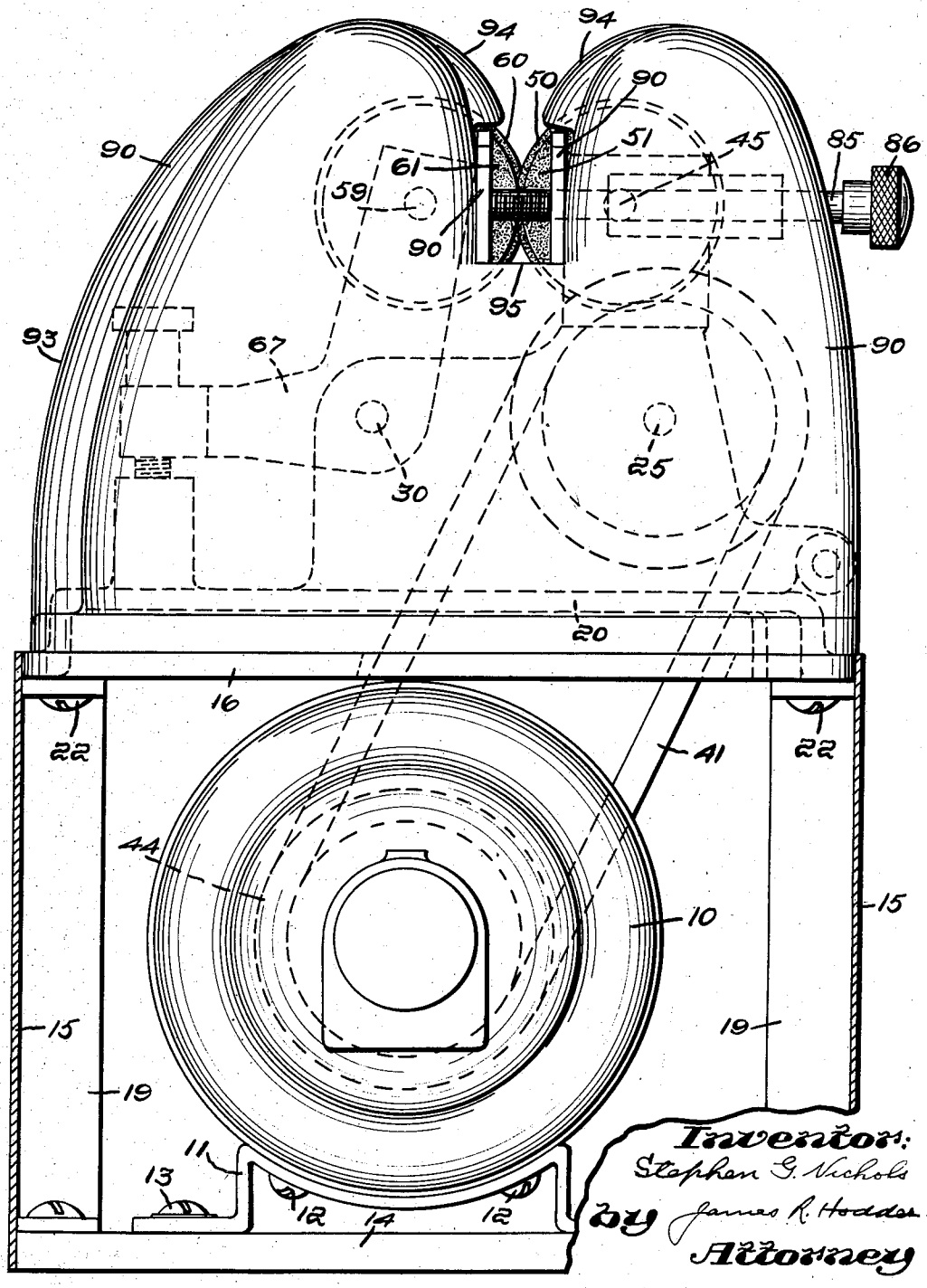
Sept. 20, 1949. S. G. NICHOLS 2,482,633

SHARPENING UNIT

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Fig. 1.




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Fig. 2.

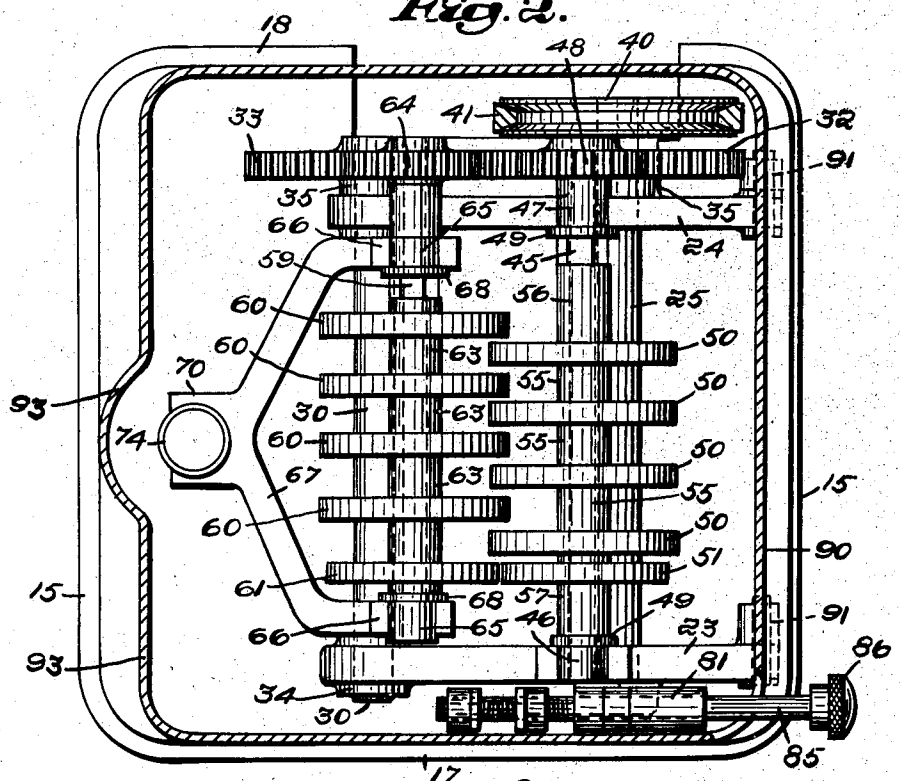
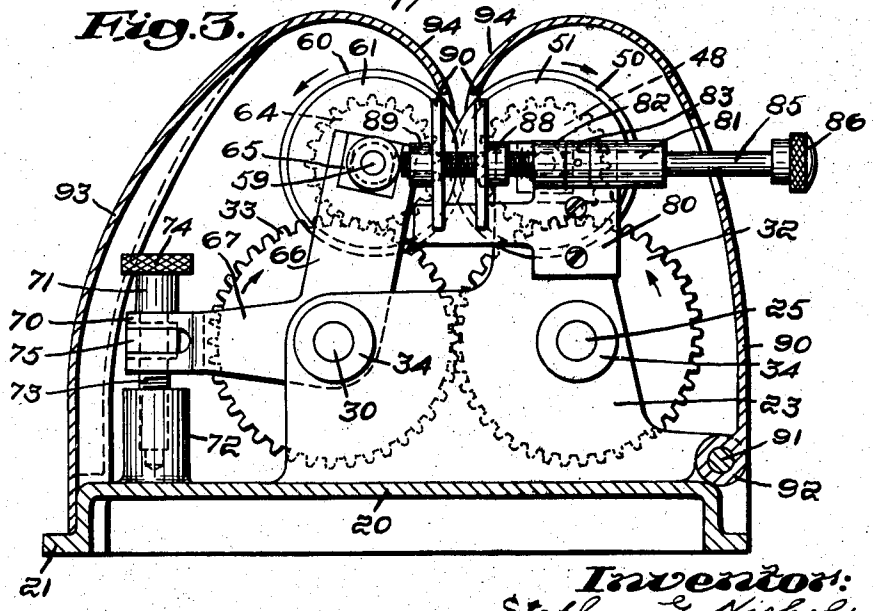



Fig. 3.




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## SHARPENING UNIT

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1 Claim. (Cl. 51—80)

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My invention relates generally to grinding apparatus for sharpening knives or the like cutlery, and more particularly to a motor-driven sharpening device so constructed and arranged that any unskilled operator may perform a highly efficient job of sharpening on any type or size of knife.

An important object of my invention is to provide a knife sharpener which is specially adapted for use where large numbers of knives are in continuous service and, accordingly, in frequent need of sharpening, and where speed and accuracy in the grinding operation is important.

Another prime object of my invention resides in the provision of safety means so that there can be no degree of injury to any person using my sharpener.

A further feature is the provision of blade-holding and knife-seating means so positioned in relation to the grinding wheels that an efficient sharpening may be imparted to knives of various size, thickness, and length.

An additional object of my invention is to construct my sharpener in the form of a portable unit which may be of convenient size, shape, and weight to be easily carried from one location to another, which may be plugged in to any usual electrical outlet, and which can be positioned on any counter, bench, shelf, or table.

Heretofore in devices of this kind it has been customary for operators to grind or sharpen knives on an open and unguarded unit, which has from a practical standpoint necessitated highly skilled workmanship, if efficient and satisfactory results were to be obtained. Otherwise, poor cutting edges resulted, knives were damaged, replacement costs were high, and accidents were numerous. Unskilled workers, therefore, were unsatisfactory to perform such work.

In my novel unit, however, the operator has merely to position the knife where indicated through the opening provided in the cover guard and to guide it back and forth across the grinding wheels. There is little chance for error, injury, or mutilation of the blade and, therefore, this work may be performed by unskilled operators.

Further features, novel improvements and advantages will be hereinafter more fully pointed out and claimed.

Referring to the drawings wherein I show a preferred embodiment of my invention:

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Fig. 1 is a front elevational view of my complete unit;

Fig. 2 is a plan view partly in cross-section, showing the grinding mechanism, and

Fig. 3 is a front end view with the cover and base in cross-section.

I prefer to form my portable power grinding unit with the bottom portion enclosing a suitable motor such as a one-quarter horsepower or other fractional power electric unit and with a plurality of grinding wheels supported in the upper part.

One set of the grinding wheels is constructed and arranged for adjustment toward and from the other to compensate for wear and has a suitably hinged cover to partially enclose and protect the grinding mechanism.

In the drawings, a suitable electric motor is designated generally at 10 and is seated on a suitable bracket 11 and secured thereto by screws 12—12, said bracket 11 in turn being fastened to the bottom portion 14 by bolts 13. The motor 10 is housed within the box-like compartment comprising the bottom 14, sides 15—15, top 16, closed end 17, and the opposite end 18 cut away to permit access to the motor 10. The top 16 is braced by a plurality of supporting standards 19.

A base 20, which supports the grinding apparatus, is formed with a depending flange portion 21 which rests upon the top 16, and is attached thereto at each corner by suitable bolts or fastenings 22—22, which may extend thru the top 16 and thru the supporting standards 19. Extending upwardly from the base 20 at each side are arms 23 and 24. Suitably journaled in these frames 23 and 24 are a pair of shafts 25 and 30 extending from one frame to the other, each projecting beyond the frame 24 and carrying on their respective outer ends gears 32 and 33. Journaled bearings for these shafts are indicated at 34—34 in the frame 23, and at 35—35 in the frame 24. On the shaft 25 is a pulley 40 which is driven by a V-belt 41 extending downwardly to a corresponding driving pulley on the motor 10, as indicated in dotted lines at 44, Fig. 1.

Thus the motor will drive the pulley 40 and, with the gears 32 and 33 in mesh, will drive said gears in the direction shown in the arrows, Fig. 3. Mounted above the gear 32 in the frames 23 and 24 is a countershank 45 adapted to rotate in suitable bearings, indicated at 46 and 47, in the

upper part of the frames 23 and 24, respectively, said countershaft extending beyond the frame 24 and carrying a gear 48 adapted to mesh with the gear 32 and rotatable in the direction of the arrow, Fig. 3. Thrust collars 49—49 hold this countershaft 45 in position, and mounted on said countershaft are a series of grinding wheels 50—50 of equal diameter, and a special grinder 51 of smaller diameter, as will be further explained.

These grinders 50 are, preferably, held in spaced relation by cylindrical washers or hubs 55, with end pieces 56 and 57 to hold the grinding wheels in proper position and clamp the same on the shaft 45 so that the grinders will rotate therewith when driven by the gears 32 and 48. A cooperating set of grinding wheels 60—60 positioned on a countershaft 59 and a special grinder of smaller diameter 61 are arranged with similar spacing washers 63 and in staggered relation with the grinders 50 on the other countershaft, as just described. These grinding wheels are, respectively, of sufficient diameter to overlap, as shown in Fig. 2, except for the special grinders 51 and 61, which are of smaller diameter and are adapted to contact with each other, or nearly so.

The countershaft 59 carries a pinion 64, see Fig. 2, which is arranged to mesh with the lower gear 33 and will be rotated in the direction of the arrow, Fig. 3, so that the complemental grinders 50 and 60 are thus rotated in opposite directions, as well also as the end or contacting grinders 51 and 61.

In order to afford relative adjustment between the grinders 50 and 60, I mount the countershaft 59 in suitable journaled bearings 65 on each end of the upper arms 66 of a bell crank yoke 67, having said arms 66 mounted on the shaft 30, which shaft 30 carries the gear 33 as above described. The yoke 67 is constructed and arranged for adjustment of the countershaft 59 to move the grinders 60 toward and from the grinders 50 for adjustment or to compensate for wear. Thrust collars 68—68 will hold the countershaft 59 in desired lengthwise adjustment, as shown in Fig. 2.

To rock the yoke 67 on its bearings on the shaft 30, I provide a forked hub 70 at the center of the yoke 67, thru which hub 70 an adjusting screw 71 is fitted, with the shank of said screw 71 threaded, as shown at 73, into a correspondingly tapped recess in a block 72 mounted on the base 20, and with the upper end of the bolt having a head 74, preferably knurled to permit manual rotation of the same, to thus raise or lower the upper end of the yoke 67 and thereby rock the same on the shaft 30, to thus move the grinders 60 toward or from the cooperating grinders 50.

Any suitable connection for this purpose between the adjusting bolt 71 and the hub 70 may be effected, but as herein shown I provide a forked portion in the hub in which fork a block 75 is fitted, which block is secured by a set screw, or is formed integral with the adjusting bolt 71 and thus moves the yoke upwardly or downwardly to rock the same on the pivot 30.

I provide a suitable and novel guiding element for the knife handle when the knife blade is positioned across the overlapping portions of the grinders 50 and 60 and the contacting faces of the grinders 51 and 61. For this purpose, I attach a bracket 80 to the side and upper part of the arm 23, which bracket carries a pair of cylindrical bearings 81 and 82, and spaced therebetween is a collar 83, which collar is secured by a set screw to a shaft 85 of an adjusting screw, said shaft having a knurled turning handle 86 to rotate the same.



The adjusting screw 85 has a threaded projecting portion extending beyond the collar 82 and being threaded into correspondingly tapped hubs 88—88 of knife handle guides 90—90 by right and left-handed threads, so that manipulation of the adjusting screw 85 will move the guides 90—90 toward or away from each other. The position of the adjusting screw 85 is arranged substantially in alignment with the contacting faces of the grinders 51 and 61. These guides 90 constitute an automatic positioning and guiding gauge for the knife handle so that the operator can hold the knife blade into sharpening position on the overlapping grinders 50 and 60.

With the contacting grinding members 51 and 61 in alignment, the extreme edge portion of the blade adjacent the handle can be effectively sharpened, the operator simply rocking the knife blade slightly to permit this sharpening action on the blade adjacent the handle. This is an important and novel feature which cannot be practically performed on ordinary grinders of this general type, so far as I am informed.

Thus, the operator adjusts the shaft 85 so that the guides 90 will substantially span and fit the handle of the knife being sharpened; the motor 10 is energized from any suitable source of power by plugging in the wires or switch (not shown), and the adjustment, if any, on the yoke 67 being effected by manipulating the adjusting screws 71. Thereupon, the operator fits the knife handle thru the guides 90, bringing the blade down on the overlapping portions of the grinders 50 and 60, drawing the knife slowly once or twice back and forth across the grinders to effect the sharpening action, and thereupon swinging the knife handle down slightly to insure the operation of the contacting grinders 51 and 61 on the edge of the blade next to the handle, and the sharpening is completed.

In order to provide a protecting guard and guide for the rotating sharpening elements, I arrange a cover 90 pivoted at 91—91 to upstanding lugs 92 formed on the base 20, said cover being of light metal construction and with an opening to fit over the adjusting screw 86 so that the cover can be swung off and on without interference with the adjusting screw.

This cover 90 is also formed with an extension 93 to fit over the adjusting screw 71 and the head 74, as best shown in Figs. 2 and 3. The top of the cover 90 is preferably formed with an inwardly curved surface 94—94 opening into a slot 95 of sufficient area and in proper position to permit the knife handle and blade being operated on by the grinders, and which also protects the hands of the operator from contact with or injury by the rotating gears or grinders.

I claim:

A portable power-driven knife sharpening unit of the kind described, comprising a motor carried in the lower part of said unit, two rotatable shafts each carrying a set of sharpening elements adapted to be rotated by said motor, one of said shafts being mounted in fixed bearings, and the other of said shafts being mounted in the arms of a pivoted bell crank yoke, adjusting means to rock said yoke on its pivot, said sets of sharpening elements including a plurality of overlapping grinding wheels arranged in staggered relation and a pair of grinding wheels arranged in tangential relation to operate simultaneously on a knife blade to be sharpened, manually adjustable knife handle guide means positioned adjacent to said tangential grinders and adapted to seat

the heel of said blade in contact therewith, the adjusting means on said bell crank yoke adapted to move one set of the sharpening elements toward and from each other, and a removable protecting and guiding cover for said sharpening elements.

STEPHEN G. NICHOLS.


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