SAFETY RAZOR WITH SWINGABLE COVER FOR SINGLE-EDGE BLADES, WITH CUTTING-ANGLE ADJUSTING MEANS, AND/OR WITH HANDLE ADJUSTING MEANS

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Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

Fig. 6

Fig. 7

Fig. 8

Fig. 9

Fig. 10

Fig. 11

Fig. 12

Fig. 13

Fig. 14

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This invention relates to safety razors, and, in certain of its more specific aspects, to safety razors of the type using single-edge blades having reinforced rear edge portions.

Among the objects of the invention are the provision of improved means for adjusting the shaving angle of a razor, the provision of improved means for adjusting the shaving angle of a razor employing a single-edge blade, the provision of improved means for adjusting the length of a razor handle, and the provision of improved means for operating the cover of a razor head of the type commonly used to hold a single-edge blade having a reinforced rear edge portion.

The invention accordingly comprises the features of construction, combinations of elements, and arrangement of parts, which will be exemplified in the constructions hereinafter set forth and the scope of the application of which will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawings in which:

FIGURE 1 is a front view, partly broken away, showing one form of razor embodying the invention;

FIG. 2 is a side view thereof;

FIG. 3 is a vertical sectional view on an enlarged scale along the line 3—3 of FIG. 1;

FIG. 4 is a section along the line 4—4 of FIG. 3;

FIG. 5 is a view similar to FIG. 3, but showing the position of certain of the parts near the top of the razor with the cover open;

FIG. 6 is a view similar to FIG. 3, but showing the lower part of the razor with the handle in the adjusted position;

FIG. 6A is an exploded perspective view of the eccentrically-cooperating soap-bar adjusting elements;

FIG. 6B is a fragmentary sectional view on the line 6B—6B of FIG. 6 on an enlarged scale;

FIG. 7 is a detail side view of the soap-bar adjusting mechanism;

FIG. 8 is a top detail view thereof;

FIG. 9 is an end detail view thereof;

FIG. 10 is a cross section through the soap bar on a greatly enlarged scale;

FIG. 11 is a rear detail view of the stem assembly;

FIG. 12 is a side view thereof;

FIG. 13 is a top view thereof;

FIG. 14 is a top view of the cover-operating spring;

FIG. 15 is a fragmentary end view of a portion of the razor head on an enlarged scale;

FIG. 16 is a partly sectional fragmentary rear view thereof;

FIG. 17 is a detail view of the finger piece; and

FIG. 18 is a bottom plan view of the seat.

In the exemplified embodiment of the invention there is provided a razor 5 comprising a shaving head 6 and handle 7 connected by a stem 8 having a central recess 9 in its upper portion, and carrying at its upper end lateral ears 10 and 11 to which a blade seat 12 is fixedly secured. From the ends of the seat there extend forwardly a pair of arms 14 carrying the usual stops 15 into which the ends of the sharpened edge of a single-edge blade 18 may be pressed. As exemplified, the blade has the usual reinforced or thickened rear portion 19 against which the upper portion of a swingable pressure finger 20 is adapted to exert forward pressure under the influence of a spring 21 when the razor is in shaving position, as shown in FIG. 3. As exemplified, the rear portion 19 of the blade rests on recesses 22 in the seat. The blade extends slightly downwardly with respect to the seat from the finger 20 to the stops 16. The seat is itself sloped somewhat downwardly in a forward direction with respect to the stem 8.

The shaving head also includes a cover 22 having end pieces 23 pivoted on rearward bearings 24 on the ends of the seat, and is adapted to be swung, on the horizontal axis thus provided, from the closed or shaving position of FIG. 3 to the open or loading position of FIG. 5, by the pressure of a spring 28. In the former position the forward edge of the cover presses downwardly on the blade 18. One end portion of the spring 28 is clamped between the ears 10 and 11 and the seat 12, and the other end portion is free and presses against a downwardly-turned rear portion 29 of the cover.

The seat 12 and the spring 28 are formed, respectively, with notches 30 and 31 to accommodate the finger 20, and the finger 20 has a tail 32 fitting into the notch 33 in the stem between the ears 10 and 11 and is swingingly supported by end lugs 34 extending above the ears 10 and 11 at the sides of the notch 33, and rotatably fitting within recesses 35 in the bottom of the seat 12 as well as in the notch 31.

Pursuant to the invention in certain of its aspects, there is provided a particularly simple and effective means, in the form of a cam lever 36, for closing the cover 22 against the pressure of the spring 28. The lever 36 fits in a recessed portion 37 in the rear of the stem 8, and is pivoted at 38 on the stem. It is shaped to provide a pressure surface 39 above its pivotal axis for pushing it into a position which permits the cover to open and a pressure surface 39a below its pivotal axis for pushing it so as to close the cover 22 by means of cam surfaces 40 on either side of a recess 42 which contains the tail 32 of the finger 20 as well as the spring 21 which, when the cover is in closed position, urges the tail 32 rearwardly to swing the upper end of the finger 20 forwardly against the rear edge of the blade 18. The spring 21 is so disposed in the recess 42 that, when the lever 36 is swung to permit the cover to open, the spring 21 is moved clear of the finger 20, allowing it to swing loose so that a used blade may be replaced with a new blade in the usual manner. The lever 36 is preferably made from plastic, whereas the other parts so far described are preferably formed of metal.

The lever 36 carries a slightly resilient downwardly-extending forward arm 44 the end of which is just above a rearward hump 45 in the forward surface of the recess 42 in order to provide a slight resistance to movement of the lever to a position in which it will permit the cover to open, and in order to signal to the user, as by the feel of the movements or by a clicking noise, the swinging movements of the lever.

The razor is provided with a guard member or soap bar 50 which, in accordance with the present invention in certain of its aspects, is pivoted at 51 and 52 on the arms 14 of the seat to permit the swinging of the soap bar on a horizontal axis to vary the distance between the cutting edge of the blade and a rounded surface at the top of the soap bar. The soap bar carries a rearwardly-extending operating bar 54 which carries at its rear end a laterally-extending pivot post 56 fitting into a notch 58 in the forward end of an arm 59 on an operating link 60 which carries an arcuate lip 62 fitting into a longer recessed eccentric in the form of a nearly-annular groove 64 in an op-
Cerating wheel 65 rotatably mounted in the stem 8 by means of a pin 66. The ends of the groove 64 act as stops to limit the rotative movements of the wheel 65. The periphery of the wheel 65 is roughened by transverse grooves 67, and projects thru a forward opening 68 in the stem 8 for operation by the user's thumb and for exposure of numerals which indicate the extent of any adjustment made. An arrow 69 points to the indicating numeral. A spring 70 in a recess 71 in the stem 8 is formed with a bump 72 which is adapted to fit into one or another of the grooves 67 to hold the wheel against accidental displacement from an adjusted position. Since the forward end of bar 50 is rotatably mounted in the fixed pivots 51 and 52, upward movement of the rear end of the operating bar 54 will swing the soap bar on those pivots from the position of FIG. 3 to the position shown in full lines in FIG. 7, thus varying the shaving angle from the line 74 to the line 75 of FIG. 7. The position of the operating bar 54 is controlled by raising (or lowering) of the pivot portion 56, which is brought about by raising (or lowering)—and angulating—the operating link 60 from the position of FIG. 3 to the position shown in full lines in FIG. 7 (or vice versa) due to the eccentricity of the groove 64 with respect to the fixed axis 66 of rotation of the wheel 65. The groove 64 fits into the times in a minor sector of the eccentric circle (in a major sector of which the groove lies) will assume various vertical (and angular) positions with respect to the wheel depending on how much the wheel has been turned. Thus when the wheel is moved from the position of FIG. 3 to the position of FIG. 7, the lip will be moved upwardly with the groove 64 as the eccentric circle of the groove moves upwardly with respect to fixed axis 66 of the wheel, and the link 60 carrying the lip will be moved upwardly so that the forward end of the arm 59 on the link 60 will raise the pivot post 56 on the rearward end of the operating bar 54. Accordingly, the rearward side of the wheel 65 from the position of FIG. 3 to the position of FIG. 7 causes downward movement of the soap bar to vary the shaving angle to a desired extent between the dot-and-dash lines 74 and 75 of FIG. 7; and a reverse movement causes a reversed operation. The various rotor parts are recessed where necessary to accommodate the link 60 in the various positions of the link 60 and of the other parts, the lever 36, for example, being recessed at 77 and 78, and the seat 12 at 79 to accommodate the link 60.

In accordance with the invention in certain of its aspects the rotor is provided with a handle which is longitudinally adjustable in a particularly simple and effective manner. To this end there is provided on the lower end of the stem 8 a slidable sheath 80 in which a bent leaf spring 82 is mounted for movement therewith. The spring moves in a passageway 84 in the stem and resists free movement of the sheath on the stem. The spring 82 is formed at 85 with a bend which is adapted to fit into one or another of recesses 86, 87, and 88 in the stem to hold the sheath in any of three positions wherein it will provide, with the stem 8, a short handle, a handle of medium length, or a long handle, as desired. The stem is formed at its lower end with a protuberance 90. The extent of this protuberance into the passageway 84 and the strength of the spring 82 are such as to prevent passage of the bend 85 of the spring past the protuberance. The spring 82 is formed with a base 92 having four upturned corners 93, with flats 94 therebetween. In assembly, spring 82 is set on the base 85 in the notch 86, and the base 92 lying against the lower end of the stem, and the sheath 80 drawn up over them until the parts are in the position shown in FIG. 3. The sheath 80 is formed of plastic, and the interior thereof is so shaped that it may be moved up over the base 92 of the spring, but that the bent-up corners 93 of the base will dig into the interior of the sheath sufficiently to assure that the spring will move downwardly with the sheath when the latter is moved downwardly to increase the length of the handle. The base 92 thus provides assurance against the movement of the spring longitudinally of the sheath, and also serves, in addition to a shoulder 93 on the sheath, to provide a positive limit to the upward movement of the sheath 80 on the stem 8. There is thus provided a simple and effective construction whereby the sheath may be readily adjusted on the stem to provide a handle of a desired length and may be effectively held in adjusted position.

Since certain changes may be made in the above construction and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. A safety razor for single-edge blades comprising a stem, a blade seat carried on said stem, a cover swingably mounted on said stem between open and closed positions and having a dependent portion at the rear thereof, resilient means urging said cover into open position, and a lever pivotally mounted on said stem and formed with a rearwardly and downwardly extending cam surface engaging said dependent portion to hold said cover closed when said surface is in a rearward position and movable to a forward position out of the path of movement of said dependent portion under the opening action of said resilient means and cummingly engaging said dependent portion when moved rearwardly for moving said cover into closed position.

2. A safety razor for single-edge blades comprising a stem; a blade seat carried on said stem, a cover swingably mounted on said stem, resilient means urging said cover into open position, and a lever pivotally mounted on said stem for moving said cover into closed position, wherein movement of said lever is provided with a rear pressure surface below its pivot point for swinging it in one direction to move said cover to closed position and a rear pressure surface above its pivot point for swinging it in the opposite direction for permitting said cover to be moved to open position by said resilient means.

3. A safety razor for single-edge blades comprising a stem; a blade seat carried on said stem, a cover swingably mounted on said stem, resilient means urging said cover into open position, and a lever pivotally mounted on said stem for moving said cover into closed position, wherein there is provided on said lever and said stem a cooperating means in the form of a resilient arm and a hump over which the arm rides, whereby at least a portion of each of the movements of said lever is resisted.

4. A safety razor for single-edge blades comprising a stem, a blade seat carried on said stem, a cover swingably mounted on said stem, resilient means urging said cover into open position, and a lever pivotally mounted on said stem for moving said cover into closed position, and comprising also a finger adapted to bear against the rear edge of the blade, a recess in the top of said lever, and a spring in said recess adapted to urge said finger against the rear edge of the blade when said lever is in cover-closed position.

5. A razor as in claim 2 wherein there is provided an adjustable soap bar, manually-operable operating means therefor disposed at a forward portion of said stem, and an operating connection extending from said operating means to said soap bar.

6. A safety razor comprising a stem, a blade seat carried by said stem, a cover, an adjustable soap bar, an operating wheel rotatably mounted on said stem and projecting therefrom, a linkage extending from said wheel to said soap bar, and eccentric means for operating said linkage in response to rotative movements of said wheel and comprising an annular eccentric recess in said wheel, and a shorter annular protuberance fitting therein and carried by said linkage.
7. A razor as in claim 6 wherein said soap bar is pivotally mounted on said seat for movement on an axis longitudinally thereof, said linkage comprising an element extending rearwardly from the soap bar and an element pivotally connected to the first-mentioned element and carrying said shorter annular protuberance.

8. A safety razor comprising a stem, a blade seat carried by said stem, a cover, an adjustable soap bar, an operating wheel rotatably mounted on said stem and projecting therefrom, a linkage extending from said wheel to said soap bar, and eccentric means for operating said linkage in response to rotative movements of said wheel, wherein the rim of said wheel is formed with indentations, and wherein there is provided in said stem a spring having a hump adapted to yieldingly fit into indentations aligned therewith.

9. A safety razor comprising a stem, a shaving head mounted thereon, a handle member mounted for longitudinal sliding movement on said stem toward and away from said head between positions wherein said stem and said handle member provide a variable-length handle for the razor, and means within said handle member for retaining the handle member in different longitudinal positions on said stem, said retaining means comprising a longitudinally-arranged series of notches in one of said relatively slidable members and a longitudinally extending leaf spring secured to the other of said members and urging by its own resiliency toward the line of said notches and having a bend engageable in said notches and having a sloping contact with a notch at both sides thereof whereby said bend will engage various of said notches upon relative sliding movement of said members and can be disengaged from various of said notches when sufficient relative longitudinal force is applied to said members to overcome the resilient urge of said spring.

10. A razor as in claim 9 wherein said leaf-spring extends longitudinally of said handle member and has a portion extending laterally in the bottom of said handle beneath the end of said stem, and wherein said handle is formed of solidified plastic and said laterally-extending portion of said leaf spring has a bent-up corner engaging the interior of said handle.

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