May 17, 1927. 1,628,754

C. A. STRAND

BLADE SHARPENING MECHANISM

Filed March 14, 1921

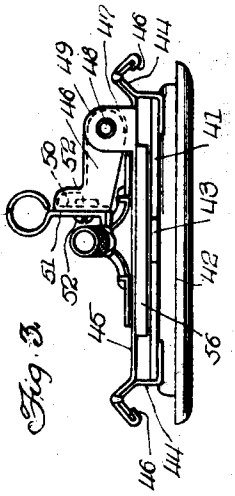


Fig. 3.

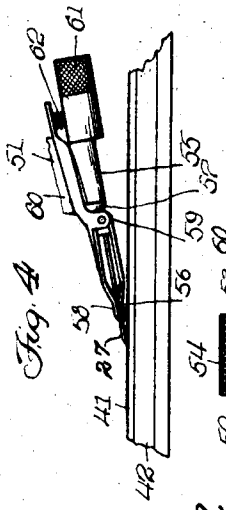


Fig. 4

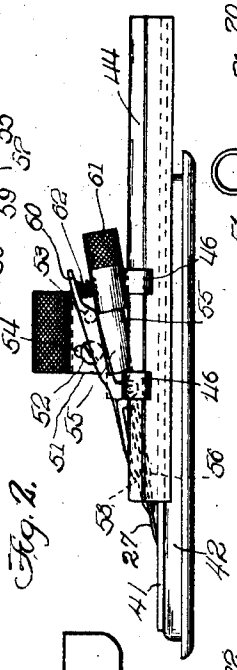


Fig. 2.

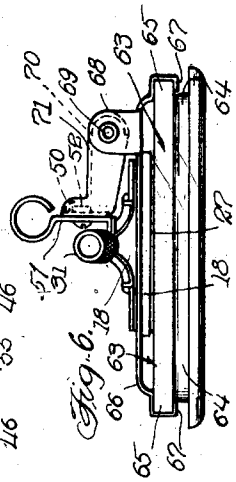


Fig. 6.

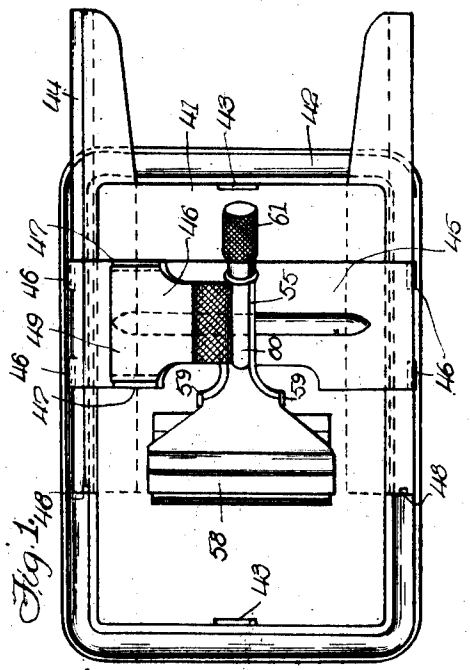


Fig. 1.

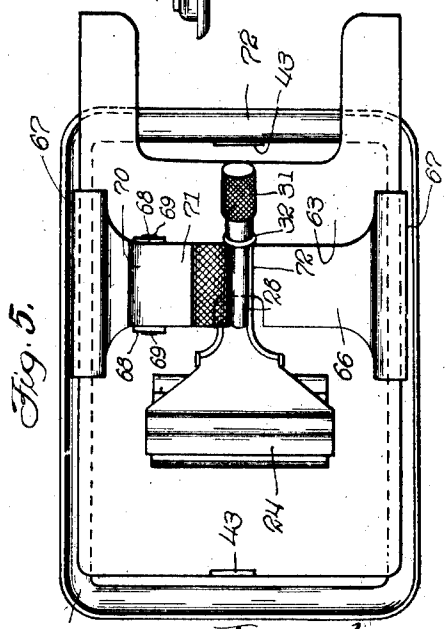


Fig. 5.

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UNITED STATES PATENT OFFICE.

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BLADE-SHARPENING MECHANISM.

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This invention relates to that class of blade-sharpening mechanisms having a blade-engaging hone member, and blade-supporting and guiding means adapted to support and guide a blade in frictional engagement with the surface of the said hone member and in the desired inclined position with respect to the blade-engaging surface of the hone, and with respect to the direction of the path of movement of the blade.

The principal object of this invention is to provide a simple, economical and efficient blade-sharpening mechanism adapted to enable safety razor blades, or similar blades, to be supported and guided in frictional engagement with the surface of the hone or main blade-edge-engaging hone member, and to enable the blade to be inverted, and inserted in the desired inclined position, and removed and replaced with facility and in an efficient manner, and all in such a manner as to enable blades to be sharpened by either skilled or unskilled operators with facility and by simple and efficient means.

Other and further objects of the invention will appear from the following description and claims, and from an inspection of the accompanying drawings which are made a part of this specification.

The invention consists in the features, combinations, arrangement of parts, and details of construction herein described and claimed.

In the accompanying drawings,

Figure 1 is a plan view of a blade-sharpening device made in accordance with my invention, and having a flat main blade-edge engaging hone member or plate provided with guiding tracks on opposite sides thereof, and blade-supporting carriage and clamping mechanism including a pair of invertible blade-clamping jaws located between the tracks and movable back and forth longitudinally of the tracks and hone;

Fig. 2 is a view in side elevation of the device shown in Fig. 1, looking in the direction indicated by the arrows;

Fig. 3 is a view in end elevation of the mechanism shown in Fig. 1, looking from the right of said figure;

Fig. 4 is a detail view of the adjustable sleeve and blade-supporting means shown in Figs. 1, 2 and 3;

Fig. 5 is a plan view of a modified form of my improved blade-sharpening mechanism showing the blade-supporting reciprocating carriage mounted directly on the main hone member or blade-edge-engaging and sharpening hone plate; and

Fig. 6 is a view in end elevation of the mechanism shown in Fig. 5, looking from the right side of said figure.

In the form of improved blade-sharpening device shown in Figs. 1 to 4 inclusive the main hone member or blade-engaging and sharpening hone plate 41 consists of a flat plate of metal, such as cold rolled steel—although it is obvious that in view of the disclosure and description above set forth the plate 41 may be bent or curved so as to have the slightly curved upper surface already described in connection with the hone plate 1; and the flat plate 41 with its flat top blade-edge-engaging and sharpening surface may be mounted on the base 2 in the place of the plate 1, if desired.

The stamped flat plate 41 of cold rolled steel or other suitable metal for frictionally engaging and sharpening the edge of a razor blade or similar edged tool is mounted on a sheet metal base 42 and secured in place by means of bent lugs 43 which may be integral with the base and bent over the adjacent margins of the hone plate 41. Parallel guiding tracks 44, 44 are provided on opposite side margins of the hone plate 41 and base 42, and may be fixed to or integral with either said hone plate or base plate, or attached in fixed relation to the same. (See Figs. 1 and 3.) Slidably and reciprocatingly mounted on the tracks 44, 44, is a transverse carriage 45, which may be formed of sheet metal bent or stamped to shape, and extends transversely across and above the top surface of the hone plate 41 with the opposite side extremities of the carriage in sliding engagement with the said tracks. Bottom flanges or lugs 46, 46 on the opposite edges of the carriage are adapted to extend over and beneath the corresponding side margins of the tracks 44, to hold the carriage in operative position and in sliding engagement with the tracks; and end lugs 48, 48 on the ends of the tracks, serve to limit the movement of the carriage endwise of the tracks, and to prevent the carriage from being accidentally displaced.

Pivotally mounted or in hinged engagement with the carriage 45 is a blade-supporting arm 46 which may be substantially identical in construction with the arm or bracket 9 already described; said arm 46

being pivotally connected with the carriage by means of perforated lugs or uprights 47, 47 which may be integral with the carriage 45 and bent upward from the side margins thereof, a pivot pin or axle 48 being mounted in the perforations in the upper extremities of said lugs and extending through a sleeve or socket 49 formed on the arm 46 and extending parallel to the tracks and in parallel relation to the direction of movement of the reciprocating blade-supporting and guiding carriage on which the pivoted arm 46 is pivotally supported or hinged.

The pivoted arm 46 has an upright flange portion 50, to which is adjustably secured a clamp-supporting member 51, which is adjustably connected with the flange 50 of the arm 46 by means of a screw 52, or other suitable securing means. A pin 53 extending through the flange 50 and adjustable clamp-supporting member 51 is adapted to secure said parts in adjustable relation, and the screw 52 serves to hold the slotted adjustable member 51 having a segmental slot 54 therein, in place. The adjustable clamp-supporting member 51 has an integral inclined sleeve 55 formed on its lower margin, said sleeve extending upward and rearward at an incline in oblique relation to the top surface of the hone plate member 41, and in a vertical plane which is parallel with respect to the direction of the path of movement of the blade and blade-supporting and guiding mechanism, and in parallel relation to and between the parallel tracks 44, 44.

Blade clamping mechanism identical with that already described may be mounted in the sleeve 55. However, I have shown in Figs 1 to 4 inclusive a pair of blade-clamping jaws comprising a lower clamping jaw 56 having a fixed stem 57 extending upward and rearward at an incline and journaled in the sleeve 55, so as to form an axle adapted to permit the clamping jaws, and a blade clamped between the jaws, to be inverted by raising the arm 46 on its pivot 48. Said lower clamping jaw and stem may be identical in construction with the lower jaw 18 already described, and the stem 20. And an upper clamping jaw 58 which may be identical with the upper jaw 24, with its lever arm 28, is hinged to the lower jaw 56 by means of side hinges 59, in the same manner in which the jaws 18 and 24 are connected. The upper clamping jaw 58 has a rearwardly projecting lever arm 60 fixed thereto and extending outside of and entirely across the sleeve 55; and a sleeve or cap 61 is mounted on the end of the stem 57, and provided with a compressible spring 62 mounted between the upper end of the lever arm 60, and the stem or sleeve, and adapted to yieldingly hold the rear or engaged end of the lever 60 in raised position, and thereby hold the clamping jaws in clamping engagement with the safety razor blade clamped therebetween. The clamping jaw 58 may be raised out of clamping engagement with the blade by pressing down on the lever arm 60 and compressing the spring 62. It should be noted that the clamping jaws 56 and 58, as well as the clamping jaws 18 and 24 are supported upon inclined axles which are each in a vertical plane parallel to the tracks, and also parallel to the direction of movement of the jaws and blade to be sharpened, the direction of movement of the blade, in each instance, being at right angles to the edge of the blade. In other words, the edge of the blade is at right angles to the direction of movement of the blade, and the body of the blade is inclined; and the axle of each pair of clamping jaws is rotatable in a vertical plane which is parallel to the direction of movement of the blade and jaws, to permit the jaws and blade to be inverted so as to present first one side and then the other of the edge of the blade in position to be sharpened against the surface of the main hone member or hone plate. The hone plate engages the edge of the blade so as to cooperate with the guiding track and blade-supporting reciprocating mechanism in holding the blade at the proper angle of inclination with respect to the surface of the hone during the operation of sharpening the blade; and the curvature of the hone longitudinally serves to enable the edge of the blade to be somewhat hollow ground, and made very sharp, without the necessity of employing a skilled operator.

The degree of curvature or concavity of the upper face of the hone member 1 is, of course very slight, the depth of the deepest part of the depression or curvature being, by preference, less than one hundredth part of an inch, and gradually merging into the substantially flat surface of that portion of the plate which is flat or substantially flat transversely of the plate or hone.

In the form of device embodying my invention, as shown in Figs. 5 and 6, a main hone member or blade-edge-engaging and sharpening metallic hone plate 63, formed of a plate of flat cold rolled steel or other suitable metal stamped to form a main hone member of the desired dimensions, is mounted on a suitable base 64 of stamped sheet metal, in such position that the opposite side edges 65, 65 of said hone plate 63 are supported in position to enable a transverse carriage 66 to be slidably mounted on the hone member 63, with the opposite flanged side margins or edges 67 folded over and beneath the corresponding edge of the plate 63, and in sliding engagement with the same.

The carriage may be made of sheet metal stamped and bent in the form shown in the drawings, or in suitable form to reciprocate or slide back and forth over the main hone

member 63. And lugs 68—68 integral with the sheet metal body of the carriage form a support for a pivot pin or axle 69 mounted therein and extending parallel to the top of the main hone member and parallel to the direction of the path of movement of the carriage, and on which the sleeve or socket portion 70 of the blade-supporting pivoted arm 71 is pivotally mounted. On the arm 71 is an inclined sleeve 72 which may be of identical construction with the adjustable sleeve member 12, and sleeve 13 already described. And blade clamping jaw mechanism of identical construction with the jaws 18 and 24, and the stem and means for opening and closing and inverting said jaws, may be and is mounted in the sleeve 72. The jaws 18 and 24, and lever 28 and stem 20 thus supported by the sleeve 72 on the pivoted arm 71, may be operated by the eccentric 32 on the cam sleeve 31 in the manner already described in connection with Figures 1 to 6 inclusive of the drawings.

Although I prefer to employ a metallic main hone member such as the hone members 1, 41 or 63, the hone member or hone proper against which the blades are to be sharpened may be of suitable stone, slate, or composition or any suitable material for sharpening a blade requiring a sharpe edge such as a safety razor blade.

The metallic hone plate 1 is, by preference, of uniform thickness throughout, and made by stamping a flat plate or sheet of cold rolled steel or similar metallic sheet, in an ordinary die press thus very slightly bending the plate as described, although the top surface of the plate may be shaped or ground so as to have the desired slight curvature, or desired shape, and may be perfectly flat if desired, though I prefer that it should be very slightly bent as above described.

I claim:

1. In a blade-sharpening device of the class described, the combination of a hone, a reciprocating carriage operatively connected with and movable longitudinally of said hone, a clamp-supporting arm pivotally connected with and supported on said carriage and adapted to swing in a plane transverse to the path of movement of the carriage, a pair of inclined invertible blade-clamping jaws having their lower blade-engaging margins transverse to the hone and in transverse relation to the path of movement of said carriage, and provided with an inclined axle in supporting engagement with said clamping jaws and rockingly mounted in normally inclined position in said pivoted clamp-supporting arm, and means for securing said clamping jaws in clamping engagement with a blade to be sharpened.

2. In a blade-sharpening device of the class described, the combination of a hone member, a reciprocating blade-supporting carriage extending transversely across and having its opposite sides supported in movable relation to and on opposite sides of said hone member, a hinged clamp-supporting arm mounted on the carriage, and a pair of inclined blade-clamping jaws invertibly supported upon said hinged clamp-supporting arm and adapted to invertibly support a blade in inclined position in frictional engagement with the surface of the hone member.

Signed at Chicago, in the county of Cook and State of Illinois, this 5th day of March, 1921.

CHARLES A. STRAND.