Sept. 19, 1950 G. A. GILLEN 2,522,942

ELECTRIC KNIFE SHARPENER

Filed Oct. 8, 1948 2 Sheets-Sheet 1

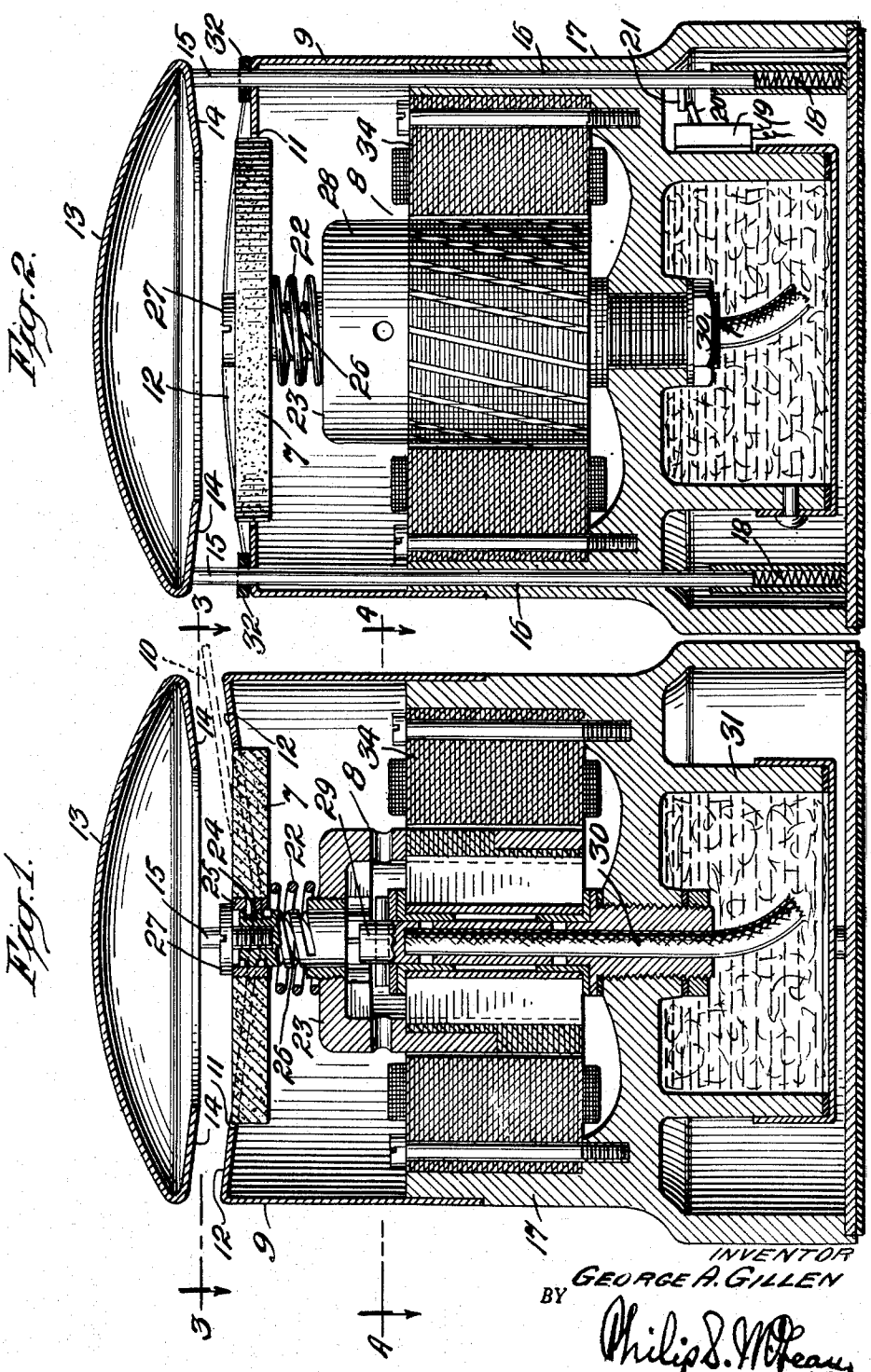


Fig. 2.

Fig. 1.

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Fig. 6.

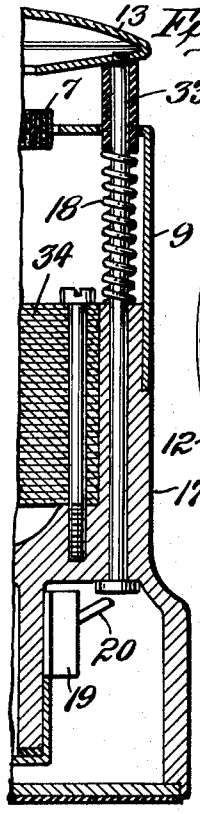


Fig. 3.

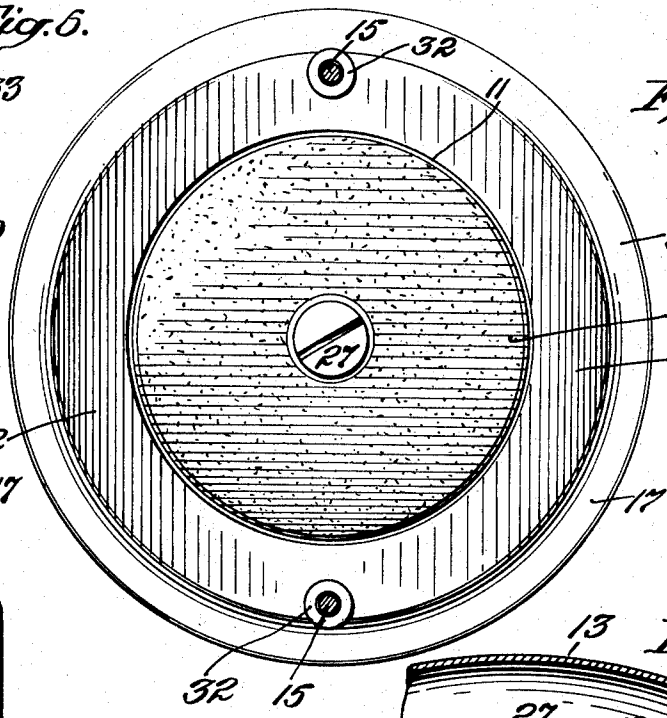


Fig. 5.

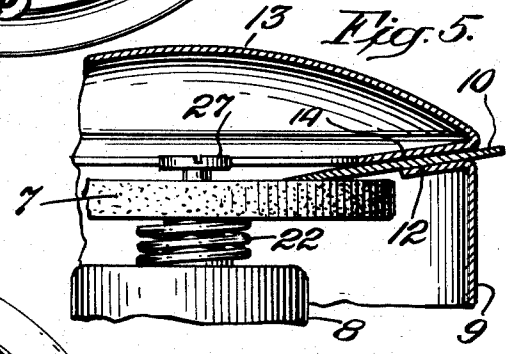
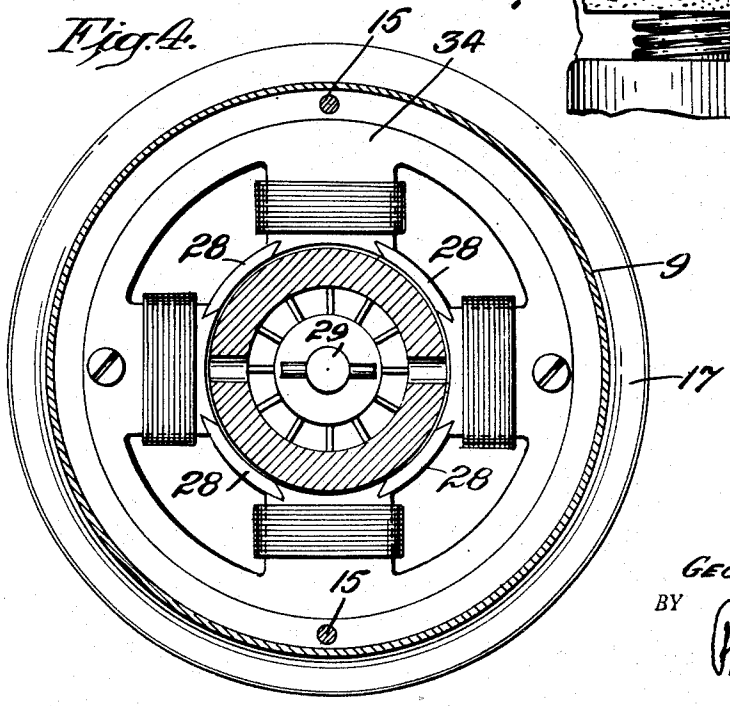


Fig. 4.



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ELECTRIC KNIFE SHARPENER

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6 Claims. (Cl. 51—128)

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The invention herein disclosed is a power operated knife sharpener.

Particular objects of the invention are to provide a practical and efficient knife sharpener operable by small electric motor which will be easy to use and which will automatically put a proper cutting edge on a knife or other such implement.

Special objects of the invention are to provide the machine in a compact, neat structure which will be entirely safe to use and in which moving parts will be guarded to prevent possibly injury through careless handling or the like.

Other important objects of the invention are to provide a machine of the character indicated which will consist of but few parts, be of simple construction and of low cost and which will not require special attention or servicing of any sort.

Other desirable objects and the novel features of construction, combinations and relations of parts through which the purposes of the invention are attained, are set forth or will appear in the course of the following specification.

The drawings accompanying and forming part of the specification illustrate present practical embodiments of the invention but structure and arrangement may be further modified and changed as regards the immediate illustration, all within the true intent and broad scope of the invention as hereinafter defined and claimed.

Fig. 1 in the drawings is a vertical sectional view of one of the knife sharpeners with broken lines indicating a knife blade inserted beneath the top guard into engagement with the face of the sharpening wheel;

Fig. 2 is a similar sectional view taken at a right angle to the plane of Fig. 1 and showing the motor control switch operably by the depressible top guard;

Fig. 3 is a horizontal plan view on substantially the plane of line 3—3 of Fig. 1;

Fig. 4 is a horizontal sectional view on substantially the plane of line 4—4 of Fig. 1;

Fig. 5 is a broken part vertical sectional view showing the guard lowered to hold a knife blade in engagement with the face of the grinding wheel;

Fig. 6 is a broken sectional view illustrating a modified form of guard structure for the knife edge.

Basically the invention comprises a sharpening disc or wheel 7 driven by an electric motor 8

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and housed within a casing 9 constructed to admit only the cutting edge of the knife 10 or other implement into engagement with the face of the disc.

For such purposes the casing is shown constructed with a top wall having a central opening 11 exposing the upper face of the disc and shaped at opposite sides with inclines 12 for guiding and supporting the knife blade at a proper sharpening angle to the upper face of the disc. In conjunction with these there is provided a guard or cover 13 having companion inclines 14 at the underside opposed to the inclined guiding and supporting surfaces 12.

This movable top guard is shown as supported on diametrically opposite rods or posts 15 vertically slidable in guide openings 16 in the base structure 17.

Springs are shown at 18, Fig. 2, for supporting the depressible top in the raised relation indicated.

A special feature of the movable guard 13 is that it is utilized in the present disclosure to control operation of the motor through the medium of a switch 19, Fig. 2, having an actuating toggle or button 20 engageable by a lug or shoulder 21 on one of the supporting rods 15.

Thus with depression of the guard or cover the motor will be thrown into operation and as pressure on the cover is released, it will rise under the lift of the springs 18 to permit the switch 19 to open the motor circuit.

The wheel 7 is yieldingly supported on the motor shaft, in the present disclosure, by a spring 22 surrounding the upper portion of the motor shaft and interposed between a shoulder 23, which may be a part of the rotor structure, and the central hub or bushing portion 24 of the wheel.

This bushing is shown in Fig. 1 as having an inwardly extending radial pin 25 engaging a screw groove 26 in the motor shaft pitched with rotation of the motor to thrust the wheel upwardly toward or into engagement with the abutment screw 27 in the end of the shaft, as in Figs. 1 and 2.

This screw also provides a means for removably securing the wheel on the end of the shaft, permitting quick substitution of different forms or grades of grinding wheels.

While different types and constructions of mo-

tors may be employed, it is preferred to use a motor of the design disclosed in copending application Serial No. 47,669, filed September 3, 1948, which issued as Patent No. 2,501,814 on March 28, 1950, in which the rotor 28 turns upon a central shaft 29 which is of tubular construction, to carry lubricant as by a wick 30 from a well or reservoir 31 formed in the base of the motor structure. This reservoir may be packed with sufficient lubricant at the time of manufacture and assembly of the machine to last possibly for the life of the instrument, thus to avoid lubrication and like servicing reuqirements.

The combined guard and cover 13 may be domed or otherwise shaped to form an ornamental top and smooth hand rest for applying the downward pressure required for forcing and holding the knife blade down on the rest 12 in properly inclined sharpening engagement with the face of the wheel. This pressure is regulated to hold the knife in desired firm engagement with the wheel and possibly light enough to permit the blade to be slipped back and forth to reach all portions of the cutting edge.

In these sharpening operations the applied pressure may back the wheel down on its screw mounting or coupling at 25, 26, after the manner indicated in Fig. 5, according to the tension of spring 22 and other factors present. In this manner the wheel may yield to pressure of the knife blade to regulate the cut and avoid harsh and irregular grinding operations. A fine, smooth cutting edge may thus be applied without drawing the temper or otherwise injuring the knife of the machine.

To prevent the edge of the knife from contacting the supporting posts 15 when it is slipped into position beneath the guard, these posts may be surrounded by projecting washers such as indicated at 32.

If desired, the parts may be constructed and arranged as in Fig. 6, with the protecting washers elongated or in the form of sleeves 33 extending the full height of the exposed portions of the rods 15, and in such case the cover lifting springs 18 may be interposed between the lower ends of these sleeves and the top of the stator structure 34.

The machine constructed as disclosed is made up of but relatively few parts and these all of simple, inexpensive design. All active parts of the machine are fully protected and enclosed to the extent that they can only be reached by the edge of an inserted knife blade or the like.

The operation of the machine is simple, direct and automatic to the extent that it is merely necessary to insert the knife blade into the inclined guides formed between the opposing inclined walls 12 and 14 of the casing and cover and to depress the latter to start the motor and to hold the blade with the desired pressure against the face of the wheel. The guides at opposite sides of the machine may be of the same or different inclines to produce the same or differently angled bevels or cutting edges. These inclined guide surfaces, while promoting the formation of a definite angle, do not closely restrict the grinding action to such particular angle, since the knife may be tilted one way or the other to increase or decrease the bevel of the cutting edge.

Different grinding, smoothing or polishing wheels are readily interchangeable or reversible on the drive coupling end of the motor shaft. These wheels may be made with different grain surfaces on the flat, opposite faces of the same for obtaining different effects by reversal of the same wheel on the motor shaft.

What is claimed is:

1. An electric knife sharpener comprising an electric motor having a drive shaft, a sharpening wheel removably mounted on said drive shaft, a casing enclosing the motor and having an opening exposing the outer end face of said wheel and a cover movably mounted over the exposed face of said wheel, said cover and casing having opposed faces arranged to provide guideways for entrance of a knife blade therebetween into engagement with the face of the wheel, and a control switch for the motor arranged to be operated by movement of the cover toward the wheel.

2. An electric knife sharpener comprising an electric motor having a drive shaft, a sharpening wheel removably mounted on said drive shaft, a casing enclosing the motor and having an opening exposing the outer end face of said wheel and a cover movably mounted over the exposed face of said wheel, said cover and casing having opposed faces arranged to provide guideways for entrance of a knife blade therebetween into engagement with the face of the wheel, diametrically opposed rods movably supporting the cover on the casing and said guide faces being disposed at opposite sides of said rods and whereby said rods may serve as barriers confining an inserted knife blade.

3. An electric knife sharpener comprising an electric motor having a drive shaft, a sharpening wheel removably mounted on said drive shaft, a casing enclosing the motor and having an opening exposing the outer end face of said wheel and a cover movably mounted over the exposed face of said wheel, said cover and casing having opposed faces arranged to provide guideways for entrance of a knife blade therebetween into engagement with the face of the wheel, and a yielding screw coupling between the motor shaft and wheel for yieldingly thrusting said wheel outwardly in respect to said opening in the casing.

4. An electric knife sharpener comprising a motor supported with its shaft in upright position, a horizontally disposed knife sharpening wheel on the upper end of said motor shaft, a depressible guard over the upper face of said wheel and companion inclined guide faces on said depressible guard and about the periphery of said wheel for directing and holding a blade in inclined engagement with the face of the cutting wheel, a casing enclosing the motor and having an opening in the top of the same exposing the face of said wheel, rods sliding vertically in said casing and supporting said guard and said inclined guide faces being arranged in pairs at the opposite sides of said rods.

5. An electric knife sharpener comprising a motor supported with its shaft in upright position, a horizontally disposed knife sharpening wheel on the upper end of said motor shaft, a depressible guard over the upper face of said wheel and companion inclined guide faces on said depressible guard and about the periphery of said wheel for directing and holding a blade in inclined engagement with the face of the cutting wheel, rods operating in said casing and supporting said guard and a motor controlling switch in the casing operable by one of said rods.

6. An electric knife sharpener comprising a motor supported with its shaft in upright position, a horizontally disposed knife sharpening

wheel on the upper end of said motor shaft, a depressible guard over the upper face of said wheel and companion inclined guide faces on said depressible guard and about the periphery of said wheel for directing and holding a blade in inclined engagement with the face of the cutting wheel, rods operable in said casing and supporting said guard and guard washers on the exposed end portions of said rods for preventing engagement of the cutting edge of a knife therewith.

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