July 4, 1933. B. L. BENSON 1,916,600

BLADE SHARPENER

Filed May 6, 1931

Fig. 1.

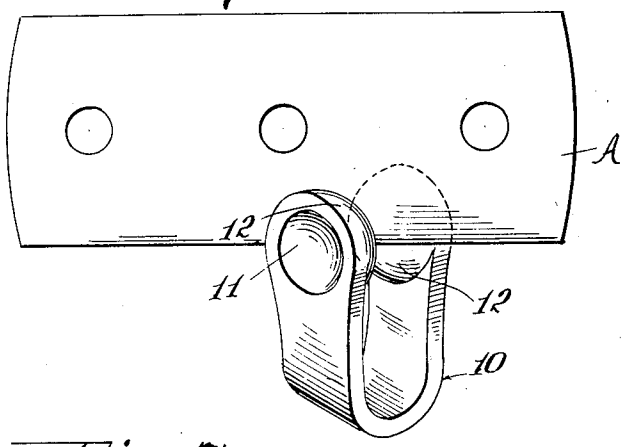


Fig. 2.

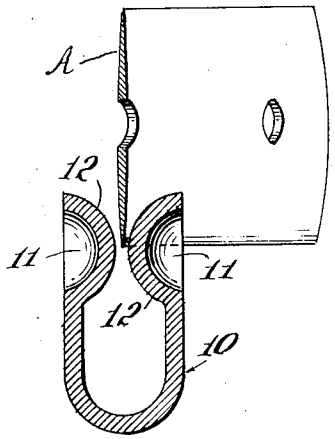


Fig. 3.

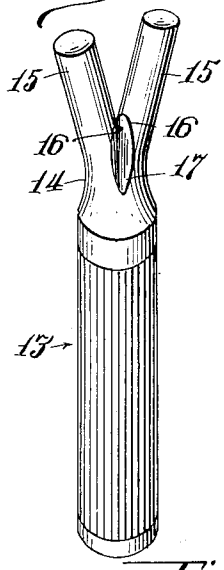


Fig. 4.

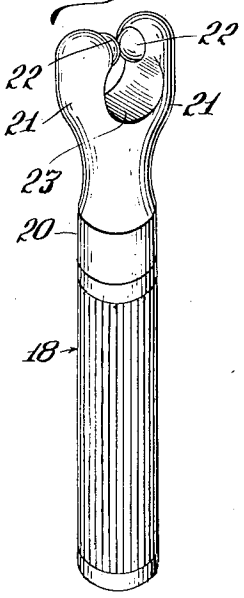


Fig. 5.

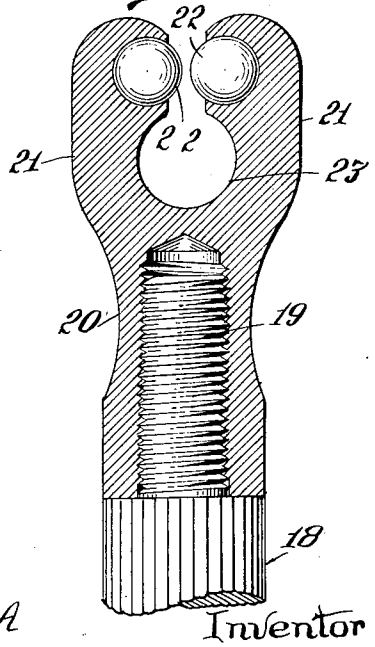


Fig. 6.

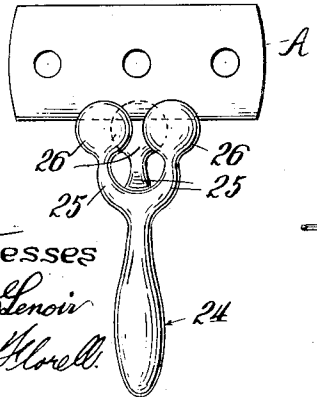
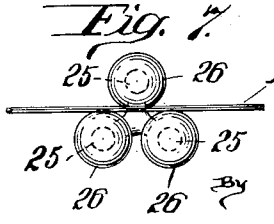


Fig. 7.



Witnesses

Milton Lenoir

J. A. Glorell

Inventor

Burt L. Benson

By George Heidmann

Attorney.

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UNITED STATES PATENT OFFICE

BURT L. BENSON, OF WHEATON, ILLINOIS

BLADE SHARPENER

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My invention relates to means for sharpening blades or sharp-edge tools, namely means wherein contact with the immediate edge of the blade is prevented, while on the other hand a smooth rubbing contact with the sides of the blade immediately adjacent the cutting edge is provided.

My invention has for its object the provision of sharpening means provided with smooth, uniform, curved surfaces adapted to smooth down or burnish the fibre or molecules of the metal blade and to at the same time re-align any minutely displaced portions of the cutting edge so as to restore the same substantially to the original relation.

I am aware that blade sharpening devices have been produced comprising a pair of opposing metal portions arranged in contacting relations and adapted to be drawn or have the blade drawn lengthwise therebetween.

Such devices, however, have been so constructed that the immediate edge of the blade would come into contact with the metal portions or surfaces with the result that the cutting edge was dulled or ruined. There are also devices wherein the adjacently placed portions of the devices were provided with angular or sharp edges which were intended to abrade the blade, thereby wearing away the tapered edge of the blade, while at the same time permitting the immediate or cutting edge of the blade to contact therewith.

Such devices, however, are very objectional because they result in an abrasion and wearing away of the blade, without producing the desired sharpening effect.

Also, I am aware that there have been devices constructed involving movable portions or rotating surfaces whose function is merely to roll down or press into alignment the minute displaced portions of the blade edge, but such devices do not burnish the immediate blade-edge while at the same time re-aligning the molecules of the blade-edge.

My improved means are devised to overcome these serious objections and to accomplish a better sharpening of blades and particularly the rather delicate or thin safety razor blades at present in use.

The objects and advantages of my invention will be readily comprehended from the following description of the accompanying drawing, wherein:

Figure 1 is a perspective view of one form of my invention with a safety razor blade shown in full lines.

Figure 2 is a longitudinal sectional view of the device shown in Figure 1.

Figure 3 is a perspective view of a modified form.

Figure 4 is a perspective view of another modification of the invention.

Figure 5 is a sectional view of the upper end of the form shown in Figure 4.

Figure 6 is a perspective view of another modified form of the invention.

Figure 7 is a top plan view thereof.

My invention, in its various forms, involves a burnishing principle, by the provision of opposingly disposed smooth arcuate surfaces whereby the sides of the cutting edge of a blade will be burnished and smoothed out, while contact with the immediate cutting edge is prevented, and at the same time a re-aligning of the minute displaced portions of the edge is effected.

Blade sharpening devices, heretofore employed, contemplate the sharpening of a blade by abrasion, wearing away or removing portions of the blade in an attempt to provide a practically new cutting edge. Such devices, as is apparent, are very objectionable and impracticable, particularly so with the extremely thin metal sheet or safety razor type of blade.

In the exemplification of my invention as disclosed in Figures 1 and 2, the sharpener comprises a somewhat U-shape rigid body portion 10, incapable of being flexed by pressure normally encountered in the sharpening operation.

The form of the device shown in Figures 1 and 2 is a very simple embodiment which may be readily carried in a pocket, and in order that it may be easily held between the thumb and forefinger of the user, the body portion 10 is shown of comparative width, with the ends dished or cupped on the outer sides to provide the finger receiving sockets 11, 11.

In providing the finger sockets, the ends of the body portion are dished or concaved inwardly toward each other to provide the substantially semi-spherical portions 12, 12, preferably formed with uniform and smooth opposing surfaces.

The semi-spherical surfaces 12 are formed and arranged in slight spaced relation at the opposing apices of the arcuate surfaces so as to permit the immediate cutting edge of a blade, as shown at A, to fit therebetween. These arcuate surfaces 12 are, however, so closely arranged as not to permit the body of the blade just beyond the immediate edge to pass therebetween.

The arcuate or semi-spherical portions 12, 12 are formed of a suitable hard steel or other suitable material and provided with smooth polished surfaces throughout so as not to become easily marred or roughened through improper handling. As shown in the drawing, the blade is preferably held at a slight angle or in a plane tangentially to the opposing apices of the arcuate surface and then drawn lengthwise, or the device drawn lengthwise of the blade. As can be seen in Figure 2, the immediate cutting edge is disposed between the arcuate surfaces 12, 12 without contacting therewith, while the sides of the blade at the cutting edge are in contact with both arcuate surfaces. It is apparent that relative movement between the blade and the device, in directions lengthwise of the blade, will cause a realignment of the minute metal portions and compression of the molecules of the blade edge, and hence properly burnish the opposite sides immediately adjacent to the cutting edge.

The repeated movement of the device, lengthwise of the blade (or by moving the blade back and forth intermediate of the arcuate surfaces), causes the side surfaces of the cutting edge to be polished and the molecules of the cutting edge to be closely compressed into a fine, true and smooth edge which, due to the burnishing operation, provides a hardened and polished cutting edge, without the objectionable action of removing the metal as, however, is the case with devices as heretofore constructed.

In Figure 3, I show a modification of my invention involving a hand grasping portion or shank 13 provided at the upper end with the somewhat V-shaped blade sharpening portion 14 consisting of the cylindrical bifurcations 15, 15. Although these bifurcations are shown cylindrical, it is merely essential that the opposing sides adjacent the crotch portion, namely at the points indicated at 16, be uniformly curved or made arcuate to engage the opposite sides adjacent to the cutting edge of the blade. The crotch portion is socketed, namely with the portions receding from each other, as at 17 in order to provide a space to receive the immediate edge of the blade. These surfaces 16, 16, like the surfaces 12, 12, are spaced apart just sufficient to receive the edge of the blade therebetween without, however, permitting the blade proper to slip or pass entirely down into the socket 17.

Like in the form shown in Figure 1, the blade to be sharpened is preferably held slightly at an angle to the vertical or longitudinal axis of the device so that both surfaces of the blade at the cutting edge will bear against the arcuate surfaces 16, 16, and cause a burnishing of the side surfaces of the cutting edge. The burnishing portion 14 of the device is, of course, made from a suitable hard metal or material having smooth polished surfaces.

In Figures 4 and 5 I disclose another modification of the invention involving a handle portion 18 provided with a threaded shank 19 adapted to screw into a threaded socket in the burnishing or blade sharpening head-portion 20. The portion 20 at its upper end is provided with the bifurcations or spaced legs 21, 21, arranged to extend substantially parallel with each other; and the opposing faces adjacent the upper ends are each socketed to receive a hard, polished spherical member or ball 22, preferably immovably mounted in the socket. These spherical members 22 may be of suitable glass or hardened polished steel; and are arranged to provide a small space therebetween as more clearly shown in Figure 5, to receive the cutting edge of the blade therebetween. The spacing between the spherical members is preferably such that the main body of the blade will not pass downwardly therebetween; but even if the blade should happen to be of a thinness less than the spacing, contact with the cutting edge cannot be effected because of the enlarged spacing or socket between the base of the bifurcations as shown at 23.

If desired, the type of sharpener shown in Figure 3 may have the upper or head portion 14 socketed and removably secured to the handle 13 like the construction shown in Figures 4 and 5.

The handle 18, it will be seen, is similar to the removable handle employed in certain types of safety razors now in use and hence the razor handle may be used and the sharpening heads 14, or 20, screwed thereon, thus enabling the sharpening device to be of comparatively small dimensions enabling it to be readily carried in the shaving kit if desired.

In using the construction shown in Figures 3, 4 and 5, the blade, like in the previously described construction, is preferably held at a slight angle to the vertical axes of the devices so as to ensure a firm bearing of the side faces of the cutting edge against the

arcuate burnishing portions of the devices, without having the immediate cutting edge contact therewith.

By drawing the blade across the burnishing faces a few times (or conversely, by moving the device back and forth along the side faces of the cutting edge) a realigning of the molecules will be accomplished and a better sharpening effected.

In Figures 6 and 7 I illustrate another form of the invention wherein the device involves a handle 24 having a number of prongs (preferably three in number) 25 arranged in the triangular manner shown and of uniform spacing, and the upper ends of each prong 25 provided with a spherical member 26.

These spherical members 26 may be made integral with the prongs or removably secured thereto so as to be held firmly against rotation during the sharpening operation; and these members 26 may either be of hard polished metal, glass, stone, or other suitable material formed with smooth, uniform surfaces. The arrangement of the prongs 25 and the size of the spherical members 26—which are of equal size or diameter—are such that small spaces between the opposing sides of the spherical members are provided to receive the cutting edge of the blade; the spacings, however, being such as to prevent the blade from passing down entirely between the spherical members. As is apparent, the cutting edge of a blade will be disposed slightly beneath the apices of the opposing arcuate surfaces; while on the other hand the apices of these surfaces will come in contact with the side faces of the blade immediately adjacent to the cutting edge and as a result burnish and smooth down the side faces of the cutting edge.

With the construction shown in Figures 6 and 7, the blade may be drawn through the fine or narrow passage between the three members 26, thus having two spherical members 26 disposed on one side of the blade and the third member disposed on the opposite side of the blade; the blade being drawn in a straight line between the spherical members. On the other hand, the blade may be drawn between any two of the spherical members by tilting the device into horizontal position and then drawing the blade in a general direction lengthwise of the device, and at a slight angle to the longitudinal axis of the device in the manner stated in connection with the forms heretofore described.

This latter method is possible without contacting with the immediate cutting edge of the blade because the supporting prongs 25 are arranged to leave sufficient space between the respective prongs as shown in Figure 7.

I am aware that sharpening devices have been proposed depending upon abrasion or wearing away of the material, as well as a type having curved intersecting elements whereby contact with the immediate cutting edge of a blade is obtained, and therefore devices which will destroy the fine edges of safety razor blades or other thin and keen edged tools; but none of these devices are adapted to the principle of sharpening through the burnishing of the side faces of the immediate cutting edge as involved in the different embodiments of my invention shown and described.

What I claim is:

A sharpening device comprising a holding portion and a blade-edge receiving portion composed of uniform elements of hard material provided with opposing arcuate surfaces of similar convexity with the horizontal radii of the elements arranged in the same plane in close spaced relation to constitute the blade-edge receiving space therebetween so that said surfaces will contact with the side faces of the blade cutting edge, said surfaces being immovable and receding from each other immediately beneath the blade-edge side face contacting surfaces.

BURT L. BENSON.