

PATENT SPECIFICATION

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(54) IMPROVEMENTS IN OR RELATING TO BLADE SHARPENING DEVICES

(71) We, WILTSHIRE CUTLERY COMPANY PROPRIETARY LIMITED of 36—38 Albert Road, South Melbourne, Victoria, Australia, a company incorporated under the laws of the State of Victoria, Australia, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to blade sharpener and scabbard combinations.

A particular disadvantage of conventional knife sharpeners is that the actual sharpening elements lose their effectiveness over a period of time, and it is generally inconvenient if not impossible to repair or adjust those elements so as to counter such degradation. It is a principal object of the present invention to provide a blade sharpener and scabbard combination which is arranged to permit the relative positions of the sharpening elements to be altered or adjusted so that their effective life may be extended.

In accordance with the present invention there is provided a blade sharpener and scabbard combination including; a housing having a blade receiving passage therein; an access opening at one end of said passage; and a sharpening device connected to said housing adjacent said access opening and having two sharpening elements each defining a respective sharpening edge, said elements being arranged in crossed relationship so that said sharpening edges extend angularly relative to each other and define a sharpening recess between them, mounting means comprising a pair of arms and an integral base section interconnecting said arms at one end, a respective one of said sharpening elements being formed by or attached to an end portion of each said arm remote from said base section, and at least one zone of each said arm adjacent said base section being resilient to permit

said recess to be widened by separation of said elements and to urge said elements towards each other from such a separated position; said recess being in alignment with said passage so that said sharpening edges are engageable with respective opposite sides of a blade received, in use, within said passage.

The sharpening elements may be made from a relatively hard material such as tungsten carbide, or an abrasive material.

The sharpening recess defined between the two elements may be of substantially V-shape, and a knife blade is sharpened by location of the blade cutting edge within the apex of the recess and then moving the blade longitudinally across the sharpening elements.

It will be appreciated that continued sharpening will result in the sections of the sharpening edges in the apex of the recess becoming dull or blunt so that their effectiveness is progressively reduced. In order to counter that effect, a sharpener of the combination in accordance with the invention is arranged so that the sharpening elements are mounted for relative movement in a manner such that the size or configuration of the sharpening recess can be varied during use. In particular, the sharpening elements are arranged to be separated in response to pressure applied by a knife blade during a sharpening operation, so that the depth of the sharpening recess is increased, and the section of each sharpening edge which actually functions to sharpen the knife blade varies in accordance with variations in the depth of the recess. As a result, the sharpening function is performed over a length of each sharpening edge rather than in a small section thereof as in prior constructions, and the effective life of the sharpening device is increased accordingly.

The sharpening elements of the sharpener of the combination in accordance with the invention are resiliently urged towards each

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other so that they return to a rest position upon removal of the force tending to spread them apart. The sharpening elements may be plates or discs, and in the latter case they may be rotatable so as to enable infinite variation of the location at which sharpening occurs on each sharpening edge.

The basic construction of a blade scabbard may be as disclosed in Australian Patent 424 122, or Australian Patent 447 537.

The following description refers in more detail to the essential features and further optional features of the invention. To facilitate an understanding of the invention, reference is made to the accompanying drawings where these features are illustrated in preferred form. It is to be understood however, that the essential and optional features of the invention are not limited to the specific forms of these features as shown in the drawings.

In the drawings:

Figure 1 is a longitudinal cross sectional view of a scabbard and one particular embodiment of a blade sharpener, in accordance with the invention;

Figure 2 is a sectional view taken along lines II—II of Figure 1, shown on an enlarged scale;

Figure 3 is a view similar to Figure 2 but showing the sharpener engaged by a knife blade;

Figure 4 is a side elevational view of a variation of the sharpener shown in Figures 1—3;

Figure 5 is a front elevational view of the sharpener shown in Figure 4; and

Figure 6 shows a variation of the sharpener shown in Figure 2.

It is to be understood that Figure 1 is intended to show a typical application of the sharpener, and does not show the only form of scabbard with which the sharpener can be combined. Nevertheless, the particular scabbard shown has been found to have certain practical advantages as are fully explained in Australian Patent 447 537.

The scabbard shown in Figure 1 includes a housing 2 having a knife receiving passage 3 defined therein. An access opening 4 is provided at one end of the housing 2, and a blade sharpener 5 is supported by a carrier member 6 within the passage 3 so as to be located adjacent to the opening 4. The carrier member 6 is pivotally connected to the housing 2 at a position 7 remote from the access opening 4, and a spring 8 functions to bias the carrier member 6 towards an upper wall 9 of the housing 2. In the drawing, the carrier member 6 is shown pushed down into a lowered position against the action of the spring 8, as would occur if a knife blade was inserted into the passage 3 between the sharpener 5 and upper wall 9.

A reaction member 11 is pivotally mounted on the carrier member 6 at a position 12, and functions to form a guide for a knife blade and to also react with the upper wall 9 so as to assist in initial insertion of a knife blade into the passage 3. That is, part 13 of the member 11 is engaged by the upper edge of the knife blade and is thereby forced against the wall 9 so that a downwardly directed reaction force is transferred to the carrier member 6 through the pivot connection 12.

The sharpener 5 shown in Figure 1 is not the only possible embodiment of a sharpener of the combination of the invention, and furthermore that sharpener need not be pivotally mounted on the carrier member 6 as shown. It is possible to achieve the objects of the invention with a sharpener that is not movable relative to its support structure (e.g., the carrier member 6), or is arranged for linear relative movement rather than pivotal movement.

Referring now to Figure 2, the particular sharpener 5 shown comprises a support member formed of a base section 14 and two laterally spaced arms 15 which are interconnected at one end through the base section 14. The space 16 between the arms 15 defines a blade receiving slot, and a respective sharpening blade 17 is connected to each arm 15 so that the sharpening recess 18 formed between sharpening edges 19 of those blades, is aligned with the slot 16. The carrier member 6 may be formed of a plastics material, although that is not essential, and the sharpening blades 17 may be secured to that member by adhesive or any other appropriate means such as in situ moulding.

Resilience is preferably imparted to the lower section of each arm 15 by forming a groove 21 therein, but other methods could be employed to achieve the same effect. The basic requirement being that the arms 15 are adapted to be spread about a fulcrum zone remote from the sharpening recess 18, and that resilient means functions to bias those arms into a rest position. Figure 3 illustrates the arms 15 in a spread condition caused by pressure applied through a knife blade 22 engaged in the recess 18.

In particular construction shown in Figures 1—3, the base section 14 of the support member is pivotally connected to the carrier member 6 so that the sharpener 5 is capable of limited rocking movement relative to the member 6 about an axis extending substantially in the direction of relative movement between the elements 17. The degree of rocking movement is limited by engagement between a depending flange 23 formed integral with the base section 14, and spaced stops 24 and 25 secured to the carrier member 6. The flange

23 is preferably flexible so as to function as a shock absorber and to also return the sharpener 5 at least part way back into a neutral position when sharpening pressure is removed from the sharpener. Other limit stop arrangements may be employed, and as previously mentioned it is possible to achieve satisfactory results without pivotally mounting the sharpener 5.

A modification of the sharpener of Figures 1—3 is shown in Figures 4 and 5, and for convenience of identification parts of that embodiment corresponding to parts of the previous embodiment will be given like reference numerals, but in a higher series. For example, the entire device 105 corresponds to the sharpener 5 of Figures 1—3. According to the embodiment of Figures 4 and 5, the sharpening elements and their support member are formed as an integral unit from a single piece of metal. The sharpening elements are defined by crossed blades 117 which are interconnected at one end through a channel shaped base section 114. The sharpening edges 119 of the blades 117 define a recess 118 between them as best seen in Figure 5. Because of the natural resilience of the metal used to form the device 105, the blades 117 will tend to spread apart under the application of pressure by a knife blade located in the recess 118, and will return to the rest position when that pressure is removed. Such spreading will usually result from flexure or bending of each blade 117 at a zone adjacent the connection with the base section, and that zone can be regarded as the resilient means referred to in the appended claims and other definitions of the invention contained in this specification.

The device 105 is preferably pivotally mounted on its support structure, such as the carrier member 6 shown in Figure 1, by means of a pivot pin 126 extending through side flanges 127 of the base section 114. A depending flange 123 is preferably arranged to cooperate with stops corresponding to those identified as 24 and 25 in Figure 1.

Figure 6 illustrates a variation of the sharpener 5 as shown in Figures 1—3, wherein rotatable wheels or discs 517 are substituted for the elongated blades 17.

In each of the arrangements described, stop means may be provided to limit downward movement of a knife blade within the sharpening recess, and that means may comprise a shoulder formed at least on one of the sharpening elements at or adjacent the lower end portion of its sharpening edge. Alternatively, the stop means may be defined by a pad or block of material having a hardness such as not to damage the cutting edge of the knife blade — e.g., a substantially soft plastics material. That pad or block may serve the dual

purpose of a stop and a rubbing or cleaning pad or block.

Any one of the arrangements of sharpeners described can be applied to a knife scabbard of appropriate construction, such as those shown and described in Australian Patent No. 424,122, and Australian Patent No. 447,537. A sharpener of the blade sharpener and scabbard combination according to the invention has the advantage of permitting alteration of the zone of sharpening along the edges of the sharpening elements, and that alteration occurs automatically.

It will be appreciated from the foregoing description that a sharpener of the combination according to this invention may be supported or mounted so as to pivot or rock in response to engagement by a knife blade. The pivotal mounting may take any appropriate form, and may be as disclosed in the patents identified above. Such pivotal mounting enables the sharpener to have a sharpening effect in each of the two possible directions of movement of a knife blade relative to the sharpener. Alternative to such rocking movement, the sharpener may be slidable or it may be fixed against movement of any kind.

WHAT WE CLAIM IS:—

1. A blade sharpener and scabbard combination including; a housing having a blade receiving passage therein; an access opening at one end of said passage; and a sharpening device connected to said housing adjacent said access opening and having two sharpening elements each defining a respective sharpening edge, said elements being arranged in crossed relationship so that said sharpening edges extend angularly relative to each other and define a sharpening recess between them, mounting means comprising a pair of arms and an integral base section interconnecting said arms at one end, a respective one of said sharpening elements being formed by or attached to an end portion of each said arm remote from said base section, and at least one zone of each said arm adjacent said base section being resilient to permit said recess to be widened by separation of said elements and to urge said elements towards each other from such a separated position; said recess being in alignment with said passage so that said sharpening edges are engageable with respective opposite sides of a blade received, in use, within said passage.

2. A combination according to claim 1, wherein each said sharpening element forms an integral part of a respective one of said arms so that said elements and said mounting means are formed by a single member.



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10 A modification of the sharpener of Figures 1—3 is shown in Figures 4 and 5, and for convenience of identification parts of that embodiment corresponding to parts of the previous embodiment will be given like reference numerals, but in a higher series. For example, the entire device 105 corresponds to the sharpener 5 of Figures 1—3. According to the embodiment of Figures 4 and 5, the sharpening elements and their support member are formed as an integral unit from a single piece of metal. The sharpening elements are defined by crossed blades 117 which are inter-connected at one end through a channel shaped base section 114. The sharpening edges 119 of the blades 117 define a recess 118 between them as best seen in Figure 5. Because of the natural resilience of the metal used to form the device 105, the blades 117 will tend to spread apart under the application of pressure by a knife blade located in the recess 118, and will return to the rest position when that pressure is removed. Such spreading will usually result from flexure or bending of each blade 117 at a zone adjacent the connection with the base section, and that zone can be regarded as the resilient means referred to in the appended claims and other definitions of the invention contained in this specification.

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50 Figure 6 illustrates a variation of the sharpener 5 as shown in Figures 1—3, wherein rotatable wheels or discs 517 are substituted for the elongated blades 17.

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2. A combination according to claim 1, wherein each said sharpening element forms an integral part of a respective one of said arms so that said elements and said mounting means are formed by a single member.

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5 3. A combination according to claim 1,
wherein said mounting means is moulded
from a plastics material so that said arms
thereof are laterally spaced apart over their
entire length, and each said sharpening
element is attached to a respective said arm.

10 4. A combination according to any
preceding claim, wherein said mounting
means is pivotally connected, at or adjacent
said base section thereof, to a support
structure so that said elements are capable of
limited rocking movement about an axis
which extends generally in the direction of
said relative movement between the
15 elements.

5. A blade sharpener and scabbard
combination substantially as hereinbefore
described with reference to Figures 1 to 3, 4
and 5, and Figures 1 to 3 as modified by
Figure 6 of the accompanying drawings. 20

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