KNIFE AND SCISSORS SHARPENING DEVICE

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This invention relates to a device for sharpening the blades of knives, particularly those with cutting edges having a substantially straight portion and also a convex tapered portion terminating in a point. It is also provided with means whereby the blades of scissors can be sharpened.

More specifically, this invention makes use of a permanent magnetic assembly in combination with mechanical elements of the device to hold a knife blade or scissors blade at selected sharpening angles with reference to a sharpening surface during the operation of sharpening said blades. This selected sharpening angle for knife blades is twenty degrees; it is much less for scissors blades.

The important features of this invention will be readily apparent from the following description and drawings in which:

FIG. 1 is a side elevation of the sharpening device, positioned for sharpening the straight portion of the cutting edge of knife blades. The permanent magnetic assembly holds the knife blade in place by contacting its upper face, and a shaped flat spring engages the lower face of the blade. The shaped arm, shown extending upward to the left is used when sharpening the scissors blades.

FIG. 2 is a plan view showing the sharpening stone, the base member on which it is mounted, and the sharpening device with the knife blade held therein.

FIG. 3 is a partial end elevation of the device showing the required tilting angle so that the extreme point of the knife blade can be sharpened.

FIG. 4 is a partial modified view of the device, as shown in FIG. 1, in which the shaped flat spring for containing the lower face of the knife blade is shown in modified form. This view eliminates the shaped arm 6a used in sharpening scissors. The function of bar 24 is identical with that of bar 6 in FIG. 1 when the sharpening device sharpens knife blades.

FIG. 5 shows the permanent magnetic assembly of FIG. 1, projected to show the rectangular form of both the magnet and the two pole pieces. It shows the hole for the screw which holds the magnetic assembly in place.

FIG. 6 shows a partial view of the device in which a magnetized back up plate abuts one pole piece of the magnetic assembly. This plate is shown with a stepped groove; the narrow portion to engage thin knife blades, and the wide portion to engage thicker blades.

FIG. 7 shows the tongue shaped end of the spring 15 in FIG. 1.

FIG. 8 is a side elevation of the knife sharpening device without the shaped arm 6a shown in FIG. 1. It is a full side elevation of the partial view shown in FIG. 4. In this form the device is limited to the sharpening of knife blades only.

FIG. 9 is a side elevation of the sharpening device for sharpening both knife and scissors blades. It is a modified design of the device as shown in FIG. 1. The shaped arm 6c, which is an extension of arm 6 in FIG. 1, is replaced by a separate arm 26. Also, the shaped flat spring assembly in FIG. 1, is replaced by a flat shaped spring 13.

Referring to the drawings, FIGS. 1 and 2, the device comprises a bar 6, the central portion of which is shaped for holding the rectangular permanent magnetic assembly which comprises a ferrite permanent magnet 13 and low carbon steel pole pieces 7 and 11, which are so positioned to hold the knife blade 4 at a selected angular relationship both to bar 6 and to the sharpening surface 3 of the sharpening stone 1. At the right hand end of bar 6 is a support member 8 adapted to remain in contact with the flat surface 2 during the sharpening operation. Bar 6 is usually made so that the distance of the knife blade cutting edge to contour surface 8a is in the neighborhood of four inches. Bar 6 is extended to the left of the magnetic assembly and above the main portion of the device. It is identified by the numeral 6a. This is the portion of bar 6 which is used when sharpening scissors. It should be noted here that combining the knife blade and scissors sharpening into one unit, as shown in FIG. 1, enables one to use bar extension 6a to help balance the weight of members 6 and 8 and thus to lessen the strain on the holding power of the magnet in handling the unit when the knife blade or scissors blade is attached to it. Plate 14, also of low carbon steel, is used as a stop to engage the back edge of the blade (both of the knife and scissors) and aligns same for sharpening.

Spring 15, along with screw 16, nut 17 and coil spring 18 cooperate to assist in maintaining the knife blade in contact with the pole piece 7 and 11. The supporting end 15a of spring 15 is provided with a tongue which engages a rectangular perforation or opening in bar 6. This perforation is shown as 6c in FIG. 2.

The use of this spring 15 is not necessary when sharpening carbon steel knife blades. Although stainless steel knives, which are made of many stainless steels and are magnetic, nevertheless, the intensity of their magnetic attraction in comparison with carbon steel is much less. Therefore, means such as this spring are helpful in preventing the stainless steel blade from tipping away from the magnetic pole pieces during the sharpening operation. Only nominal pressure is required by spring 15 to prevent this tipping.

It is further noted, in reference to FIG. 1, that flat surface 2 also supports base member 5 on which the flat sharpening stone is mounted so that sharpening surface 3 is maintained substantially flat and parallel to flat surface 2.

FIG. 3 shows the knife blade 4 tilted so that the knife blade point 9 is in contact with the sharpening surface 3. It also shows the support member 8 which is rigidly attached to bar 6. The convex surface 8a of support member 8 remains in contact with flat surface 2 during the sharpening operation. The curvature of this convex surface is so chosen that, as the device is tilted during the sharpening of the convex tapered portion of the knife blade, the selected sharpening angle will change only slightly from that for sharpening the straight portion.

FIG. 4 is a partial view of the knife sharpening device. Bar 24 replaces bar 6 shown in FIG. 1. Its function is identical as that of bar 6 with extension 6a omitted therefrom. Also in FIG. 4 is shown a shaped flat spring 19 riveted to bar 24. Its function is the same as for spring 15 as explained in a preceding paragraph, and is shown as an alternate. Also in this view the shaped arm 6c, shown in FIG. 1, is intentionally omitted. The device therefor, as shown in this FIG. 4, is intended only for sharpening knife blades.

FIG. 8 is a full side elevation of the device shown by partial side view FIG. 4. Support member 8 performs the same function as explained for it in the description of FIGS. 1, 2 and 3. The operation of the device is as follows: To sharpen the straight portion of one side of the cutting edge of the blade, the blade is held in the device as shown in FIGS. 1 and 2 and moved over the surface of the sharpening
stone in a rotary motion; to sharpen the convex tapered portion of the cutting edge, the rotary motion is continued as the handle is slowly tilted until the point of the knife blade contacts the stone. This procedure is continued until the desired sharpness of the blade is obtained. The blade is then removed from the device, turned end for end, and placed again in contact with the pole pieces as shown in the drawings. The sharpening operation, as described above for one side of the blade is then repeated for the other side of the blade.

It is essential that, before the sharpening operation, the device is positioned close to the point of the knife blade so that the forward and outwardly curved end of support member 8 is approximately in line with the point of the blade. In this relationship of the knife blade and the device, the best results for sharpening are obtained.

In FIG. 2 support member 8 is shown with the two end portions curved outward. Also in FIG. 2 the knife blade is identified by the numeral 9. In FIG. 1, the knife blade is shown contacting the sharpening surface 3 for sharpening the straight portion of the cutting edge. In this position it is apparent that the knife blade point will be in the position indicated by the numeral 9 in FIG. 1. Now, as the convex tapered portion is sharpened, the handle end of the knife blade is raised. This tilting is continued until the knife blade point 9 contacts the sharpening surface at point 10. It is thus evident that the distance of the blade point 9 is closer by distance “A” to the point where the contoured surface 6o contacts the flat surface 2. This would change the selected sharpening angle unless the outwardly curved ends 8o of support member 8 were not moved out this distance “A” as shown in FIG. 2.

Returning to FIG. 1, a screw 20 is shown for holding the magnet and pole pieces and plate 14 tightly together and also for holding them firmly to bar 6. Screw 20 is also shown in FIG. 4.

Bar 6 and support member 8 should be made of non-magnetic material such as aluminum or plastic substance.

The base member 5 on which the sharpening stone 3 is mounted, is shown as a molded plastic. It is extended beyond the left end of the stone to provide means by which the left hand of the operator can hold the base member in contact with the flat surface 2 during the sharpening operation. When sharpening the opposite side of the cutting edge, the operator turns the stone and base assembly end for end from the position shown on the drawing.

When sharpening the blades of scissors, blade 21, as shown in cross section in FIG. 1, is placed in contact with the top faces of the pole pieces and abutting plate 14 for alignment. The device is then so positioned that surface 6b of the shaped arm 6a of bar 6 contacts surface 2 and the cutting edge of blade 21 contacts the sharpening surface 3. The sharpening operation proceeds by using a rotary motion, the blade remaining in a horizontal plane throughout the operation, keeping surface 6b in contact with surface 2, and the blade cutting edge in contact with sharpening surface 3. After sharpening one blade of the scissors it is removed from the device and the other blade positioned therein as above described. Surface 6b of support arm 6a is rounded as shown in FIG. 2.

I claim:

1. In a sharpening device designed to sharpen the cutting edge of kitchen knives and the like, said knives having cutting edges which are straight portion of a convex tapered portion terminating in a point, a flat surfaced sharpening stone so mounted on a flat surface that its sharpening surface is substantially parallel thereto, a sharpening device comprising: a shaped bar at one end of which is mounted a magnetic assembly which includes a permanent magnet and a pair of pole pieces in contact with opposite faces of the magnet, said pole pieces being positioned to contact the upper face of said knife blade and hold same securely in a selected angular relationship to said bar, and at the other end of said bar a support member extending lengthwise of and parallel to said blade, the bottom surface of said member being convex in shape with the ends curved lengthwise upward from the center and arranged to remain in contact with said flat surface while sharpening the straight and convex tapered portions of the blade, said device being designed to hold the blade in selected angular relationship to said sharpening surface, and the forward end portion of said convex bottom surface of said support member coming in contact with said flat surface as the device is tilted to sharpen the convex tapered portion of the cutting edge of said blade.

2. The sharpening device in claim 1 wherein a shaped flat spring is arranged to contact the bottom face of the knife blade and thereby assist in maintaining the blade in contact with the pole pieces and therefor prevent tilting of the blade therefrom.

3. In a sharpening device designed to sharpen the cutting edge of blades of kitchen knives and the like, said blades having cutting edges with both a straight portion and a convex tapered portion terminating in a point, a flat surfaced sharpening stone mounted on a base member which in turn is so mounted on a flat surface that the sharpening surface is substantially parallel to said flat surface, a magnetic assembly comprising: a shaped flat surface that has a magnet which at one end is mounted a magnetic assembly which includes a permanent magnet and a pair of pole pieces in contact with opposite faces of the magnet, said pole pieces being positioned to contact the upper face of said knife blade and hold same securely in a selected angular relationship to said bar, and at the other end of said bar a support member extending lengthwise of and substantially parallel to said blade, the bottom surface of said support member being convex in shape with the ends curved lengthwise upward from the center and also outward and away from said blade, and arranged to remain in contact with said flat surface while sharpening the straight and convex tapered portions of the blade, said device being designed to hold the blade in selected angular relationship to said sharpening surface, and the forward end portion of said convex bottom surface coming in contact with said flat surface as the device is tilted to sharpen the convex tapered portion of the cutting edge of said blade.

4. The knife sharpening device in claim 3 in which a shaped flat spring is arranged to engage the bottom face of the knife blade and to assist the magnetic attractive force of the magnetic assembly in maintaining the blade in contact with the pole pieces during the sharpening operation.

5. In a device for sharpening kitchen knives and the like wherein the knife is sharpened by moving the blade over the surface of a sharpening stone while the said blade is held in a selected angular relationship to said surface, said sharpening stone being supported on a substantially flat surface and the upper surface of said stone being substantially parallel to said flat surface in at least one direction, said device comprising a bar on which at one end is mounted a permanent magnet with a pole piece on opposite faces of same for contacting the top side of said blade and holding said blade by magnetic attraction, said bar and also at a selected angular relationship to said bar, and at the other end of said bar a member for supporting said bar on substantially flat surface, additional holding means located adjacent to one of the magnet pole pieces and said additional holding means being arranged to contact the lower side of said sharpening stone while said blade is held in a selected angular relationship to said surface, said sharpening stone being so mounted that its sharpening surface is maintained substantially parallel to a flat sur-
face in at least one direction, the combination of: a shaped bar at one end of which is mounted a magnetic assembly which includes a permanent magnet and a pair of pole pieces in contact with opposite faces of said magnet, said pole pieces being positioned to contact the upper face of a knife blade on their lower edges and arranged to contact the inner face of a scissors blade at their upper edges, and hold said blades securely in selected angular relationships to said bar, and at the other end of said bar a support member adapted to remain in contact with said flat surface during the knife blade sharpening operation so that the knife blade is held at the selected sharpening angle for said blade in relation to said sharpening surface, and an arm demountably attached to said shaped bar in proximity to said magnetic assembly and extending outwardly therefrom, said arm having, at its outwardly extending end, a portion adapted to engage the said flat surface when sharpening scissors blades and to maintain said blades at the correct sharpening angle for such blades in relation to the sharpening surface during the sharpening operation.

7. In a device arranged for sharpening kitchen knives having cutting edges with both a straight portion and a convex tapered portion terminating in a point, and also scissors blades on a sharpening surface of a sharpening stone by moving said knife and scissors blades over same, said sharpening stone being so mounted that its sharpening surface is maintained substantially parallel to a flat surface in at least one direction, the combination of: a shaped bar having at its mid-portion a permanent magnetic assembly consisting of a permanent magnet and a pair of pole pieces in contact with opposite faces of the magnet, said magnetic assembly being so positioned on said bar to hold a knife blade and also a scissors blade at selected angular relationship to said bar, and said shaped bar having at one end a support member adapted to engage said flat surface to maintain the knife blade in selected angular relationship to said sharpening surface during the sharpening of said knife blade, said support member extending lengthwise of and parallel to said blade, the bottom surface of said member being convex in shape with the ends curved lengthwise upward from the center, and also outward and away from said blade, and arranged to remain in contact with said flat surface while sharpening the straight and convex portions of the blade, and the other end of said bar having a shaped end adapted to engage said flat surface when sharpening scissors blades and holding same in selected angular relation to said sharpening surface when sharpening scissors blades.

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