United States Patent

Juranitch

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[45] **Apr. 11, 1972**

[54] BLADE SHARPENING GUIDE

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[21] Appl. No.: **33,790**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 757,952, Sept. 6, 1968, abandoned.

[52] **U.S. Cl.** **76/82,** 51/221
[51] **Int. Cl.** **B21k 11/02**
[58] **Field of Search** 76/82, 82.2; 51/221, 218

[56] **References Cited**

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[57] **ABSTRACT**

A clamp-type blade holder including blade edge angle determining bars for guiding the sharpening of a blade edge on a flat sharpening surface, such as a hone. The blade holder includes guide bars coacting with the blade edge to engage the hone and maintain the sharpening angle the same during all stroking on the hone, thereby producing an accurate sharpening angle that will enable a razor edge.

7 Claims, 9 Drawing Figures

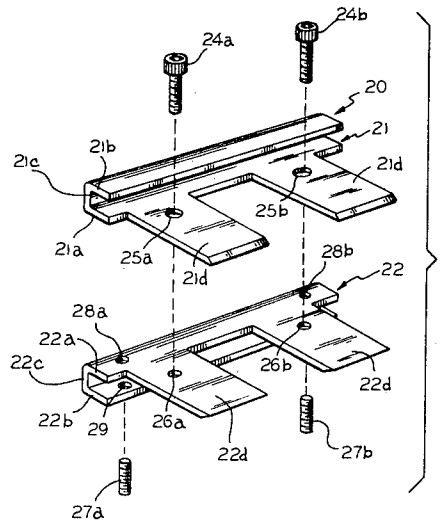
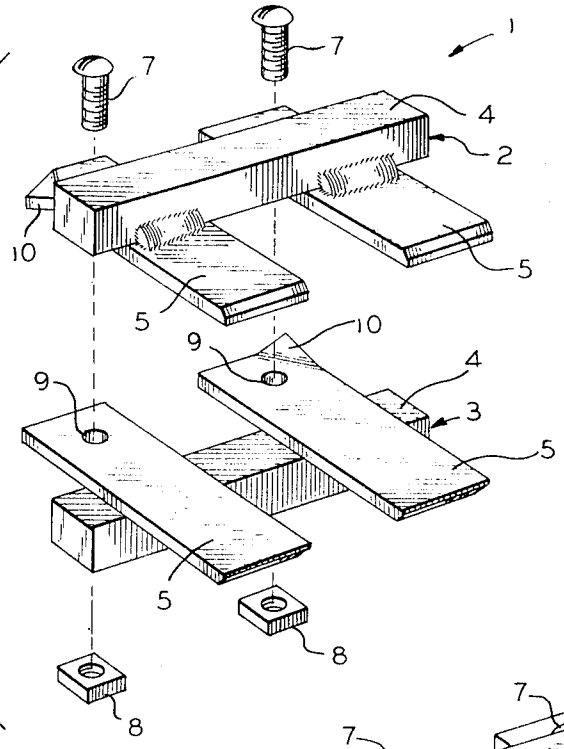


FIG. 1



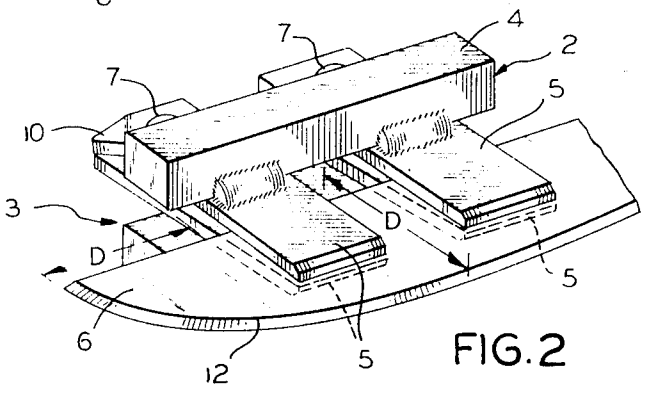


FIG. 2

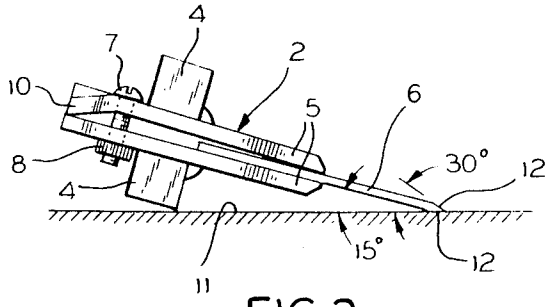


FIG. 3

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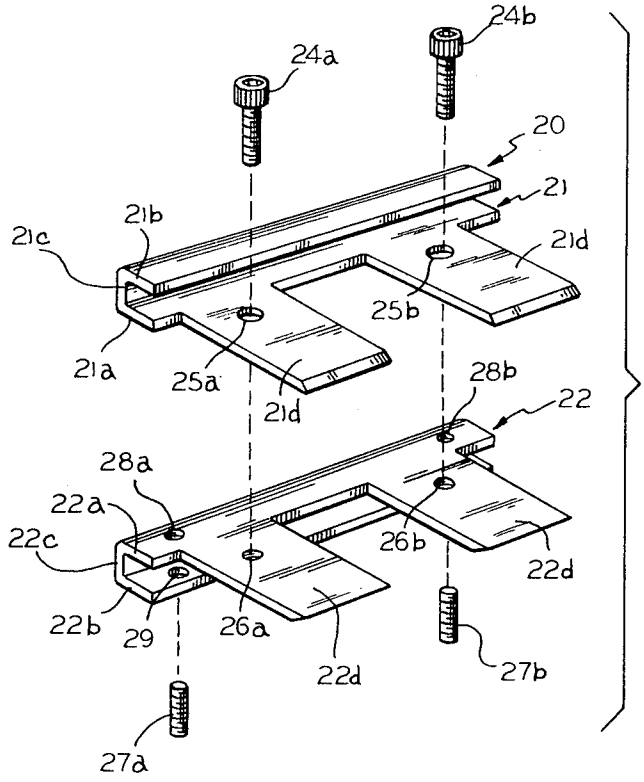


FIG.4

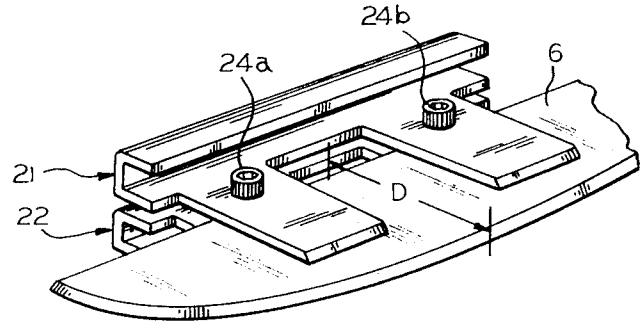


FIG.5

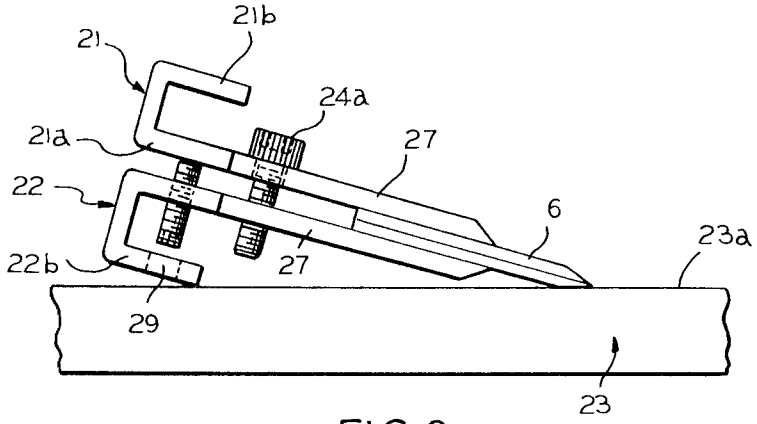


FIG.6

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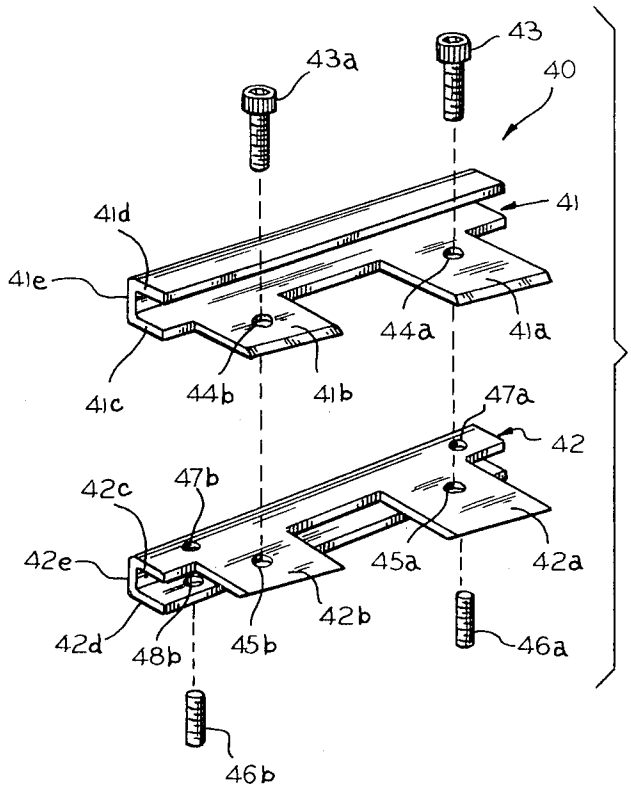


FIG. 7

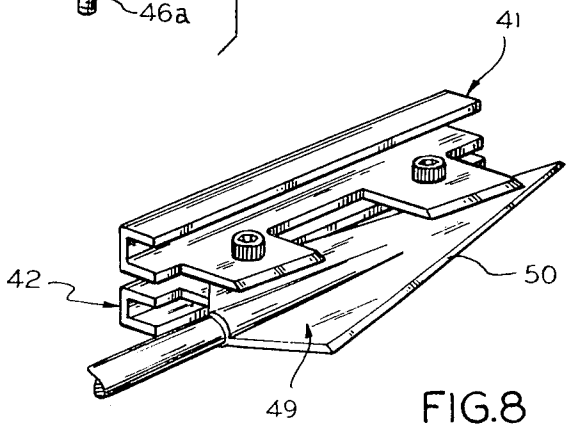


FIG. 8

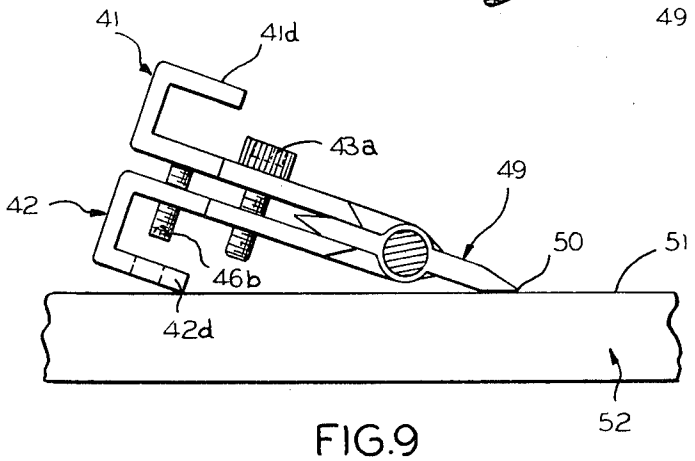


FIG. 9

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BLADE SHARPENING GUIDE

This application is a continuation-in-part of my co-pending application Ser. No. 757,952, filed Sept. 6, 1968, now abandoned.

This invention is directed to a clamp-type knife blade holder, capable of being used effectively by an unskilled person, which accurately establishes the sharpening angle for the edge of a knife blade to be sharpened on a flat surface and which enables the sharpening of a blade edge to razor edge sharpness. The blade holder is adjustable, and can be set for different sharpening angles, and for handling knife blades of various sizes. A pair of positioning or guide bars extend along each side of the holder, in the same direction as the long axis of a blade clamped to the holder to establish an identical sharpening angle on both sides of the blade edge as the blade and holder are stroked over a flat sharpening surface, such as a hone. It is not necessary to reclamp the blade during the sharpening process to sharpen both sides of the blade edge, because the blade and holder may simply be flipped over, there being guides on both sides of the blade holder. The blade holder may also be used to sharpen a scissors, and a slightly modified form is useful for sharpening arrowheads.

Blade sharpeners of many designs are well known. One of these is shown in U.S. Pat. No. 1,505,678, which issued Aug. 19, 1924 to F. B. Swisher. That device comprises a simple bar for sharpening scissors, the sharpening motion being created by closing the scissors on the bar. No angle control, other than that built into the scissors, and no blade holder is provided by the Swisher tool.

U.S. Pat. No. 1,152,321 which issued Aug. 31, 1915 to R. E. Kimball, describes a blade sharpener, which does include a blade holder. However, Kimball's apparatus is used in combination with a holder which carries a pair of rotatable sharpening steels. The blade holder and the holder for the sharpening steels are interconnected by means of a frame, so that the angle of the rotating steels can be fixed relative to the blade. In addition, the apparatus must be secured to a table or similar support to hold it in place while the hand crank of the rotary holder is rotated.

An even more elaborate blade sharpening jig is described in U.S. Pat. No. 3,011,366, which issued Dec. 5, 1961, to J. N. Sandven et al. The jig includes adjustable holding means for a blade, in combination with rollers over which a sharpening file is moved.

The apparatus of the invention comprises two complementary blade clamps with interconnecting means for use on a sharpening surface. The sharpening surface can be a hone or sharpening stone, or a sharpening steel, and it is preferably flat.

The present invention is more simple than the Kimball and Sandven et al. sharpening devices. In the instant device, it is only necessary to clamp the blade properly in the blade holding-clamp, and the angle determining guide bars automatically establish the correct sharpening angle for both sides of the blade edge during each stroke on a hone. In the typical blade sharpening operation to obtain a precision sharpened blade edge, it is only necessary to move the clamped blade on the sharpening surface a sufficient number of times, with the respective side edge surfaces of the blade and the angle bars resting against the sharpening surface.

The best mode presently contemplated of carrying out the invention is illustrated in the accompanying drawings in which:

FIG. 1 is an exploded perspective view of the knife sharpening guide of the invention;

FIG. 2 is a side perspective view of the device, showing a knife blade to be sharpened held thereby;

FIG. 3 is an end view of the device, showing the blade angle relative to the sharpening surface;

FIG. 4 is an exploded perspective view of a modified knife sharpening guide of the invention;

FIG. 5 is a side perspective view of the guide shown in FIG. 4 and showing a knife blade to be sharpened as it is held thereby;

FIG. 6 is an end elevational view of the guide of FIG. 4, showing a blade angle relative to the sharpening surface;

FIG. 7 is an exploded view of a modified sharpening guide for use in sharpening arrowheads or broadheads in accordance with the invention;

FIG. 8 is a side perspective view of the guide of FIG. 7, illustrating a broadhead clamped by the guide and ready to be sharpened; and

FIG. 9 is an end view of the guide shown in FIG. 7, illustrating the broadhead angle relative to the sharpening surface.

It is not possible for the average person to attain a constant relationship between a blade and sharpening surface during sharpening of a blade, and therefore the average person cannot obtain a sharpened razor edge on a blade. The present invention permits any person, whether skilled or not in sharpening, to obtain a razor sharp cutting edge on a blade.

As shown in the drawings, a knife sharpening guide **1** includes a first blade guide clamp **2**, and a second blade guide clamp **3**. The guide clamps **2** and **3** each include an angle guide bar **4**, to which is welded a pair of blade clamps **5**, which grip and hold a knife blade **6**. While the guide bars **4** are shown as being straight, it should be recognized they could also be arcuate. The first and second blade guide clamps **2** and **3** are secured to each other by threaded bolts **7** and nuts **8**. The bolts **7** each extend through openings **9** in the respective blade clamps **5**. The bolt openings **9** are preferably disposed at the back portion of the clamps **5** as shown, but could be located on the opposite side of the respective guide bars **4** without impairing the function of the apparatus.

The blade clamps **5** extend at right angles relative to the respective angle guide bar **4**, and each has a bent corner **10** to provide spring tension gripping action on the blade **6** to hold it firmly in the sharpening guide **1**.

The position of the blade **6** in the guide clamps **2** and **3** can, of course, be adjusted to provide the desired sharpening angle, and because the guide clamps **2** and **3** are complementary, matching elements, it is not necessary to change the clamping position to sharpen the opposing side edges of the blade **6**. When attaching the blade guide to a knife blade, it is positioned so that the clamps are generally centered between the ends of the blade and where about one-half inch extends between the blade edge and the clamps. Moreover the guide bars of the holder are set generally parallel to the blade edge. The optimum sharpening angle which is the angle between the blade and hone, in most instances, is between fifteen and twenty degrees, and the desired angle can be obtained by changing the distance "D," between the blade edge and the bar **4**.

Once the blade **6** has been clamped into the knife sharpening guide **1**, it is not necessary to unclamp and reclamp it during the sharpening operation. The fifteen degree angle is automatically established for both sides, thereby providing a total angle or edge angle between the planes of the sharpened blade edges of thirty degrees. The sides of the guide clamps **2** and **3** may be marked with desired settings as to positioning of the blade clamps relative the knife blade for a plurality of blade sizes to facilitate consistent placement of the blade relative the guide.

Sharpening surface **11** is a sharpening stone, commonly called a hone, or a sharpening steel, and it is preferably flat. The sharpening action is accomplished by holding either blade edge **12** of blade **6** and the corresponding angle guide bar **4** against the sharpening surface **11**, and drawing the blade **6** along relative to the surface **11** with a wiping action by moving the blade in a direction with the blade cutting edge leading while maintaining the guide bar in engagement with the hone. This motion is repeated, until the respective edges **12** generate a sharp cutting edge.

The device has particular utility in meat processing, where the intuitive skill connected with the manual sharpening art is becoming rare. No period of training or apprenticeship is necessary to become an "expert" blade sharpener. Any supermarket employee (or sportsman) who can follow simple instructions can obtain a correctly sharpened edge at first attempt.

Referring now to the embodiment of FIGS. 4–6, a modified knife sharpening guide or sharpener and the preferred embodiment, generally indicated by the numeral 20, is illustrated and differentiates from the embodiment of FIGS. 1 to 3 only in the structural details. The guide of this embodiment includes a pair of substantially identical frame members 21 and 22, adapted to be arranged together in mirror relationship to clamp the knife 6, so that it may be sharpened on the sharpening surface 23*a* of a sharpening stone or steel 23.

Frame member 21 includes a channel-shaped guide head or bar having substantially parallel opposed walls 21*a* and 21*b* interconnected by a wall 21*c* which extends substantially normal thereto, and a pair of identical clamping fingers 21d extending coplanar from the wall 21*a*. The clamping fingers extend from the free edge of the wall 21*a* and in substantially parallel relationship to each other. While the walls 21*a* and 21*b* are of substantially equal size, it should be appreciated that either may be longer than the other if so desired. The frame members are suitably formed from a metal capable of rigidly and firmly clamping a knife blade and holding same in the same position during the entire blade sharpening procedure. Similarly, frame member 22 includes connected walls 22*a*, 22*b* and 22*c*, and clamping fingers 22d extending from wall 22*a*.

The frame members 21 and 22 are fastened together in clamping relation by a pair of cap screws 24*a* and 24*b* which extend freely through openings 25*a* and 25*b* in the clamping fingers 21d of frame member 21 and are adapted to be threadedly received in tapped openings 26*a* and 26*b* formed in the clamping fingers 22*d* of the other frame member 22. Thus, the heads of the cap screws 28 bear against the outer surface of fingers 21*d* and draw the upper frame member toward the lower frame member as the cap screws are turned into the tapped openings 26*a* and 26*b*.

Inasmuch as the thickness of knife blades will vary, means is provided for adjusting the clamping relationship between the frame members when in clamping position with a knife blade so that the clamping fingers of each frame member are essentially parallel to the blade surfaces engaged when in clamping position as shown in FIG. 6. This means includes a pair of setscrews 27*a* and 27*b* which are threadedly received in tapped holes 28*a* and 28*b* formed in the wall 22*a* of the frame member 22 so that they may bear against the surface of the wall 21*a* of the other frame member, as shown in FIG. 6. Access holes 29 are provided in the wall 22*b* in alignment with the setscrews to facilitate the entry of a tool for engaging and turning the setscrews when making the necessary adjustment of the sharpening guide. The points of the setscrews, together with the heads of the capscrews coact to regulate the angular relationship of the opposed clamping fingers when in clamping position with a knife. Thus, knives with parallel and non-parallel sides can be gripped properly. It should be recognized that the setscrews could be mounted as well in the other frame member.

The operation of the embodiment of FIGS. 4, 5 and 6 is identical to that of FIGS. 1 to 3 following the proper clamping of a knife blade. The desired sharpening angle for the knife blade or edge angle for the cutting edge may be obtained by adjusting the distance "D," which is the distance extending between the blade edge and the angle guide bar. In this embodiment, the angle guide bar is defined by the extension from the walls 21*a* in the form of the walls 21*b* and 21*c* for frame member 22, and as seen particularly in FIG. 6, wherein the wall 22*b* guides along the sharpening surface or hone 23 during sharpening of the blade 6 to maintain the consistent relationship between the blade edge face and hone.

The sharpening guide of the invention can also be used to sharpen other cutting edges in addition to knives. For example the blade members of arrowheads, sometimes called broadheads and used by archers, may be readily sharpened by using the sharpening guide of the invention in combination with a flat sharpening surface, as shown in the embodiments of FIGS. 7 to 9. The sharpening guide of this embodiment is generally designated by the numeral 40 and differs from the guide of FIGS. 4 to 6 only in the length of the clamping fingers so as to facilitate the clamping to a broadhead 42 in a desired fashion.

The broadhead guide and holder 40 includes frame members 41 and 42 which are the mirror image of each other. The heads of the frame members are channel-shaped to define a base for clamping fingers 41*a* and 41*b*, and to define means for maintaining the broadhead edge being sharpened at a constant angle relative the sharpening surface during the sharpening operation.

The head of frame member 41 includes a wall 41*c* coplanar with the clamping fingers 41*a* and 41*b*, a guide wall 41*d* substantially parallel to the wall 41*b* and spaced outwardly therefrom, and a connecting wall 41*e*. Similarly, the frame member 42 includes walls 42*c*, 42*d* and 42*e*.

While the sharpening guide of FIGS. 4 to 6 may be used to sharpen a broadhead, it will be appreciated that the sharpening guide 40 where clamping fingers 41*a* and 42*a* are longer than clamping fingers 41*b* and 42*b*, facilitate clamping of the broadhead in the fashion shown in FIG. 8 to generally place the broadhead edge in parallel relationship to the guide bars. For the same reason, the free edges of the clamping fingers of each frame member are formed at an incline relative the longitudinal axis of the head or guide bar.

As in the embodiment of FIGS. 4 to 6, cap screws 43 and 43*a* freely received in holes 44*a* and 44*b* of clamping fingers 41*a* and 41*b*, and threadedly received in tapped holes 45*a* and 45*b* of clamping fingers 42*a* and 42*b*, serve to selectively move the frame members 41 and 42 toward and away from each other into clamping and unclamping positions. The heads of capscrews 43 and 43*a* bear against the outer surface of clamping fingers 41*a* and 41*b* during the clamping of a broadhead between the coacting fingers of each frame member.

Inasmuch as the thickness of all broadheads cannot be expected to be the same, and the best clamping action attainable is accomplished when the broadhead engaging surfaces of the clamping fingers are essentially parallel to the broadhead engaging surface to provide the most clamping surface, adjustable setscrews 46*a* and 46*b* are mounted on the frame member 42 with their working ends adapted to engage against the wall 41*c* of the frame member 41, as shown particularly in FIG. 9. The setscrews 46*a* and 46*b* are threadedly received in tapped openings 47*a* and 47*b* formed in the wall 42*c* of the frame member 42, and to facilitate turning and adjusting of the setscrews, holes are provided in alignment therewith in the opposing wall 42*d*, such as shown by hole 48*b* to permit entry of a tool for engaging the head of the setscrews. The setscrews 46*a* and 46*b* are arranged to provide point contact with the frame member 41 at points spaced from the positions of the capscrews 43 and 43*a* to coact therewith in maintaining the clamping fingers of the frame members essentially parallel during the clamping operation.

The sharpening angles of the broadhead, generally designated by the numeral 49, having a sharpened edge 50 is preferably between 15° and 20° relative to the planar axis of the broadhead, and preferably about 15° whereby the angle between the opposed sharpened surfaces of an edge is about 30°. Changing the spacing relation between the edge 50 and the guide bars of the frame members will enable the changing of the sharpening angle. Once the broadhead is mounted on the guide and holder, it may be wiped or stroked across the sharpening surface 51 of the sharpening member 52 in the same manner already described in connection with sharpening a knife blade, and as seen in FIG. 9, the particular wall 41*d* or 42*d* of the frame members 41 and 42 will coact with the broadhead in engaging the sharpening surface to maintain a constant angle of sharpening relative to the sharpening surface during the sharpening function.

It will be understood that modifications and variations may be effected without departing from the scope of the novel concepts of the present invention.

I claim:

1. A blade sharpener adapted to be used for sharpening the cutting edge of a blade by moving the edge faces against a surface of a sharpening member, said sharpener comprising, a pair of substantially identical frame members arranged

together in mirror image relationship to clamp and guide a blade during sharpening of the cutting edge on a sharpening surface to obtain a given edge angle, each said frame member including a plurality of clamping fingers having clamping faces adapted to engage the side of a blade, the fingers of one frame member aligning with the fingers of the other frame member to define a plurality of sets of clamping fingers between which the blade is clamped, an elongated bar-shaped guide member projecting outwardly from the plane of the fingers such that a guide member is provided on both sides of the sharpener, said elongated bar-shaped guide members adapted to extend substantially parallel to the cutting edge of the blade and engage the sharpening surface to guide generation of the edge angle in sharpening the cutting edge, first means at each set of clamping fingers for bringing said frame members toward and away from each other into blade clamping and unclamping positions and for adjusting said fingers to clamp blades of various thicknesses, and second means coacting with each said first means to adjust the relative planar relation of the clamping faces of each set of clamping fingers into essentially parallel relation with respect to the sides of the blade clamped thereby.

2. A blade sharpener as defined in claim 1, wherein said first means includes cap screws having heads engaging one of the frame members and shanks threadedly received by the other of the frame members.

3. A blade sharpener as defined in claim 1, wherein said second means includes set screws threadedly received in one of the frame members and bearing against the other of the frame members.

4. A blade sharpener as defined in claim 2, wherein said second means includes set screws threadedly received in one of the frame members and bearing against the other of the frame members.

5. A blade sharpener as defined in claim 1, wherein the length of each set of clamping fingers is equal.

6. A blade sharpener as defined in claim 1, wherein the length of one set of clamping fingers is longer than another set.

7. A blade sharpener adapted to be used for sharpening the cutting edge of a blade by moving the edge faces against a surface of a sharpening member, said sharpener comprising, a pair of substantially identical frame members arranged together in mirror image relationship to clamp and guide a blade during sharpening of the cutting edge on a sharpening surface to obtain a given edge angle, each said frame member including a pair of spaced coplanar clamping fingers each having a clamping face adapted to engage the side of a blade, a web portion extending between the fingers at one end, the fingers of one frame member aligning with the fingers of the other frame member to define a pair of sets of clamping fingers between which the blade is clamped, an elongated bar-shaped guide member projecting outwardly from the web portion such that a guide member is provided on both sides of the sharpener, said elongated bar-shaped guide members adapted to extend substantially parallel to the cutting edge of the blade and engage the sharpening surface to guide generation of the edge angle in sharpening the cutting edge, first means at each set of clamping fingers for bringing said frame members toward and away from each other into blade clamping and unclamping positions and for adjusting said fingers to clamp blades of various thicknesses, and second means coacting with each said first means to adjust the relative planar relation of the clamping faces of each set of clamping fingers into essentially parallel relation with respect to the sides of the blade clamped thereby.

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