My invention relates to a combined razor and sharpening device. My invention has particular reference to a combined razor and sharpening device embodying novel means for holding the razor blade either in shaving or sharpening position. My invention relates more particularly to a combined razor and sharpening device wherein the razor blade is of the single-edge type, means being provided for causing either side edge of the razor blade to engage a sharpening device or to be located in shaving position as will. My invention has further reference to a novel arrangement for varying the inclination of a razor blade when in shaving position. Still further, my invention relates to a novel and advantageous arrangement for mounting the sharpening roller forming part of a device of the character stated. Various other objects, advantages and features of my invention will become apparent from the following detailed description.

My invention resides in the combined razor and sharpening device, features and combinations of the character hereinafter described and claimed.

For an understanding of my invention and for an illustration of one of the forms thereof, reference is to be had to the accompanying drawings, in which:

Figure 1 is a rear elevational view, partly in section, showing the razor arrangement of my invention;

Figure 2 is a side elevational view of the razor arrangement shown in Fig. 1;

Figure 3 is a plan view of the razor arrangement shown in Figs. 1 and 2;

Figure 4 is a vertical sectional view, partly in elevation, taken on the line 4—4 of Fig. 1 looking in the direction of the arrows and with the razor blade occupying a different position; and

Figure 5 is an enlarged vertical sectional view, partly in elevation, taken on the line 5—5 of Fig. 2 looking in the direction of the arrows.

Referring to Figs. 1 and 2, 1 represents a tubular member carrying a cylindrical member 2 which comprises a circular gripping section 3 having an exterior knurled surface. A horizontal member 4, Fig. 4, is formed either integrally with or fixed to the tubular member 1 so as to extend in opposite directions therefrom. The member 4 has secured to the ends thereof the respective plates 5, 5 which are disposed in parallel relation. Between the plates 5 and 5, the member 4 supports a pair of spaced plate members 6, 6 disposed in parallel relation to thereby form a transverse channel utilizable as hereinafter described.

Extending freely through the tubular member 1 is a rod 7 to which is secured a handle sleeve 8 freely slidable on the exterior surface of said tubular member 1, the outer surface of the handle 8 preferably being knurled as shown. A spring 9 coiled around the rod 7 applies opposite forces to the tubular member 1 and handle sleeve 8 tending to separate them. The upper end of the rod 7 carries a U-shaped yoke 10 which, normally, is positioned in the channel formed by the plate members 5, 5. The outer ends 10a of the yoke arms carry a fixed axle pin 11 which is disposed at right angles to the rod 7, the pin 11 pivotally supporting the razor blade 12 which is mounted between the plates 5, 5 and which is suitably recessed as at 12a for the reception of the ends 10a of the respective yoke arms.

The blade 12, when in shaving position, has its shaving edge disposed adjacent a guard 13 fixed between the plates 5 and 5, the guard 13 being provided with teeth 13a which face the razor blade edge. Mounted for oscillatory movement in the plate 5, 5 is a transverse member 14 provided with cam sections 14a coactable with the lower surface of the blade 12 adjacent the cutting edge thereof, Fig. 4. As shown in Figs. 2 and 3, the aforesaid transverse member 14 extends through one of the plates 5 and the projecting end thereof carries an actuating lever 15 which, at its free end, coacts with an arcuate member 16, the outer surface of which is disposed outwardly of the outer surface of the adjacent plate 5 to slight extent. At the respective opposite ends of the arcuate member 16, pins 17 are disposed to limit movement of the lever 15.

With an arrangement of the character described, it will be understood that the lever 15 may be moved as desired to thereby raise or lower the cam sections 14a of the transverse member 14 whereby the cutting edge of the blade 12 is caused to take a desired cutting position. The free end of the lever 15 coacts frictionally with the arcuate member 16 to thereby retain the transverse member 14 and its cam sections 14a in the desired adjusted position.

In accordance with the invention, each of the plates 5, 5 carries a tubular housing 18 and these housings 18 are disposed in transverse alinement with each other. The outside wall surface of each of the housings 18 is provided with an elongated slot 18a, the slots 18a being disposed in
transverse alinement with each other and with similar elongated slots 5a formed in the respective plates 5, 5. Each set of the slots 5a and 18a receives a pintle 18a of a blade sharpening roller 19. As shown in Fig. 5, each pintle 18a is engaged by a member 20 biased in an upward direction by a spring 21, the member 20 and spring 21 being confined within the associated housing 19.

As indicated in Fig. 2, the slots 5a and 18a are elongated in a direction extending substantially at right angles to the plane of the blade 12 when the latter is in sharpening position. Therefore, as described more fully below, the roller 19 is free to automatically take a more effective sharpening position than would be the case were the roller 19 rotatable on a fixed longitudinal axis.

As illustrated on the drawing, one of the plates 5 carries a pair of inwardly extending pins 22, 22a while the other plate 5 carries another pair of inwardly extending pins 23, 23a. The arrangement is such that the pins 22 and 23 on the one hand, and the pins 22a and 23a on the other hand are transversely aligned in pairs, these respective pairs of pins being disposed in substantially symmetrical relation on opposite sides of the axle pin 11 when the latter is positioned as shown in Fig. 4.

The razor blade 12, on each side thereof, is provided with a recess 12b, these recesses being transversely aligned and so arranged that, when said razor blade 12 is in engagement with the sharpening roller 19, the pins 22a, 23a are received within the respective recesses 12b and the rear surface of the razor blade 12 is in engagement with the pins 22, 23. In Fig. 4, the razor blade 12 is shown as disposed in its sharpening position. When thus disposed, the spring 9 draws the yoke 10 downwardly toward the member 4 which forms the bottom of the channel defined by the plate members 6 and 6, this channel determining the position of the yoke 10 when the razor blade 12 is in cutting position, the pins 22, 23 are received within the respective recesses 12b and the rear surface of said razor blade 12 is in engagement with the pins 22a, 23a.

In Fig. 4, the razor blade 12 is shown as disposed in its sharpening position. When thus disposed, the spring 9 draws the yoke 10 downwardly toward the member 4 which forms the bottom of the channel defined by the plate members 6 and 6, this channel determining the position of the yoke 10 when the razor blade 12 is in either shaving or sharpening position. However, the spring 9 is prevented from seating the yoke 10 on the member 4 by reason of the motion-limiting effect on the razor blade 12 produced, first, by the pins 22a and 23a which are engaged by the rear surface of the razor blade 12 and, second, by the cam sections 14a of the transverse member 14 which are engaged by the front surface of the razor blade 12.

As will readily be understood from a consideration of Fig. 4, the spring 9, acting through the yoke 10, draws the rear surface of the razor blade 12 into engagement with the pins 22a, 23a whereby a biasing effect is applied to said razor blade 12 tending to rotate the same in a clockwise direction, Fig. 4, whereby the outer edge thereof is positively held in shaving position, i.e., in engagement with the cam sections 14a which serve as a means for positioning the edge of the razor blade in shaving position. At this time, the pins 22, 23 are positioned within the respective recesses 12b of the razor blade 12 in a non-functional manner.

When it becomes desirable to change the shaving position of the razor blade 12, the lever 15 may be moved in one direction or the other to thereby move the transverse member 14 about its longitudinal axis with resultant change in position of the cam sections 14a and change in inclination of the razor blade 12.

When the razor blade 12 is disposed in its shaving position, the yoke 10 is elevated, against the action of the spring 9, by effecting relative movement toward each other of the circular gripping section 3 and the handle sleeve 8. After the yoke 10 has been elevated above the plate members 6 and 6, the handle sleeve 8 may be rotated and with respect to the tubular member 1 through an angle of 180 degrees while holding the circular gripping section 3 stationary. Thereupon, pressure upon the handle sleeve 8 may be released to permit downward movement of the yoke 10 so that the latter descends between the plate members 6 and 6 and the cutting edge of the razor blade 12 comes into engagement with the sharpening roller 19 which may be actuated in suitable manner to thereby effect the desired sharpening action.

When the razor blade 12 is thus disposed in sharpening position, Figs. 1, 2 and 3, the spring 9 draws the yoke 10 downwardly toward the member 4. However, the spring 9 is prevented from seating the yoke 10 on the member 4 by reason of the motion-limiting effect on the razor blade 12 produced, first, by the pins 22 and 23 which are engaged by the rear surface of the razor blade 12 and, second, by the surface of the sharpening roller 19.

In generally the same manner as previously described, the spring 9, acting through the yoke 10, draws the rear surface of the razor blade 12 into engagement with the pins 22, 23 whereby a biasing effect is applied to said razor blade 12 tending to rotate the same in a clockwise direction, Fig. 4, whereby the cutting edge thereof is positively held in sharpening position, i.e., in engagement with the sharpening roller 19. At this time, the pins 22a, 23a are positioned within the respective recesses 12b of the razor blade 12 in a non-functional manner.

The construction comprising the elongated slots 5a and 18a together with the biasing arrangements for the pintles 18a permits the sharpening roller 19 to take the position which the razor blade 12 tends to impose thereon when the latter is held in sharpening position under the influence of the spring 9. Thus, by reference to Fig. 5 and assuming that the pintles 18a have been moved upwardly to the ends of the respective slots provided therefor, the line L may be taken as designating the longitudinal axis of the sharpening roller 19 and its pintles 18a. If the sharpening roller 19 should be so mounted that this longitudinal axis is incapable of adjustment it would be necessary for the longitudinal axis of the axle pin 11, the extreme end of the cutting edge of the razor blade 12 and said longitudinal axis L to be disposed exactly in parallel relation if said cutting edge last named is to effectively engage the sharpening roller 19 throughout the length thereof. This parallel relation is difficult to obtain in ordinary manufacturing operations.

As indicated in Fig. 5, it may be assumed that the longitudinal axis of the axle pin 11 or the extreme cutting edge of the razor blade 12 is parallel to a line L instead of the line L. Under these circumstances, if the longitudinal axis of the sharpening roller 19 and its pintles 18a were fixed, there would be a gap between the end of the razor cutting edge at the right, Fig. 5, and the roller 19, and this gap would extend from
right to left, Fig. 5, throughout almost the entire length of the razor blade 12. However, since the longitudinal axis of the sharpening roller 19 and its pintles 19a is adjustable as described, the line L does not remain in the position shown but it does take a position wherein it coincides with the line L1. As a result, the razor cutting edge engages said sharpening roller 19 throughout its entire length and, therefore, the sharpening operation may be efficiently and properly performed.

As stated above, when it becomes desirable to sharpen the razor blade 12, the yoke 10 is elevated above the plate members 5, 6 and the handle sleeve 8 is rotated through an angle of 180 degrees while holding the circular gripping section 3 stationary. Obviously, an operation of that described is performed when it becomes desirable to move the razor blade 12 from the sharpening position to the shaving position.

A feature of the invention resides in the fact that the described mechanism is adapted for readily sharpening both sides of the blade 12. Thus, after one side of said blade 12 has been sharpened as described above, the yoke 10 may be elevated and the blade 12 rotated on its axe pin 11 through an angle of more than 180 degrees to bring the sharpened blade surface uppermost. Thereupon, the yoke 10 is rotated through an angle of 180 degrees and reseated in the channel defined by the plate members 5, 6. This brings the non-sharpened surface of the blade 12 into engagement with the sharpening roller 19.

If desired, the plate members 5, 6 may be provided, respectively, with the slined notches 6a. If so, the yoke 10 may be elevated, then rotated through an angle of 90 degrees and then seated in the notches 6a where it is held by action of the spring 3. The blade 12 may then be rotated on its axe pin 11 through an angle of more than 180 degrees to bring the sharpened blade surface uppermost. Thereupon, the yoke 10 may be elevated from the notches 6a, moved further through another angle of 90 degrees and reseated in the channel defined by said plate members 5, 6. This brings the non-sharpened surface of the blade 12 into sharpening position.

While the invention has been described with respect to a certain particular preferred example which gives satisfactory results, it will be understood by those skilled in the art after understanding the invention, that various changes and modifications may be made without departing from the spirit and scope of the invention and it is intended therefore in the appended claims to cover all such changes and modifications.

What is claimed is new and desired to be secured by Letters Patent is:

1. In a razor, a frame, means for pivotally mounting a razor blade for movement with respect to said frame, a guard secured to said frame, means for moving said razor blade on its pivotal axis to vary the angle of inclination thereof and to change the position of the shaving edge with respect to said guard, said last named means comprising a cam bar having sections contacting with the lower surface of said blade, said cam bar extending throughout substantially the entire length of said blade, and means for blasing the razor blade into engagement with said cam bar.

2. In a razor, a frame, means for pivotally mounting a razor blade for movement with respect to said frame, a guard secured to said frame, means for moving said razor blade on its pivotal axis to vary the angle of inclination thereof and to change the position of the shaving edge with respect to said guard, said last named means comprising a cam bar having sections contacting with the lower surface of said blade, said cam bar extending throughout substantially the entire length of said blade, and means for blasing the razor blade into engagement with said cam bar.

3. In a razor, a tubular support, a frame carried at one end thereof, sharpening means and positioning means carried by said frame, a rod structure slidable in said tubular support, a support carried by said rod structure for pivotally mounting a razor blade of the single edge type, a spring effective between said rod structure and said tubular support for maintaining said razor blade in shaving position, the rod structure and the support for said razor blade being moveable against the action of said spring to a position wherein the razor blade and its support clears said frame whereupon said rod structure may be rotated to move the razor blade from shaving position to sharpening position, means independent of said sharpening means and said positioning means for engaging the razor blade when in either of said positions for blasing it either to shaving position or sharpening position, the tubular support and the rod structure being incapable, throughout the length thereof, of preventing rotatable movement of said rod structure as specified, and means for positively retaining said rod structure and the support carried thereby in different respective positions wherein the razor blade occupies either its shaving position or its sharpening position.

4. In a razor, a tubular support, a frame carried at one end thereof, sharpening means and positioning means carried by said frame, a rod structure slidable in said tubular support, a support carried by said rod structure for pivotally mounting a razor blade of the single edge type, a spring effective between said rod structure and said tubular support for maintaining said razor blade in shaving position, the rod structure and the support for said razor blade being moveable against the action of said spring to a position wherein the razor blade and its support clears said frame whereupon said rod structure may be rotated to move the razor blade from shaving position to sharpening position, means independent of said sharpening means and said positioning means for engaging the razor blade when in either of said positions for blasing it either to shaving position or sharpening position, the tubular support and the rod structure being incapable, throughout the length thereof, of preventing rotatable movement of said rod structure as specified, and means for positively retaining said rod structure and the support carried thereby in different respective positions wherein the razor blade occupies either its shaving position or its sharpening position, said last named means comprising a pocket formed in said frame, a part of the support carried by said rod structure being received in said pocket when said razor blade occupies either of said positions.

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