

Nov. 19, 1940.

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2,222,361

SHARPENING DEVICE FOR EDGED IMPLEMENTS

Filed Nov. 1, 1939

2 Sheets-Sheet 1

FIG. 1.

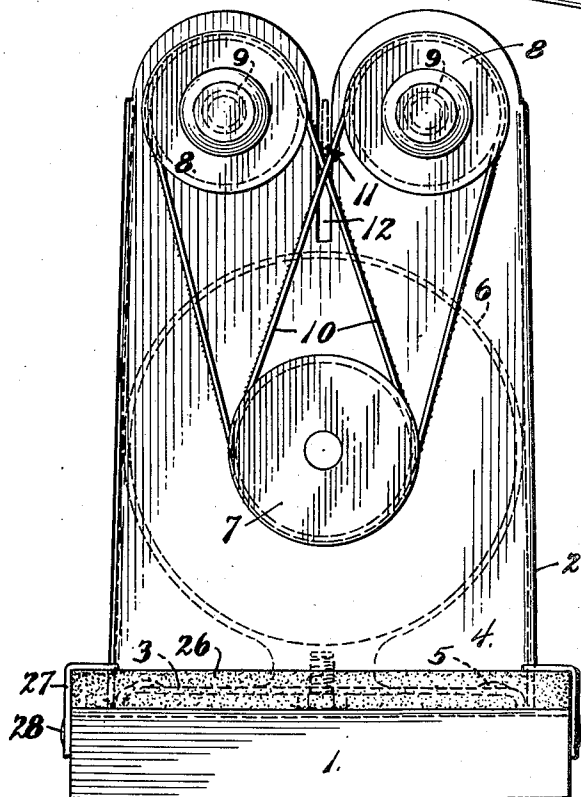
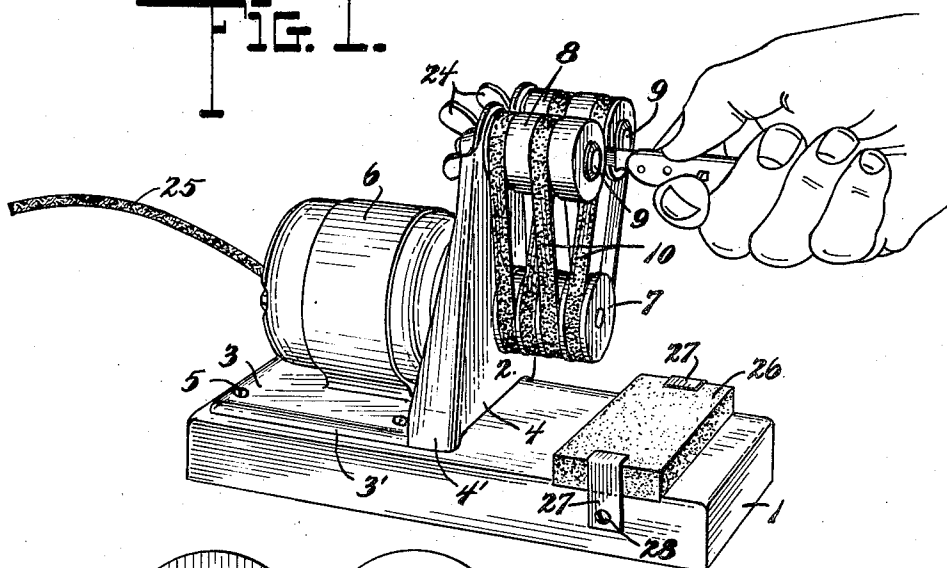


FIG. 2.

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2 Sheets-Sheet 2

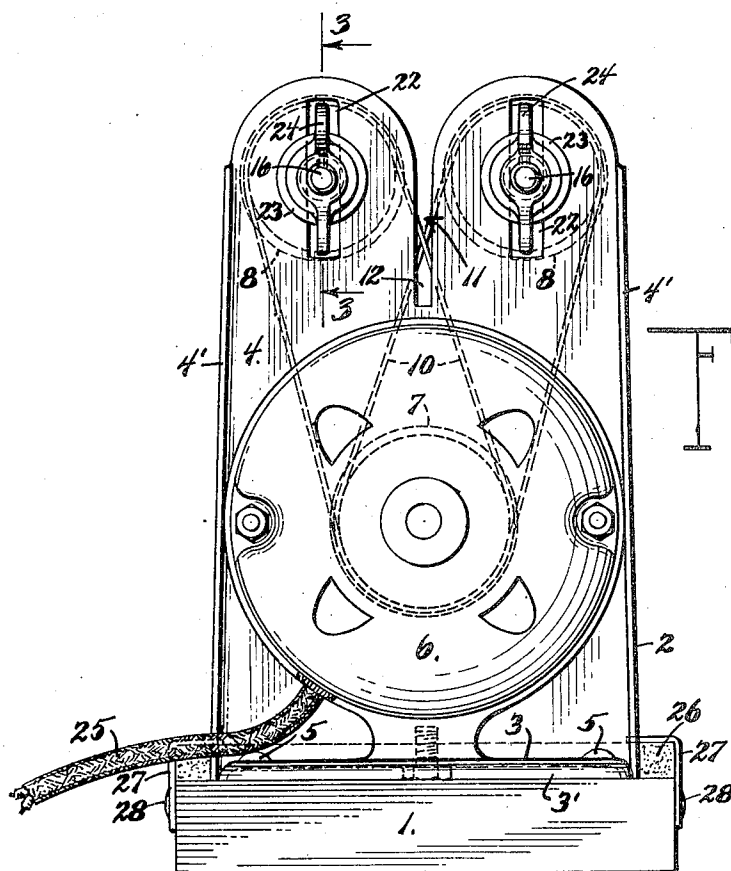


FIG. 7.

FIG. 4.

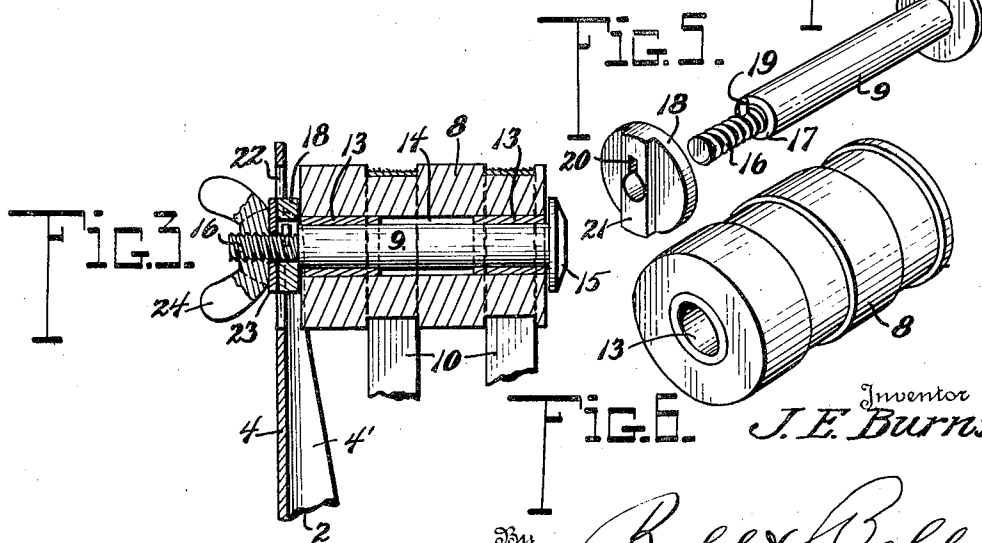


FIG. 3.

FIG. 5.

FIG. 6.

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UNITED STATES PATENT OFFICE

2,222,361

SHARPENING DEVICE FOR EDGED
IMPLEMENTS

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Application November 1, 1939, Serial No. 302,449

5 Claims. (Cl. 51—140)

This invention appertains to abrading devices or sharpening apparatus, and more especially, to a device for sharpening knives and other edged tools or implements.

One of the primary objects of the invention is to provide a simple, inexpensive, light weight, portable machine which is useful not only to manufacturers of cutlery and the like, but which is also useful in hotels, stores, private homes, and other places where it is found desirable from time to time to refinish or resharpen the cutting edges of knives and the like.

In carrying out the aforementioned objects, I have aimed to provide a construction which is power operated, as distinguished from hand operated, but which uses a negligible amount of power so that the cost of its operation is inconsequential.

A still further object of the invention is to provide a sharpening apparatus embodying a plurality of flexible abrasive belts or bands which are arranged in intersecting relation to each other so as to form a throat in which a knife or other edged implement may be introduced to cause the edged implement to be engaged thereby at opposite sides simultaneously.

Another object of the invention is to provide an improved assembly of flexible abrasive belts or webs which admits of convenient replacement of the belts or webs as the same become worn out, and at the same time affords a simple and easily operated means for adjusting the tension of the belts.

Other and further objects and advantages of the invention will be hereinafter described, and the novel features thereof defined in the appended claims.

In the drawings:

Figure 1 is a perspective view of an abrading apparatus or sharpening machine which is constructed in accordance with my invention, and illustrating the manner of use of the same;

Figure 2 is an enlarged view in front elevation of the machine shown in Figure 1;

Figure 3 is a fragmentary vertical sectional view, taken about on the plane of the line 3—3 of Figure 7;

Figure 4 is a perspective view of one of the upper spindles;

Figure 5 is a perspective view of the locking plate, by means of which the spindle shown in Figure 4 is held against rotation with respect to its support;

Figure 6 is a perspective view of one of the upper pulleys; and

Figure 7 is a view generally similar to Figure 2, illustrating the machine in rear elevation.

Like reference characters designate corresponding parts in the several figures of the drawings, wherein 1 denotes a base, which may be of any shape desired, and which may be constructed of any suitable material which is sufficiently rigid to afford a stable bed for the operating parts of the machine. Attached to the upper side of the base 1, is a support, generally designated 2, the support being preferably constructed of metal and including a horizontally disposed portion 3 and a generally upright portion or panel 4. The horizontal portion 3 may be attached to the base 1 in any convenient manner, as by a plurality of screws 5, with the panel 4 extending upwardly from the base near the middle of the latter. I have found that the members 3 and 4 may be economically constructed in one piece from sheet metal, from which a blank of suitable shape is first cut out and then bent into the form illustrated in the drawings. The horizontal portion 3 is preferably flanged at 3' along its opposite longitudinal edges and at its end opposite to the panel 4, and similarly, the panel 4 is flanged at 4' along its opposite vertical edges, these flanges serving to reinforce and stiffen the parts 3 and 4 respectively.

Attached to the upper side of the member 2 at the rear of the panel 4 is a motor 6, which may be of any conventional construction suitable for driving the machine. The motor shaft is extended through the panel 4 and has fixed thereto a pulley 7 at the forward side of the panel. As shown in the drawings, the pulley 7 is provided with a series of belt grooves, preferably four in number, although it is to be understood that my invention is not limited to any particular number of abrasive belts.

Mounted at the upper end of the panel 4 above the pulley 7 is a pair of pulleys 8, 8, each of which is rotatable on a fixed spindle 9 and is provided with two belt grooves aligned with alternate grooves in the lower pulley 7. The axes of the respective pulleys 8, 8 are displaced towards opposite sides of the median plane of the machine, as will be clearly understood from reference to Figures 2 and 7, so that the inner reaches of the abrasive belts or webs 10 will be disposed in intersecting planes forming a throat 11 between the upper pulleys 8, 8 to receive the knife or other edged implement to be sharpened. As clearly shown in Figures 2 and 7, the panel 4 is provided with a central slot 12 extending downwardly from its upper edge midway between the

pulleys 8, 8 and to a point somewhat below the line of intersection of the belts 10, the slot serving to guide the knife or other edged implement into engagement with the belts and to maintain the implement in a position assuring a uniform and equal bevel on opposite sides of the implement, as produced during the sharpening operation.

As previously mentioned, the upper pulley spindles 9, 9 are preferably maintained stationary, and accordingly each pulley 8 is preferably provided with an anti-friction bushing 13, which may extend the full length of the pulley, or which may be divided into shorter sections, with one section of the bushing arranged at each end of the pulley, as shown in Figure 3. The bushings are preferably pressed in the pulleys with a tight fit, according to the common practice of sealed bearings. In the arrangement as shown in Figure 3, the space 14 between the bushing sections 13, 13 may be used as a lubricant reservoir so that the bearing becomes substantially self-lubricating.

Each spindle 9 is provided at its forward end with a head 15 which serves to restrain the pulley 8 against axial movement on its spindle. The rear end of each spindle is reduced in size and threaded, as at 16, forming a shoulder 17, against which is seated a collar or plate 18 which is held against rotation on the reduced end 16 of the spindle by the interengagement with a pin 19 carried by the reduced extension 16 and received in a slot 20 in the plate or collar. The shoulder 17 serves to positively maintain the plate or collar 18 spaced axially from the head 15 as to leave the pulley 8 free to rotate on the spindle 9.

At the rear of the plate or collar 18, there is provided a protuberant rib or boss 21, which is adapted to be received in an elongated slot 22 provided in the upper end of the supporting panel 4. In assembling the pulleys 8, 8 on the supporting panel, the reduced end 16 of each spindle 9 is inserted through one of the slots 22 in the supporting panel 4 after the pulley 8 has been mounted on the spindle and the collar or plate 18 applied behind the pulley and interlocked with the pin 19. Thereupon, the spindle is brought into a position permitting the rib or boss 21 to be received in the slot 22, following which a washer 23 is applied onto the reduced end 16 of the spindle, behind the supporting panel, and a wing-nut 24 is screwed onto the threaded extension 16 and screwed up tight so that the spindle becomes rigidly and fixedly attached to the supporting panel. By loosening the wing-nut 24, the spindle 9 may be adjusted in an upward and downward direction, thereby permitting the abrasive belts 10 to be replaced without completely disassembling the upper pulleys 8, 8 and also permitting the tension on the belts to be adjusted as desired. To this end, the slots 22 are made substantially longer than the vertical height of the ribs or lugs 21 on the collars or plates 18, as clearly shown in Figure 3. When the wing-nuts 24 are screwed up tight, the washers or collars 18 are firmly locked on their respective spindles 9 through interengagement of the collars with the pins 19, and at the same time, the washers or collars 18 are restrained against rotation by means of the interengagement of the ribs or webs 21 with the slots 22. The spindles 9 thus become fixed to the supporting panel 4 and positively held against rotation, while the pulleys 8 are free to rotate on their respective spindles.

It will be understood that each spindle 9 is

adjustable independently of the other, which assures a more uniform adjustment of the tension of the abrasive belts 10, and is especially advantageous when employing a plural belt arrangement, as illustrated in the drawings.

In the use of the apparatus, the motor 6 is connected by a conductor cord 25 to a convenient electrical outlet whereby the abrasive belts 10 may be set into operation. The knife or other edged implement is then moved downwardly into the slot 12 to bring its lower edge into the throat 11 formed by the intersecting reaches of the belts, as shown in Figure 1. The knife may be moved back and forth while maintaining a light downward pressure of the same against the belts, thereby causing the knife to be uniformly ground on opposite sides simultaneously, resulting in the production of a keen edge on the same.

A suitable finish may be imparted to the cutting edge of the implement being sharpened through the selection of the proper grade of abrasive belt so that the entire sharpening operation may be performed with the aid of one set of belts. On the other hand, belts of different grades may be substituted, one for the other, when the occasion arises, or if a selective operation is preferred. For convenience, I preferably provide a whetstone or other suitable finishing instrumentality, generally designated 26, which is mounted on the base 1 near the forward end thereof. The whetstone may be attached by means of a clip 27 at each end of the same, each clip being secured to the base by a fastening screw 28. The use of the whetstone is optional, but where it is desired to produce an especially keen edge on the implement being sharpened, it will be found to be advantageous.

The invention readily lends itself to use in stores and other public places, as a handy and convenient means for sharpening pocket knives and the like.

While the specific details have been herein shown and described, the invention is not confined thereto, as changes and alterations may be made without departing from the spirit thereof as defined by the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is—

1. A device of the class described, comprising a vertically upright panel, a pair of pulleys rotatably mounted on said panel at one side thereof in laterally spaced relation to each other and with their central axes disposed normal to the panel, a third pulley spaced from the pair of pulleys aforesaid and arranged with its central axis disposed in a plane lying substantially midway between the central axes of the first pulleys, a plurality of traveling abrasive belts, at least one of said belts extending around the last mentioned pulley and one of the first mentioned pulleys, and another of said belts extending around the last mentioned pulley and the other of said first mentioned pulleys, said belts having their reaches inclined in opposite directions and crossing each other edgewise substantially midway between the first mentioned pulleys so as to form an angular throat between them for receiving the cutting edge of an implement to be sharpened, said panel having a slot extending downwardly from its upper edge at one side of the line of intersection of the abrasive belts and midway between the first mentioned pulleys to a point somewhat below the line of intersection of the abrasive belts at the opposite side of the

line of intersection, whereby to constitute a guide for the implement aforesaid, and means for driving said belts.

2. Apparatus of the class described, comprising a support having an elongated slot therein, a spindle carried by said support and having an abutment at one end and a reduced extension at the other end, a pulley rotatably mounted on the spindle intermediate the abutment and the reduced extension, a plate mounted on the reduced extension behind the pulley and restrained against rotation relatively to the spindle, said plate having a protuberant rib on the face thereof adapted to be received in the slot in the support when the reduced extension is inserted in said slot, whereby to restrain said plate and spindle against rotation in said slot, and means having releasable engagement with the reduced extension aforesaid at one side of the supporting panel for holding the plate against the opposite side of the supporting panel to maintain the rib in interlocking engagement with the slot aforesaid and with the axis of the spindle disposed normally to the supporting panel.

3. Apparatus as claimed in claim 2, in combination with a second pulley, an endless flexible abrasive belt extending about said pulleys, and means for driving one of said pulleys.

4. Apparatus of the class described, comprising a support including a generally upright panel member, motor means disposed at one side of

said panel member and having its drive shaft extended through the panel member, a pulley mounted on said drive shaft at the side of the panel member opposite to the motor means, a pair of pulleys rotatably mounted on said panel member above the first-mentioned pulley and laterally spaced from each other, a plurality of traveling abrasive belts each extending about the first-mentioned pulley and about one of the pair of pulleys so that the straight reaches of the belts are inclined in opposite directions and cross each other edgewise to form an angular throat therebetween, and means for fixedly adjusting the pair of pulleys towards and away from the first-mentioned pulley, said adjusting means comprising a spindle for each of the upper pair of pulleys extended through an elongated slot in the panel member, and means mutually engaging each spindle and panel member at opposite sides of the latter for adjustably securing the spindles to the supporting panel, said last-named means being so constructed and arranged as to restrain the spindles against rotation, while leaving the pulleys free to rotate thereon.

5. Apparatus as defined in claim 4, wherein each of the upper pair of pulleys is provided with axially spaced anti-friction bushings embracing its respective spindle and defining an annular substantially sealed lubricant space about the spindle intermediate the bushings.

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