

Dec. 9, 1947.

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2,432,231

DEVICE FOR SHARPENING KNIVES OR THE LIKE

Filed Dec. 20, 1945

2 Sheets-Sheet 1

Fig. 1.

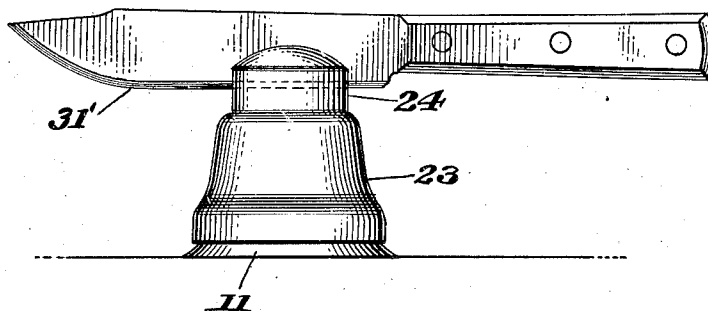


Fig. 2.

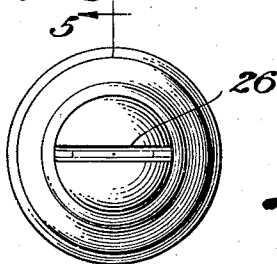


Fig. 3.

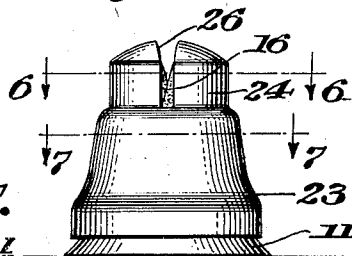


Fig. 4.

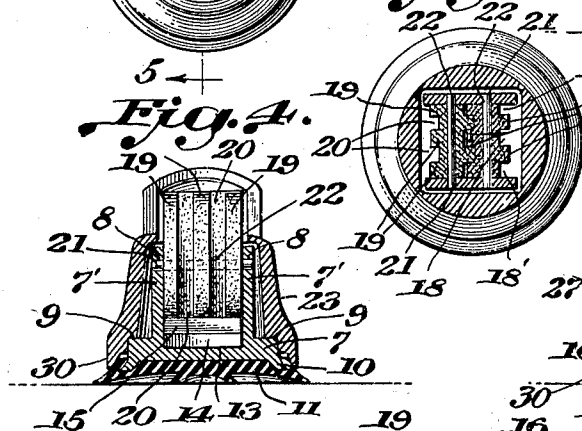


Fig. 5.

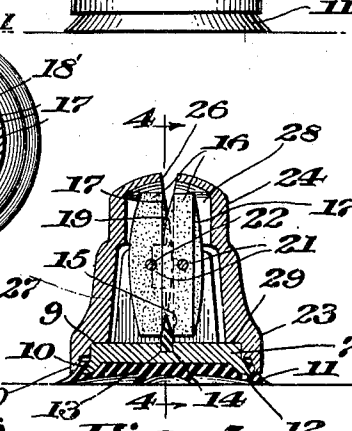


Fig. 6.

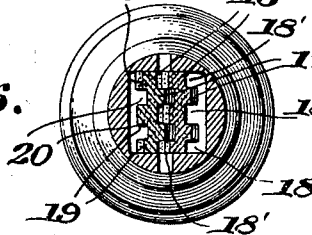
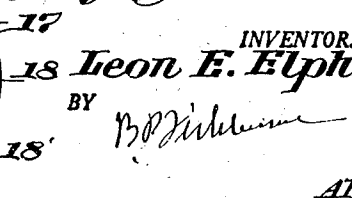


Fig. 7.



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2 Sheets-Sheet 2

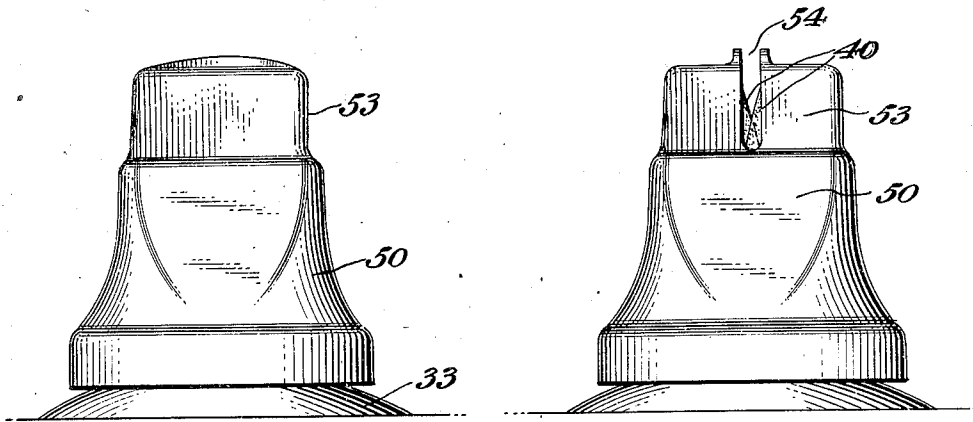


Fig. 8.

Fig. 9.

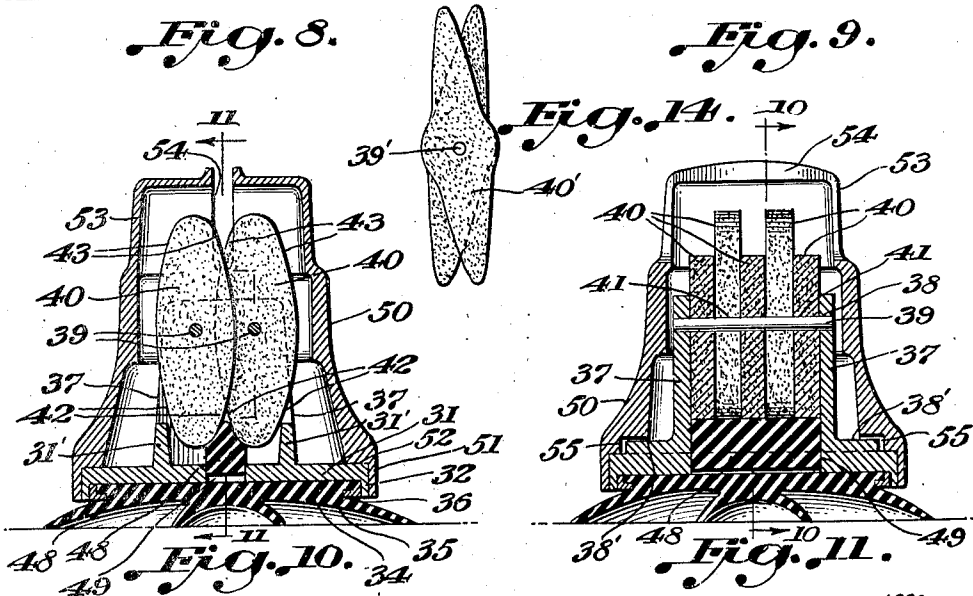


Fig. 10.

Fig. 11.

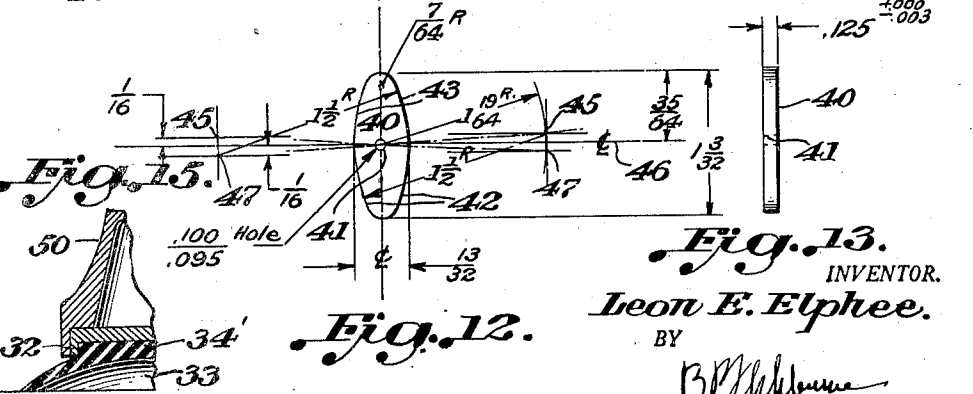


Fig. 12.

Fig. 13.

Fig. 15.

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DEVICE FOR SHARPENING KNIVES
OR THE LIKE

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6 Claims. (Cl. 51-214)

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My invention relates to improvements in sharpeners for knives or the like.

An important object of this invention is to provide a sharpener for knives or the like, in which the sharpening or cutting elements are adjustable to provide the maximum number of sharpening or cutting faces for one set of elements.

A further object of the invention is to provide a sharpener for making a correct edge on knives or the like, to be used by those unskilled in such art.

A further object of the invention is to provide a sharpener whose cutting elements provide the maximum cutting or sharpening surface.

A further object of the invention is to provide a sharpener having means for maintaining equal pressure against both sides of the blade being sharpened, for accommodating blades of various thicknesses, and for eliminating the necessity of applying heavy pressure or force to the blade being sharpened.

A further object of the invention is to provide a device of the above mentioned character so constructed that in a very small space, there is the equivalent of grinding wheels of large diameters.

A further object of the invention is to provide a device of the above mentioned character which will cut at both sides of the blade and give a very fine keen edge and prevent a one sided edge.

A further object of the invention is to provide a device of the above mentioned character which will produce a hollow ground effect.

A further object of the invention is to provide a device of the above mentioned character which will sharpen the blade and will not peel off slivers of steel which is a disadvantage encountered in connection with hardened steel sharpeners.

Other objects of the invention are to provide a sharpener which is compact, safe to use, and which may be secured to the working table or surface without the use of nails, screws or the like.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this application, and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a side elevation of the knife sharpening device embodying my invention and showing the same in use,

Figure 2 is a plan view of the device,

Figure 3 is a side elevation of the device taken at right angles to Figure 1,

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Figure 4 is a vertical section taken on line 4-4 of Figure 5, and showing parts in elevation,

Figure 5 is a vertical section taken on line 5-5 of Figure 2, and showing the cutting elements in elevation,

Figure 6 is a horizontal section through the sharpening or cutting elements, taken on line 6-6 of Figure 3, and

Figure 7 is a horizontal section taken on line 7-7 of Figure 3.

Figure 8 is a side elevation of a modified form of knife sharpening device embodying my invention,

Figure 9 is a similar view taken at a right angle to Figure 8,

Figure 10 is a vertical section taken on line 10-10 of Figure 11,

Figure 11 is a similar view taken on line 11-11 of Figure 10,

Figure 12 is a side elevation of one of the sharpening or grinding elements,

Figure 13 is an edge elevation of the same,

Figure 14 is a side elevation of modified sharpening or grinding elements, and,

Figure 15 is a detailed section of a modified form of suction cup and associated attaching means.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention, the numeral 7 designates a cylindrical base, having upstanding sides 7', preferably formed integral therewith. The opposed sides 7' have openings 8. The cylindrical base 7 forms an upper shoulder 9 and this base is provided with a depending annular marginal flange 10. Arranged beneath the base 7 is a suction cup 11, formed of rubber or the like, having an annular groove 12, for receiving the marginal flange 10. The base 7 is provided upon its upper face with a radial groove 13, for receiving a resilient element 14, preferably formed of rubber. This resilient element has its upper end tapered, as shown at 15.

Arranged between the sides 7' is a pair of generally flat sharpening or cutting elements 16, preferably formed of "Carborundum," stone or other suitable material. These sharpening or cutting elements are identical and are interchangeable. Each sharpening or cutting element is provided upon one face with longitudinal ribs 17, spaced to provide a recess 18 between them and outer recesses 18'. Upon its opposite face, each element 16 has longitudinal ribs 19, spaced to provide recesses 20. The ribs 17 are staggered with respect to the ribs 19, so that the ribs 17 will

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enter the passages 20 of the companion sharpening or cutting element and the ribs 19 will enter the passages 18 and 18' of the companion sharpening or cutting element. The ribs 17 and 19 taper longitudinally in opposite directions and have grinding or cutting faces which are longitudinally curved. The longitudinal ribs are formed on arcs having large diameters, such as three inches. The construction and arrangement is such that in a very small space, there is provided the equivalent of grinding or sharpening wheels of large diameters, such as four inches. The cutting or grinding elements 16 are enclosed which prevents any particles of "Carborundum" or steel from falling on the working surface, such as a covered sink, table or the like, in the presence of food. The pivots for the grinding or cutting elements are eccentric with relation to the curved surfaces of the ribs.

The openings 8 receive horizontal pivot elements or pins 21, extending through openings 22, formed in the cutting or sharpening elements 16. These openings 22 are at the longitudinal and transverse centers of the cutting or sharpening elements 16.

The numeral 23 designates an outer case, which is preferably exteriorly circular in horizontal cross section and has an upper reduced extension 24 provided with a transverse diametrically extending slot 26. The outer case 23 has an inner chamber 27, preferably rectangular in horizontal cross section, for receiving the upstanding sides 7', and the case extension 24 also has an inner chamber 28, preferably rectangular in horizontal cross section. Near its bottom, the case 23 has a horizontal shoulder 29, to engage with the shoulder 9 of the base 7 and this case also has a depending marginal flange 30, to engage with the marginal portion of the suction cup 11 and clamp the same to the flange 10. The outer case 23 may have a snap fit upon the base 7.

In assembling the various elements of the device, the suction cup 11 may first be applied to the lower face of the base 7. The cutting or grinding elements 16 are now passed between the upstanding sides 7', and the ribs 17 of one element 16 interfit with the ribs 19 as a companion element 16. The pivot elements or pins 22 are now passed through the openings 8 in the sides 7 and the openings 22 of the cutting or grinding elements 16. The cutting and grinding elements are therefore pivotally supported by the sides 7' and project above the same. The resilient element 14 now held within the groove 13 engages between the lower ends of the ribs 17 and 19 of the cutting or grinding elements 16 and serves to spread the lower ends of these elements. The outer case 23 may now be placed upon the base 7 and will enclose the sides 7' and grinding or cutting elements 16. The slot 26 is now parallel with the inner sides of the cutting or grinding elements 16.

The blade 31' to be sharpened is now inserted into the slot 26 and brought into engagement with the curved faces of the ribs 17 and 19. This blade is now moved longitudinally. This blade will now pass between the adjacent face portions of the ribs 17 and 19, next to each other, and these face portions constitute in effect a continuous cutting surface. The extent of cutting or sharpening action is regulated by the downward pressure upon the blade 31, the upper ends of the sharpening or cutting element 16 yielding outwardly, in opposition to the resilient element 14.

When corresponding upper end portions of the then inner sets of ribs 17 and 19 wear, the cut-

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ting or grinding elements 16 may be removed as a unit and inverted and again placed upon the pins 22, thus bringing their lower ends into the operative position. When both ends of the then inner sets of ribs 17 and 19 become worn, the cutting or grinding elements 16 are removed and their then outer ribs 17 and 19 are arranged innermost or next to each other and the thus assembled cutting or grinding elements 16 are again positioned between the sides 7' and mounted upon the pins 8. The assembled cutting and grinding elements 16 may be inverted to utilize the lower end portions of the then inner ribs 17 and 19, for the reason stated. It is thus seen that the cutting or grinding elements 16 are adjustable to four positions for presenting the ribs for cutting or grinding purposes.

The form of the device shown in Figures 8 to 13, comprises a circular base 31, having a marginal depending flange 32. Arranged beneath the base 31 is a suction cup 33, preferably formed of rubber. This suction cup has an upper shank 34, provided with an annular groove 35, for receiving the annular flange of an attaching ring 36. This attaching ring has a press fit within the annular flange 32 and the ring 36 is permanently secured to the shank 34.

I contemplate omitting the attaching ring 36, and when this is done, the suction cup 33 has a shank 34', extending into the flange 32 and engaging therewith and held in place by cement or the like, Figure 15.

Formed integral with the base 31 are vertical sides 37, which are spaced and parallel, as shown. The base 31 is provided with lugs 38', at the transverse centers of the sides 37. The base 31 has ribs 31', to limit the inward movement of the upper ends of the sharpening elements, to be described. The sides 37 are provided near their upper ends with openings 38 for removably receiving pivot elements or pins 39.

In the present form of the invention, I provide sharpening or grinding elements 40, which are duplicates, reversible and interchangeable. Each sharpening element is preferably formed of aluminum oxide. In producing the sharpening element, the aluminum oxide powder is mixed with a binder and the mass is subjected to high pressure and is subsequently fired or vitrified. This is the conventional sharpening or grinding material. The sharpening element may also be formed of carborundum or other suitable material. Each sharpening element is flat, relatively narrow and elongated. Satisfactory results are had by forming the sharpening element $1\frac{3}{4}$ " long. They have a width of $\frac{3}{32}$ " at their longitudinal and transverse centers and a thickness of $\frac{1}{8}$ ". The sharpening element is provided at its transverse and longitudinal centers with an opening 41, which is formed when the sharpening element is molded. The sharpening element tapers longitudinally toward its opposite ends, providing curved grinding or sharpening faces 42 and 43. The lower grinding faces 42 are formed upon radii of $1\frac{1}{2}$ " from the points 45, $\frac{1}{16}$ " above the center line 46, while the upper curved faces 43 are formed upon radii $1\frac{1}{2}$ " from the centers 47, $\frac{1}{16}$ " beneath the center line. From actual tests which I have made, I have found that this precise curvature produces highly satisfactory results as blades of varying thicknesses may be properly sharpened at their edges, without grinding the faces of the blade at any considerable distance from the edge.

The elongated sharpening elements 40 are mounted upon the pins 39. Two of these sharpen-

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ing elements are mounted upon one pin and three sharpening elements upon the other pin, while this number may vary. The sharpening elements 40 in one set are alternately arranged with respect to the sharpening elements in the other set, and their curved cutting edges are staggered and interfit. Portions of these cutting edges therefore overlap. The elongated cutting elements are all separate and independently moveable and hence they can readily shift to accommodate a blade having slight local bends. The cutting elements 40 are duplicates and interchangeable and therefore provide four grinding surfaces for each cutting element, as explained in connection with the first form of the invention. The cutting edges of the elements 40 correspond to the ribs of the cutting elements in the first form of the invention.

The lower ends of the cutting elements 40 engage a resilient strip or block 48, which may be formed of rubber and held within a slot 49 in the base 31.

In Figure 14, I have shown cutting or grinding elements 40', corresponding to the grinding elements 40, but having an increased taper toward their opposite ends. These cutting elements 40 are mounted upon a single pivot 39', carried by the sides 37. Suitable resilient means will be employed to oppose the outward swinging movement of the upper ends of the elements 40'.

The numeral 50 designates the casing, provided at its bottom with an annular flange 51, and a shoulder 52. The base 31 has a snap fit in the flange 51, so that the base may be separated from the casing 50, when desired. The casing 50 is provided at its top with a reduced portion 53, which is preferably square in horizontal cross-section. This casing extension has a vertical slot 54, extending parallel with the pins 39 and horizontally spaced for equal distances from these pins. This slot receives the blade and guides the same between the edges of the sets of sharpening elements 40.

The casing 50 is provided at the shoulder 52 with notches 55, to receive the lugs 38. When the base 31 is inserted into the flange 51, the lugs 38' must enter the notches 55 before the base 31 can be completely seated. This arrangement assures that the assembled cutting elements 40 will be in proper position with respect to the slot 54.

To sharpen the blade, the device is secured to a table top or other surface by means of the suction cup 33. The blade is inserted into the slot 54, and is arranged between the cutting edges of the sets of elements 40, and moved longitudinally in engagement therewith. By virtue of the reduced casing extension 53, the end of the blade next to the handle may be brought into engagement with the sharpening elements so that the blade can be sharpened substantially throughout its entire length.

It is to be understood that the forms of my invention herewith shown and described are to be taken as preferred examples of the same, and that various changes in the shape, size, and arrangement of parts may be resorted to without departing from the spirit of my invention or the scope of the subjoined claims.

Having thus described my invention, what I claim is:

1. A device for sharpening knives or the like, comprising a support, elongated sharpening elements being adapted to be arranged in opposed relation, each sharpening element being provided upon its opposite faces with longitudinally ex-

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tending spaced ribs, each rib being tapered toward its opposite ends, the sharpening elements being identical and interchangeable so that the ribs of one sharpening element interfit with the ribs of the companion sharpening element, pivot elements carried by the support and passing through the sharpening elements near their transverse and longitudinal centers, and yielding means to oppose the swinging movements of the sharpening elements.

2. A device for sharpening knives or the like, comprising an upstanding support, upstanding elongated sharpening elements arranged adjacent to the support in opposed relation to each other and projecting above the support, each sharpening element being provided upon its opposite faces with longitudinally extending spaced ribs, the sharpening elements being identical and interchangeable so that the ribs of one sharpening element interfit with the ribs of the companion sharpening element, pivot elements carried by the support and passing through the sharpening elements near their transverse and longitudinal centers, and yielding means engaging the lower ends of the sharpening elements to spread such lower ends.

3. A device for sharpening knives or the like, comprising a support, a pair of spaced pivots carried by the support, a set of flat elongated sharpening elements having openings at their longitudinal and transverse centers for receiving one pivot, a second set of flat elongated sharpening elements having openings at their longitudinal and transverse centers for receiving the other pivot element, the sharpening elements of one set being arranged in staggered relation to the sharpening elements in the other set and interfitting, each sharpening element being individually moveable, yielding means engaging corresponding ends of the sets of sharpening elements to move their opposite ends together, and means to limit such movement of said opposite ends.

4. A device for sharpening knives or the like, comprising spaced upstanding supporting members having openings therein, a pair of spaced pivots removably mounted within the openings, an elongated sharpening unit provided substantially at its longitudinal and transverse center with opening means to removably receive one pivot, said unit including elongated sharpening elements which taper longitudinally toward their opposite ends, an elongated second sharpening unit provided substantially at its transverse and longitudinal center with opening means to removably receive the other pivot element, the second sharpening unit including elongated sharpening elements which taper longitudinally toward their opposite ends, the units being substantially identical and invertible in use, resilient means arranged between the lower ends of the units to spread such ends, and a case removably receiving the supporting members and having parts to cover the ends of the pivots to hold such pivots in place within their openings.

5. A device for sharpening knives or the like, comprising a base, an upstanding support carried by the base, a pair of spaced pivots mounted upon the upstanding support, upstanding elongated sharpening elements provided substantially at their longitudinal and transverse centers with openings which receive the pivot elements, each elongated sharpening element tapering toward its opposite ends, a resilient element carried by the base and arranged between the lower ends of the

sharpening elements, and stop means carried by the base and arranged near the lower ends of the sharpening elements and outwardly of the same.

6. A device for sharpening knives or the like, comprising a base, an upstanding support carried by the base, spaced pivots mounted upon the upstanding support, upstanding elongated sharpening elements provided substantially at their longitudinal and transverse centers with openings which receive the pivot elements, the sharpening elements being substantially identical, each sharpening element having its opposite longitudinal edges converging toward the opposite ends of the sharpening element so that the opposite ends are tapered, each sharpening element being reversible and interchangeable with the companion sharpening element, and a resilient element carried by the base and arranged between the lower ends of the sharpening elements to spread such lower ends.

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