, 1935.

In my mentioned patent, I illustrated rotatable abrasive wiper members arranged at an angle to one another and to a knife guide slot in a protecting housing, with the members driven simultaneously from a common drive shaft.

One of the primary objects of my invention is to provide improved wiper members for the sharpening device, whereby to insure the proper and continuous engagement of said members with a blade throughout the entire length of the blade, and substantially throughout the entire length of the wiper members.

Another salient object of my invention is to provide means for forming the wiper pads of the wiper members, whereby the pads themselves will be of a resilient or cushion construction, so as to engage the blade to be sharpened with the proper effect, without injury to the blade and the abrasive.

A further object of my invention is to provide means for connecting the cushion wiper pads with arms stamped from spring material, whereby said arms will resiliently hold the pads against the blade during the rotation of the wiper members.

A further important object of my invention is to provide gears for connecting the rotatable wiping members together, whereby to insure the operation of said members in proper timed relation during the actuation thereof.

A still further object of my invention is to provide novel means for mounting the gears on the wiper members, whereby a certain movement between the intermeshing gears is permitted, so as to eliminate noise and chattering of the gears incidental to the intermeshing of the teeth thereof.

With these and other objects in view, the invention consists in the novel construction, arrangement, and formation of parts, as will be hereinafter more specifically described, claimed, and illustrated in the accompanying drawing, in which drawing:

Figure 1 is a central, longitudinal, sectional view through my improved sharpening device, taken on the line 1—1 of Figure 2, looking in the direction of the arrows.

Figure 2 is a transverse, sectional view through the improved sharpening device, taken on the line 2—2 of Figure 1, looking in the direction of the arrows, said figure being on a larger scale than Figure 1.

Figure 3 is a fragmentary, detail view illustrating the means for connecting a gear with its sharpening member, the view being taken on line 3—3 of Figure 2.

Figure 4 is a top plan view of one of the cushion abrasive wiper pads, parts of the view being shown broken away and in section.

Referring to the drawing in detail, wherein similar reference characters designate corresponding parts throughout the several views, the letter S generally indicates my improved sharpening device, and the same can include a base plate 5. This base plate 5 can be formed with supporting feet, and in the present instance I have provided the base plate with vacuum cup members 6, so as to prevent creeping of the base plate over a surface on which it is placed during the sharpening of implements.

Rigidly secured to the base plate 5 is an electric drive motor 7 of the desired fractional horsepower, and the motor drives an operating shaft 8 through the medium of reduction gearing 9. The shaft 8 is disposed in a horizontal plane and extends transversely across the base plate 5, and this shaft has keyed or otherwise secured thereto on opposite sides of the reduction gearing, drive pulley wheels 10.

Rigidly secured to the base plate 5 in advance of the motor 7 is a pair of upright supporting standards 11, which have formed on or secured to their upper ends, bearing sleeves 12. These bearing sleeves 12 are arranged at an angle to one another and to the horizontal. The bearings also preferably incline upwardly and rearwardly. Shafts 13 are rotatably mounted in said bearings, and these shafts have keyed or otherwise secured thereto the wiper members 14 and 15.

Each of the wiper members includes a hub 16 and radially extending spokes 17. In the present instance, the spokes are shown to be two in number on each hub, and the same are diametrically disposed relative to one another. The hub 16 of each member has formed thereon or secured thereto a pulley wheel 18, and the pulley wheels 18 and 10 are operatively connected together by pulley belts 19, preferably of the V-type.

The sharpening members 14 and 15 have the spokes 17 thereof carrying the wiper pads 20. These wiper pads are formed from resilient material, such as rubber, and are of a novel shape, as will be hereinafter more specifically described. I lay great stress on the fact that the pads 20 are formed from cushioning material, in that the pads can give and conform to the particular configuration of the blade being sharpened.

The opposite sides of the rubber cushion pad

20 has secured thereto in any preferred way, abrasive sheets 21. Molded in the pads are spring steel shanks 22, and these shanks 22 are detachably connected to the spokes 17, such as by the use of fastening elements 23. By referring to Figure 1, it can be seen that the pads are of an arcuate form in side elevation, and the spokes 17 of one sharpening member are disposed between the spokes of the other sharpening member. As previously stated, one of the important features of my invention is the particular shape of the cushion pads 20.

By referring to Figure 4, it can be seen that the pads have their greatest thickness at their central portions, and the same gradually taper toward their opposite ends, as at 24. Likewise, the pads taper from their outer edges toward their inner edges, as can be readily seen from the cross section of the pads shown in Figure 2.

As the shafts 13 are driven from the pulley belts 19, the sharpening members 14 and 15 will be simultaneously driven. I prefer, however, to provide a positive means for insuring the rotation of the sharpening members in proper timed relation. This means consists of intermeshing crown gears 25. To eliminate chattering of the gears and noise incident to the intermeshing thereof, the gears are mounted in a novel manner. As shown, the gears have struck out therefrom lugs 26, which are fitted in openings of a slightly greater size in resilient concavo-convex disc washers 27. As the openings are of a slightly greater size than the lugs 26, slight axial movement of the gears is permitted relative to one another and to their shaft. The discs 27 are secured by means of pins 28 formed on or secured to the hubs 16 of the sharpening members extending through openings in said washer discs. Due to this mounting, the gears are not only free for slight relative rotative movement, but also can give longitudinally of their shafts.

The motor 7 and other operating parts of the device are preferably enclosed within a protecting housing 30, and this housing can be detachably secured to the base 5 by means of removable fastening elements, such as screws 31. The protecting housing of casing 30 is formed with a centrally disposed, longitudinally extending knife-guide slot 34, whereby a blade can be placed in the housing between the wiping members. The housing 30 carries a guide 32 for the knife blade, and this guide may consist of balls, so as to prevent injury to the blade during the movement in the blade back and forth in the casing.

To prevent the blade from being drawn into the intermeshing gears 25, the housing 30 carries a depending U-shaped stirrup 33, which extends between the sharpening members.

The device operates in the same manner as the device in my mentioned patent, and due to the shape of the pads 20, the pads will conform to the inclined side faces of a knife blade, and as each pad is tapered toward its opposite ends, the same will easily ride into and out of engagement with the knife blade. In view of the fact that the pads are formed from cushioning material, the abrasive strips will be held firmly against the knife and will conform somewhat to the configuration of the knife. Likewise, the resilient shanks 22 effectively hold the pads against the knife blade.

Changes in details may be made without departing from the spirit or the scope of my invention, what I claim as new is:

1. In a sharpening device for blades, a rotatable sharpening member including an arcuate pad, said pad having a body formed from cushioning material, and abrasive strips secured to opposite sides of the body, said body being tapered from its center toward its opposite ends, and having its opposite faces inclining inwardly from its outer longitudinal edges toward its inner longitudinal edges.

2. In a sharpening device for blades, a pair of rotatable shafts disposed at an angle relative to one another, means for independently rotating the shafts from a common drive source, sharpening members including wiper pads carried by each shaft, compressible concavo-convex discs carried by the facing portions of the sharpening members, intermeshing timing gears, and means mounting the intermeshing timing gears on the compressible concavo-convex disc for limited turning movement.

3. In a sharpening device for blades, a rotatable sharpening member including, a radially extending spoke, an arcuate pad resiliently secured to the outer end of the spoke and extending transversely across the spoke with its ends disposed on opposite sides of the spoke, said pad being of material thickness and formed from cushioning material, and an abrasive strip secured to the active face of the material, said pad being tapered from its center toward its opposite ends.

FRED E. BROBERG.