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[54] SHARPENER FOR ARROWHEADS

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[52] **U.S. Cl.** **76/88,** 269/3

[51] **Int. Cl.** **B21k 5/12**

[58] **Field of Search** ..... 51/173, 221 R; 269/1, 2, 3, 6, 87.3, 87.2, 87.1, 321 P; 76/82, 82.2, 88

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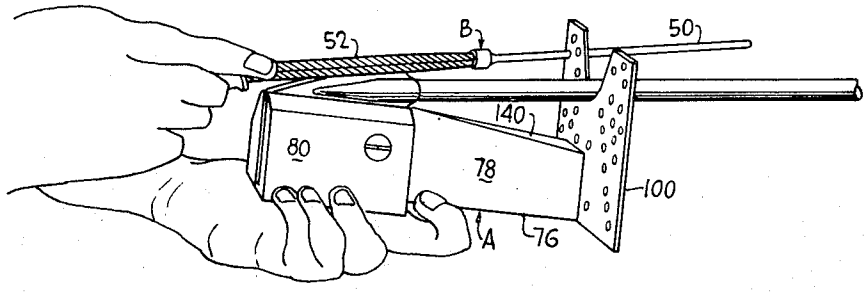
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[57] **ABSTRACT**

An arrow broadhead sharpener to be held in one hand of an operative and comprising clamp members between which one blade of an arrowhead, another blade of which is to be sharpened or resharpened, is secured and a tool guide member extending transversely of the clamp members having apertures therein in which one end of a sharpening instrument or tool, such as, a file, stone, etc., is received while the other end is held by the other hand of the operator and moved over the cutting edge of the blade to be sharpened or resharpened.

6 Claims, 5 Drawing Figures



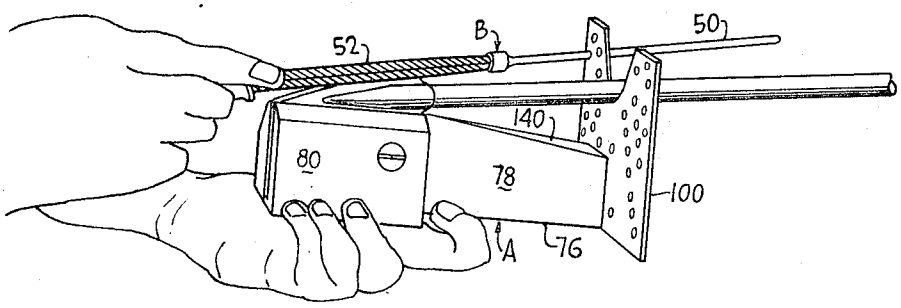


FIG. 1

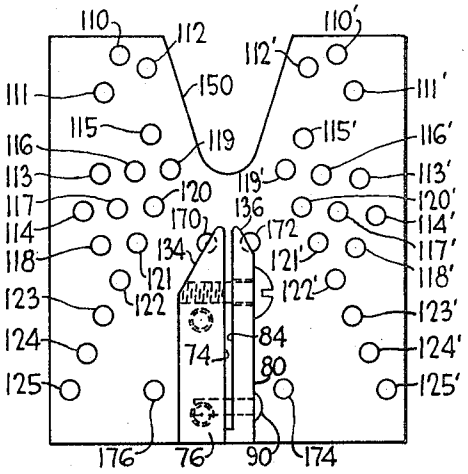


FIG. 3

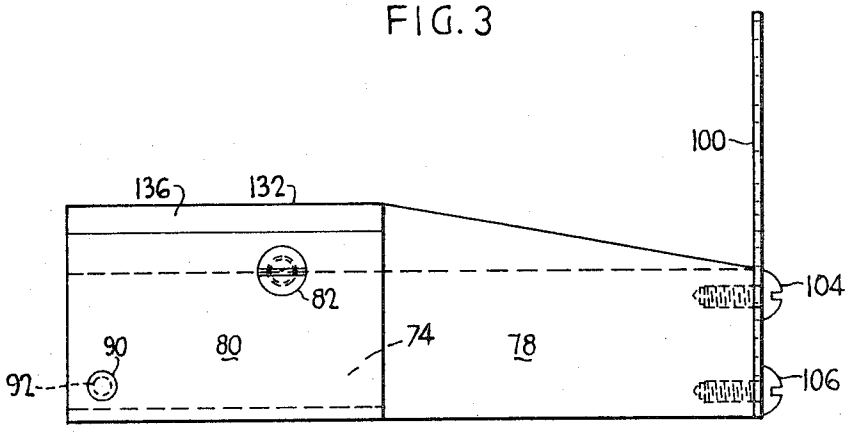


FIG. 2

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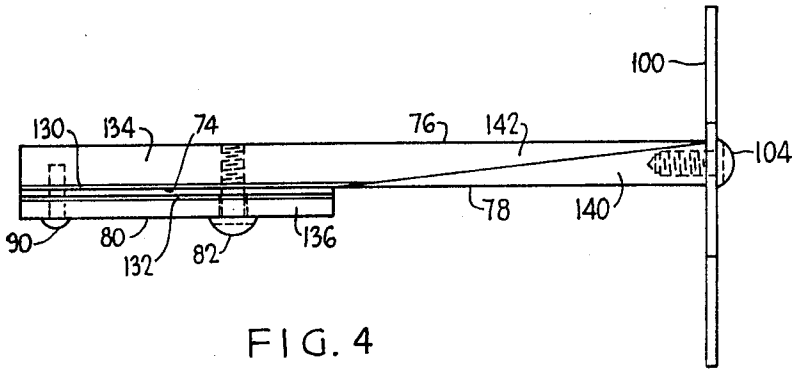


FIG. 4

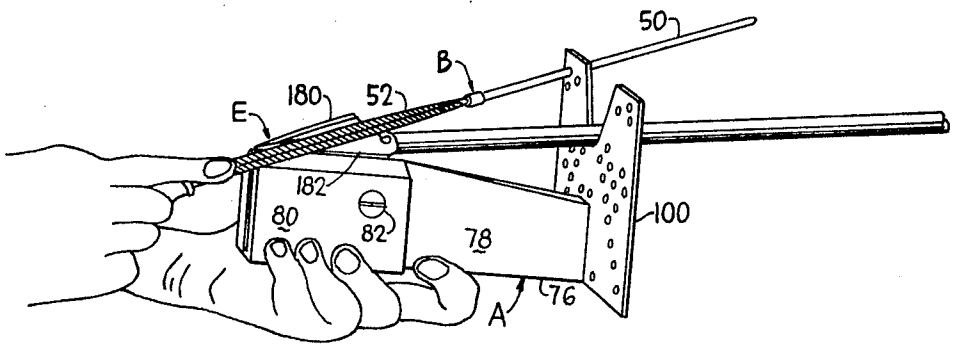


FIG. 5

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SHARPENER FOR ARROWHEADS

FIELD OF INVENTION

The present invention relates to archery.

PRIOR ART

Typically, steel arrow broadheads are sharpened or resharpened in the field by being held in one hand while a sharpening tool, such as, a stone or file, held in the other hand is moved over the cutting edge. Because of the difficulty of maintaining the proper relationship between the blade being sharpened and the tool the results are usually very unsatisfactory.

SUMMARY OF INVENTION

The present invention provides a novel arrow broadhead sharpener, simple in construction, inexpensive to manufacture and comprising a member having a clamp element associated therewith for securing one blade of the arrowhead thereto, a different blade of which is to be sharpened and a guide for a cooperating sharpening tool. The sharpener can be conveniently held in one hand while a sharpening tool, held in the other hand of the operative, is moved over the cutting edge of the blade to be sharpened or resharpened with minimum risk to the operator. The sharpening tool is positioned with respect to the cutting edge of the blade of the arrow being sharpened by the guide of the sharpener.

The invention further provides a novel portable sharpener for steel arrow broadheads having two, three or four blades which is so constructed that it can be conveniently carried by a person for field use.

Further objects and advantages of the invention will be apparent from the following description of two preferred embodiments thereof described with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of one embodiment of the present invention illustrating how the sharpener shown can be used to sharpen a double-blade steel arrow broadhead;

FIG. 2 is a side elevational view of the holder of the sharpener shown in FIG. 1;

FIG. 3 is a right-hand end elevational view of the holder shown in FIG. 2;

FIG. 4 is a plan view of the holder shown in FIG. 2; and

FIG. 5 is a view similar to FIG. 1 but illustrating use of the sharpener for sharpening a triple-bladed arrow broadhead.

DESCRIPTION OF PREFERRED EMBODIMENT

The sharpener shown in FIGS. 1 to 5 of the drawings comprises an arrow broadhead holder or clamp assembly designated generally by the reference character A adapted to be held in one hand by an operative in the manner illustrated in FIG. 1 while a sharpening tool or instrumentality designated generally by the reference character B adapted to be held in the other hand and moved over the cutting edge of a blade to be sharpened of a steel arrow broadhead C of an arrow D. The path of the tool relative to the cutting edge being sharpened is in part determined by a guide on the holder for the far end of the tool B, as viewed in FIG. 1.

The tool B of the illustrated sharpener comprises a three-cornered file **52** having an internally threaded

ferrule **54** fixedly secured to the one end thereof and into which a threaded extension **56** on the one end of the cylindrical member **50**, previously referred to, is adapted to be screwed for detachably connecting the members **50, 52.** The end of the file **52** opposite the cylinder extension **50** has a conventional hand grasp **60** fixedly secured thereto. The free end of the hand grasp **60** is preferably provided with a screwdriver-like blade **62.**

The arrow or arrow broadhead holder A, comprises a plate-like base member **76** having a planar near side **78,** a portion **74** of which adjacent to one edge constitutes the fixed jaw of the clamp assembly. A second plate-like member **80** is movably connected to the member **76** as by the screw **82** threaded into a tapped aperture in the member **76** and has a planar surface **84** which, or a portion of which adjacent one, edge forms the movable jaw of the clamp assembly or arrowhead holder. The members **76, 80** are rectangularly shaped plate-like members but they may be of any shape suitable for clamping one blade of an arrow broadhead and of being held in one hand of an operative. The member **76** is provided with a pin **90** projecting through an aperture **92** in the member **80** spaced from the screw **82** for limiting rotation of the member **80** about the screw **82.**

The arrow holder A includes a plate-like member **100** connected to the far end of the member **76,** as viewed in FIG. **1,** by screws **104, 106** threaded into suitable tapped apertures in the member **76.** The member **100** extends at right angles with respect to the planar or clamp surface **78** of the member **76** and is provided with a plurality of pairs of tool guiding apertures **110** and **110′, 111** and **111′, 112** and **112′, 113** and **113′, 114** and **114′, 115** and **115′, 116** and **116′, 117** and **117′, 118** and **118′, 119** and **119′, 120** and **120′, 121** and **121′, 122** and **122′, 123** and **123′, 124** and **124′, 125** and **125′** for receiving and guiding the cylindrical end portion **50** of the tool B.

The apertures of the respective pairs of guide apertures, referred to, are preferably equally spaced from opposite sides of a plane parallel with at least the clamp part **74** of the surface **78** but spaced therefrom toward the member **80** an amount approximately one-half the thickness of an arrowhead blade and the apertures of the respective pairs are also equally spaced from the plane of the edges or surfaces **130, 132** projected to the member **100.** The two planes referred to may be two of the three planes of a right trihedron the third plane of which is the plane of the part **100.** In other words, the aperture of each pair are symmetrical with respect to three planes intersecting one another at right angles, one of which is parallel with the surface **78** of the member **76** and spaced therefrom an amount equal to half the thickness of an arrow blade, another the plane of the member **100,** and the third the plane of the surfaces **130, 132** or one parallel therewith.

The upper edge of the member **76,** as viewed in the drawings, which is coextensive with the upper edge of the member **80** is beveled as indicated by the reference character **134** and the opposite edge of the member **80** is beveled in like manner as indicated by the reference character **136.**

The upper edge **140** of that part of the member **76** which is not coextensive with the member **80** slopes downwardly towards the member **100** and the rear side thereof, as viewed in FIG. **1,** is beveled, as indicated by the reference character **142.** The sloping edge **140** and

the bevels **134, 136** and **142** are provided to assure adequate clearance for the cutting tool irrespective of the type of arrowhead being sharpened.

The sharpener is, as previously mentioned, designed and used in sharpening different types of arrow broadheads, for example, heads having two, three or four blades, etc. For this purpose and to provide for different bevels at the blade edges the member **100** is provided with a plurality of guide apertures as previously mentioned. The apertures mentioned are in pairs and are symmetrical with respect to the cutting edge of an arrowhead blade being sharpened. In addition to the apertures referred to the member **100** is provided with a V- shaped aperture **150** opening into the upper edge of the plate **100.** This aperture is provided for receiving the shaft of an arrow, the head of which is to be sharpened as illustrated in the drawings and the center line thereof is preferably in the plane previously referred to parallel with at least the part **74** of the surface **78** of the member **76** but offset therefrom one-half the thickness of the blade. As previously mentioned, blades are typically 0.044 inch thick.

The manner of sharpening a two-bladed arrow head, using the sharpener of the present invention, is illustrated in FIG. **1.** As shown in this figure the cylindrical end **50** of the tool B is placed in one of the guide holes in the member **100,** for example, the guide apertures, designated **112.** With the end of the tool in one of the apertures referred to, the sharpening portion per se is moved over the cutting edge of the upper blade of the broadhead in a well understood manner. The other blade of the arrowhead is secured between the clamped members **76, 80.** To sharpen the other side of the cutting edge of the upper blade the extension **50** of the sharpening tool is moved to the hole **112'** which is symmetrical with the hole **112** with respect to a plane parallel with and offset from the surface **74** of the member **76** an amount equal to about one-half the thickness of the blade of the arrowhead. Depending upon the bevel desired on the cutting edge of the blade being sharpened, the tool can be inserted alternately in other pairs of guide apertures provided.

The guide holes, previously referred to, are preferably arranged in series with the holes of the respective series forming a straight line, making a predetermined angle with the plane previously referred to, parallel with the part **74** of the surface **78** of the member **76** and offset therefrom toward the member **80** an amount equal to about one-half the thickness of an arrow broadhead blade. In the embodiment shown, apertures **110, 111** constitute one series; **112, 113, 114,** a second series; **115** to **118,** a third series, and **119** to **125,** a fourth series. The apertures of the four series referred to are parallel with one another and make an angle of about 25° with the plane previously mentioned. Alternatively, other suitable angles could be employed and the angles of the respective series could vary from one another in any desired manner.

In addition to the guide apertures previously mentioned, the member **100** may be provided with random guide apertures such as the apertures **170, 172, 174, 176,** which may be used to obtain different effects on the blade being sharpened. Some arrow broadheads have merely one side of their blades beveled, in which event it is merely necessary to utilize the guide apertures on the proper side of the member **76.** It is also to be understood that if different bevels are desired on different sides of the broadhead blade or on different parts of the same broadhead blade, an appropriate guide aperture can be chosen.

The manner of sharpening a three-bladed arrow broadhead E is illustrated in FIG. **10.** In this instance the blades **180, 172** of the broadhead E projecting from the holder, are at angles of 60° to the planes of the clamping surfaces **74, 84** of the members **76, 80.** In the illustration the end of the tool B is inserted in the guide aperture **110** of the pair of guide apertures **110** and **110'** above the bottom of the aperture **150.** In this instance, after one side of the two exposed blades, that is, the blades other than the blade clamped between the members **76, 80** have been sharpened the broadhead is reclamped using different blades to complete the sharpening.

From the foregoing description it will be apparent that the objects of the invention heretofore enumerated and others have been accomplished and that there has been provided a novel and improved sharpener which can be conveniently used in the field to sharpen arrow broadheads. The sharpener can also be employed to produce various desired bevels on the cutting edge of a blade of an arrow broadhead. While preferred embodiments of the invention have been described in the considerable detail, it is to be understood that the invention is not limited to the particular construction shown, and that it is the intention to hereby cover all adaptations, modifications and uses thereof which come within the practice of those skilled in the art to which the invention relates and the spirit and scope of the appended claims.

Having thus described my invention, what I claim is:

1. In a sharpener for arrow broadheads having at least two blades, an arrow broadhead holder adapted to be held in one hand by an operative for supporting an arrow broadhead by engagement with a blade other than the blade to be sharpened and comprising a first clamp member having a first surface for engaging one side of an arrow broadhead blade, a second clamp member having a second surface opposed to said first surface of said first clamp member for engaging the other side of the blade, means for moving said clamp members toward one another for releasably clamping a blade of an arrow broadhead therebetween, and a plate-like guide means carried by said first clamp member and extending at right angles with respect to said first surface and provided with at least one tool receiving aperture therethrough on each opposite side of and symmetrically located with respect to a plane parallel to the plane of said first surface but spaced slightly therefrom towards said second clamp member so as to be substantially symmetrically located relative to a blade clamped between said first and second clamp members.

2. In a sharpener for steel broadhead arrowheads having at least two blades, an arrow broadhead holder for supporting an arrow broadhead by engagement with a blade other than the blade to be sharpened and comprising a first clamp member adapted to be held in one hand by an operative and having a first surface for engaging one side of an arrow broadhead blade, a plate-like guide means connected to said first clamp member and extending at right angles with respect to said first surface, a second clamp member having a second surface opposed to said first surface of said first clamp member for engaging the other side of the blade, and

means for moving said clamp members toward one another for releasably clamping a blade of an arrow broadhead therebetween, said guide means having a shaft engaging means formed thereon substantially aligned with said surfaces for receiving the shaft of a broadhead arrow at least one blade of the broadhead of which is to be sharpened and at least one tool receiving aperture through said guide means on each opposite side of and located substantially symmetrical with reference to said shaft engaging means.

3. In a sharpener for broadhead arrowheads having at least two blades, an arrow holder adapted to be held in one hand by an operative for supporting an arrow broadhead by engagement with a blade other than the blade to be sharpened and comprising a first clamp member having a first surface for engaging one side of an arrow broadhead blade, a guide member connected to said first clamp member and extending at right angles with respect to said first surface, a second clamp member having a second surface opposed to said first surface of said first clamp member for engaging the other side of the blade and means for moving said clamp members toward one another for releasably clamping a blade of an arrow broadhead therebetween, said guide member having shaft engaging means formed thereon substantially aligned with said surfaces for receiving the shaft of a broadhead arrow at least one blade of the broadhead of which is to be sharpened and a plurality of pairs of tool receiving apertures through said guide member, the apertures of each pair being on opposite sides of and located substantially symmetrical with reference to a plane parallel with said first surface but offset towards said second surface so as to be substantially symmetrically located relative to a blade clamped between said first and second clamp members.

4. In a sharpener for arrow broadheads having at least two blades, an arrow holder assembly adapted to be held in one hand by an operative for supporting an arrow broadhead by engagement with a blade other than the blade to be sharpened and comprising a first clamp member having a surface for engaging one said of a blade of an arrow broadhead, guide means extending at right angles with respect to said surface and provided with at least one tool receiving aperture therethrough on each opposite side of and located substantially symmetrical with respect to the plane of said first surface, a second clamp member having a second surface opposed to said first surface of said first clamp member for engaging the other side of the blade, and means for moving said clamp members toward one another for releasably clamping a blade of an arrow broadhead therebetween, and an arrow broadhead blade sharpening tool, having one end adapted for selective extension through said apertures in said arrow holder assembly with the other end held by the other hand of the operative and reciprocation in contact with selective sides of the cutting edge of a blade to be sharpened of the arrow broadhead clamped in said holder assembly.

5. A sharpening device adapted to be held in one hand by an operative for sharpening arrow broadheads having at least two blades arranged symmetrically about the axis of an arrow shaft, comprising clamping means including a pair of clamping members with opposed surfaces movable toward and away from each other for releasably clamping an arrow broadhead by a blade other than the blade which is to be sharpened, means for moving said clamping members toward one another to releasably clamp an arrow broadhead blade therebetween, guide means carried by one of said clamping members and exteing at right angles with respect to said surfaces, and tool engaging means formed on said guide means on opposite sides of said surfaces for supporting a tool at either of two positions spaced symmetrically on opposite sides of a blade of an arrow broadhead clamped between said clamping members.

6. A sharpening device adapted to be held in one hand by an operative for sharpening arrow broadheads having at least two blades arranged symmetrically about the axis of an arrow shaft, comprising clamping means including a pair of clamping members with opposed surfaces movable toward and away from each other for releasably clamping an arrow broadhead by a blade other than the blade which is to be sharpened, means for moving said clamping members toward one another to releasably clamp an arrow broadhead blade therebetween, guide means carried by one of said clamping members and extending at right angles with respect to said surfaces, tool engaging means formed on said guide means on opposite sides of said surfaces for supporting a tool at either of two positions spaced symmetrically on opposite sides of a blade clamped between said clamping members, and shaft engaging means formed on said guide means for engaging and supporting the shaft of an arrow one blade of the broadhead of which is clamped between said clamping members so as to position a blade to be sharpened at a desired attitude relative to said clamping means and said guide means.

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