Dec. 15, 1953 M. J. CERINO 2,662,281

SAFETY RAZOR

Filed Dec. 18, 1952

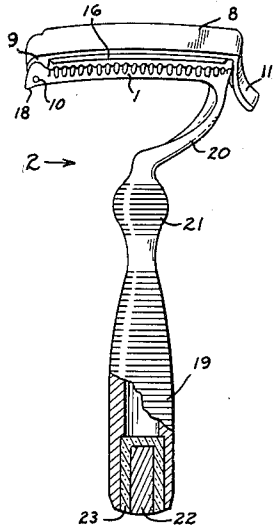


Fig. 1.

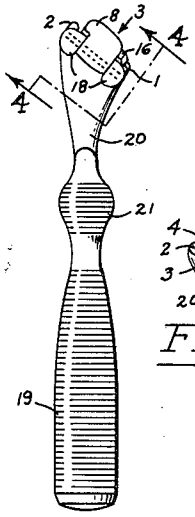


Fig. 2.

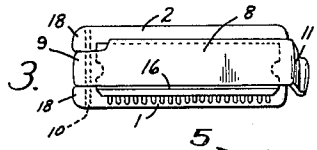


Fig. 3.

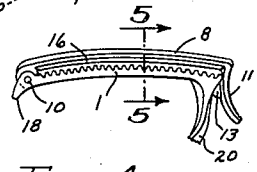


Fig. 4.

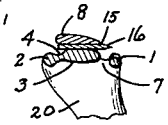


Fig. 5.

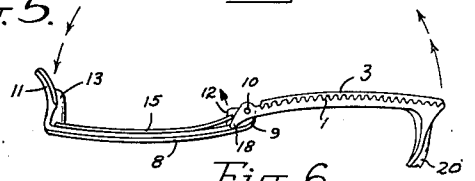


Fig. 6.

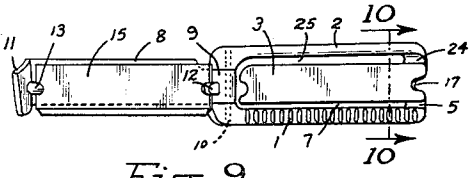


Fig. 9.

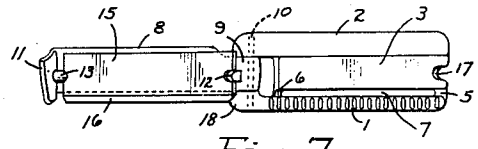


Fig. 7.

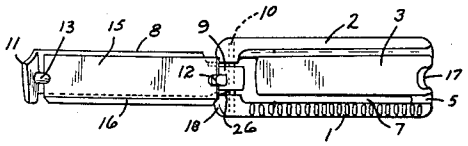


Fig. 12.

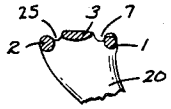


Fig. 10.

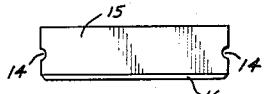


Fig. 8.

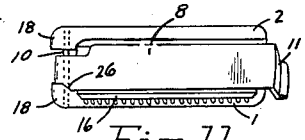


Fig. 11.

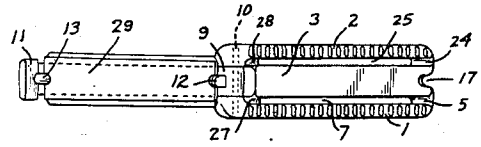


Fig. 13.

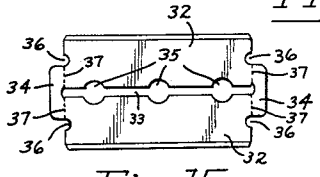


Fig. 15.

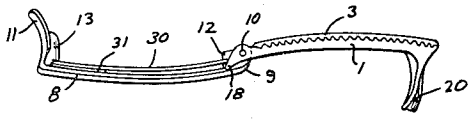


Fig. 14.

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BY Oliver D. Olson

His Agent

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UNITED STATES PATENT OFFICE

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SAFETY RAZOR

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Application December 18, 1952, Serial No. 326,718

9 Claims. (Cl. 30—58)

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This invention pertains to razors, and relates particularly to the novel construction of a safety razor which utilizes blades of the wafer type. This application is a continuation-in-part of my application, Serial No. 682,214, filed July 9, 1946, and entitled Razor, now abandoned.

It is a principal object of the present invention to provide a safety razor having no detachable parts and constructed to hold a wafer blade firmly in proper position for maximum shaving efficiency.

Another important object of this invention is to provide a safety razor in which a wafer blade is ejected automatically upon opening of the blade securing head.

A further important object of the present invention is the provision of a safety razor in which the position of the cutting blade may be adjusted for varying degrees of cutting depth.

A still further object of this invention is the provision of a safety razor which does not tend to become clogged and which is readily cleaned without disassembly.

Still another object of this invention is the provision of a safety razor in which the blade-holding head is adapted to shield the cutting edge of a blade from damage when not in use.

These and other objects and advantages of the present invention will appear from the following detailed description taken in connection with the accompanying drawing, in which:

Figure 1 is a front elevation of a razor embodying features of this invention, a part thereof being broken away to disclose a magnet mounted in the handle;

Figure 2 is a side elevation of the razor as viewed in the direction of arrow 2 in Figure 1;

Figure 3 is a plan view of the razor head as viewed in the direction of arrow 3 in Figure 2;

Figure 4 is a fragmentary front elevation of the razor head as viewed along the line 4—4 in Figure 2;

Figure 5 is a sectional view taken along the line 5—5 in Figure 4;

Figure 6 is a fragmentary front elevation showing the razor head in open position, the arrows indicating the direction of movement of the blade and blade holder during opening;

Figure 7 is a plan view showing the razor head in open position;

Figure 8 is a plan view of a razor blade constructed for use with the razor of the present invention;

Figure 9 is a plan view of a modified form of razor head embodying features of the present invention;

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Figure 10 is a sectional view taken along the line 10—10 in Figure 9;

Figure 11 is a plan view of a further modified form of razor head, the same being shown in closed position;

Figure 12 is a plan view showing the razor head of Figure 11 in open position.

Figure 13 is a plan view of a still further modified form of a razor head embodying features of the present invention;

Figure 14 is a fragmentary front elevation of the razor head shown in the preceding views and illustrating means by which the degree of opening of the head may be restricted; and

Figure 15 is a plan view showing the manner in which single edge blades may be produced from conventional double edge razor blades.

Referring to Figures 1 to 7 of the drawing, the razor illustrated includes a razor head base which comprises a front guard 1, a rear guard 2 arranged in spaced parallel relation with the front guard, and a backing member 3 disposed between the said guards. The backing member and the rear guard are joined together along their abutting edges to form an integral unit. It is to be noted that the junction of the rear guard and backing member is depressed below the upper surface of the latter to form a cleaning trough 4. The backing member is joined at its ends to the front guard by spacers 5 and 6 whereby to provide an elongated cleaning slot 7 therebetween.

As best shown in Figure 7 of the drawing, the right hand end of the front guard, rear guard and backing member are arranged in alignment. The opposite end of the front and rear guards extend beyond the corresponding end of the backing member, however, to form spaced terminals which perform a two-fold function, as described in detail hereinafter.

An elongated blade-supporting member 8 is secured pivotally at one offset end 9 between the spaced terminal ends of the guards 1 and 2 by means of a pin 10. The pin extends through the end 9 of member 8 and is received in holes formed transversely in the said terminals. The blade support is proportioned and arranged to overlie the backing member 3, as explained in detail hereinafter. The opposite end of the blade-supporting member is provided with an offset resilient clip 11. This clip is adapted to snap over the projecting end of the razor head base opposite the pivot pin 10, whereby to secure the member 8 releasably in operative position over the backing member 3.

Referring now particularly to Figures 6 and 7

of the drawing, the blade-supporting member 8 is provided with blade-positioning lugs 12 and 13 formed on the offset end 9 and clip 11, respectively. These lugs are adapted to receive the notches 14 provided at the opposite ends of the razor blade 15, as best shown in Figure 8. The notches are arranged in such manner as to position the single cutting edge 16 of the blade properly with respect to the guard 1 when the razor head is in closed position. The distance between the lugs is preferably equal to or slightly less than the distance between the notches 14. In this manner the razor blade is held in place by virtue of its slight compression and is thereby prevented from dropping out when the razor is opened and inverted. A notch 17 is provided in the alined end of the head to receive the lug 13 when the razor is closed. Lug 12 is accommodated within the space between the end of the backing member 3 and the offset end 9, as best shown in Figure 7.

It is to be noted here that the guards 1 and 2, the backing member 3 and the blade-supporting member 8 are each preferably curved in their longitudinal dimension about a common center. The direction of curvature is such that the inner surface of the blade-supporting member 8 is concaved. Thus, the surfaces of the guards and backing member facing the member 8 are of convex profile. In this manner the flat wafer blade 15 becomes curved when secured in place between the backing member 3 and the blade support 8. It has been determined that by curving the razor blade in this manner it exhibits no tendency to flex or chatter during the shaving operation. The blade has a firm feel against the skin, and the incidence of chipping or cutting the skin ordinarily resulting from blade chatter is substantially eliminated.

The skin-engaging surface of the front guard 1 is grooved or serrated, as shown, to provide a friction surface by which the razor is guided most effectively and for stretching the skin properly during the shaving operation. The rear guard 2 functions primarily as a projecting rest upon which to lay the razor when not in use.

The spaced terminals forming the free end of the front and rear guards are extended outwardly from the pivot pin 10 to form ejector lugs 18. These lugs project outwardly a distance sufficient to intercept the arc of swing of the edge of blade 15 adjacent the positioning lug 12. In this manner, as the blade-supporting member 8 is swung open, the edge of blade 15 adjacent the lug 12 comes into contact with the ejector lugs 18. Upon further movement of the blade support 8 the blade is forced away from the inner abutting surface of the former, the displacement of the blade commencing at the edge adjacent lug 12, as indicated by the arrow in Figure 6. As the blade is raised at the one end, it bends slightly along its longitudinal dimension. Accordingly, upon further opening movement of the member 8 and as the blade is released from engagement with lug 12, the resilient blade tends to straighten out. The blade is thus ejected from the support member 8 with a springing action induced by virtue of its inherent resilience.

It is to be observed, with particular reference to Figure 6 of the drawing, that the ejector lugs 18 project outwardly and obliquely downward in such manner that the blade 15 is ready for ejection when the blade support 8 is extended in substantially the same plane as the guards 1 and 2. Those skilled in the art will recognize that the lugs may project at various other angles, however, depending upon the position desired for the support member 8 to reach before ejection of the blade. The preferred position of member 8 is illustrated in Figure 6, for this is the most convenient position in which to reload a blade into the razor. Means may be provided to limit the degree of retraction of the support 8, as explained in detail hereinafter.

Referring now to Figures 1 and 2 of the drawing, the razor head is connected to a handle 19 in the preferred manner now to be described. Projecting from the inner end of the handle is a shank 20 which curves laterally outward from the longitudinal axis of the handle. The shank widens progressively outward from its connection with handle 19 and is connected at its widened end to the alined end of the razor head, i. e. the end of the razor head opposite the hinge pin 10. The preferred degree of lateral curvature of the shank is such that the longitudinal axis of the handle intersects the razor head at its longitudinal center. The handle also preferably extends substantially normal to the longitudinal axis of the head. Thus, since the head is curved along its longitudinal dimension, the center of curvature is preferably located on a line extending along the longitudinal axis of the handle.

As best shown in Figure 2, the head is preferably tilted in its lateral dimension to form an oblique angle with the longitudinal axis of the handle. Although this angle as illustrated is approximately 56°, it will be apparent to those skilled in the art that other angles may be selected as desired. The lateral dimension of the head may form a right angle with the handle, if so desired, without departing from the scope and spirit of the present invention.

In its preferred form the handle 19 tapers from its outer end to a reduced diameter adjacent the inner end. The inner end is then enlarged to form a substantially spherical grip 21 by which conveniently to manipulate the razor between the thumb and forefinger. The handle is preferably constructed as a hollow casting, as shown, although other constructions may be employed. A knurled or otherwise roughened surface is provided on the handle and grip to enhance the manipulation of the razor in the hand. The outer end of the handle is preferably provided with an axial bore within which a magnet 22 is secured, as by the plastic seal 23. The magnet functions effectively to aid in retrieving razor blades.

Referring now to Figures 9 and 10 of the drawing, there is shown a modified form of razor head. The head comprises the front guard 1, rear guard 2, backing member 3 and blade-supporting member 8 of the structure described hereinbefore. In this modification, however, the backing member 3 is joined to the front guard 1 only at the right hand end by spacer 5, the spacer 6 employed in the previously described head construction being omitted. The backing member is also joined to the rear guard 2 only at the right hand end by spacer 24, thereby providing a rear cleaning slot 25 extending between the rear guard and the backing member.

The backing member 3 is preferably constructed in such manner that its cross sectional area is less than the combined cross sectional areas of the front and rear guards, as shown in Figure 10. Thus, since the left hand end of the backing member is not joined to the guards, and since it possesses a greater degree of resiliency than do

the guards, it is free to move relative to the plane of said guards. Thus, with the backing member disposed above the plane of the guards, the razor blade 15 mounted upon the support 8 engages the backing member before the support is secured in closed position by clip 11. As the support is forced into closed position, the backing member 3 is caused t move toward the plane of the guards. Thus, by providing the resilient backing member the blade 15 is ultimately brought into uniform contact with the support 8 and backing member 3 over the entire securing areas of said latter elements. This provision of a resilient backing member accommodates manufacture of the razor with a lesser degree of precision than does the construction previously described, since precise and uniform spacing between the blade support 8 and backing member 3 when in closed position need not be provided in this latter instance. On the other hand, a firmer base for the razor blade is provided by the construction first described because the backing member 3 does not move relative to the blade support 8.

The modified construction illustrated in Figures 11 and 12 is similar in general details to the structure shown in Figures 1 to 7, but it also accommodates adjustment of the blade support 8, and hence the cutting edge 16 of the blade 15 relative to the front guard 1. This adjustability is provided by reducing the width of the offset end 9 of the blade-supporting member 8. In this manner the said end 9 may be moved laterally along the pivot pin 10 between the limits of the terminal ends of the front and rear guards 1 and 2, respectively. The blade-support 8 is thus capable of being adjusted laterally of the backing member 3, whereby the position of the cutting edge of the razor blade may be varied within limits relative to the front guard 1.

In the forwardmost position of the support 8, as shown in Figure 11, the cutting edge 16 of the blade is fully extended for greatest depth of cutting. The blade is fully retracted for least cutting depth when the support 8 is in its most rearward position. Either of these positions is readily attained by tilting the razor forwardly or rearwardly, respectively, while the blade support is open. The support then slides freely along the pin 10 into abutment with the terminal ends of the guards 1 and 2. The support 8 is then snapped into closed position. The slot 17 is widened laterally to accommodate the positioning lug 13 in any position of the support 8 between the adjustable limits previously described.

It is to be noted that the blade support 8 curves inwardly from its forward edge adjacent the offset end 9 to form a guide 26. This guide functions, as the blade support 8 opens, to engage the forward ejector lug 18 and move the blade support rearwardly from its forward position. In this manner the blade 15 is moved rearwardly so as to engage both ejector lugs 18 for most effective ejection.

In the modification shown in Figures 11 and 12, it is to be noted that the backing member 3 is joined to the front guard 1 only at the right hand end by spacer 5. If desired, this member may also be joined at its left hand end by the spacer 6 in the manner of the structure shown in Figure 7.

The modification shown in Figure 13 of the drawing is a substantial combination of the structures previously described. In this modification the backing member 3 is spaced from both the front guard 1 and the rear guard 2 to provide the cleaning slots 7 and 25, respectively, as in the structure shown in Figures 9 and 10. The backing member 3 is joined to the guards at both ends, however, as in the structure first described. Thus, spacers 5 and 24 join the right hand end of the backing member to the front and rear guards, respectively, while spacers 27 and 28 join the left hand end of the backing member to said respective guards.

In the modification of Figure 13, both the front and rear guards are grooved or serrated, as shown. This construction provides for the use of a double-edge wafer razor blade 29. Accordingly, it is preferred that this head be joined to a handle in such manner that the lateral dimension of the former is arranged at right angles with the longitudinal axis of the latter. This arrangement of the head, as contrasted with the oblique arrangement of the head structure shown in Figure 2, affords most efficient utilization of both edges of the blade 29.

As stated hereinbefore, means may be provided for limiting the degree to which the backing member 8 may be swung open. In Figure 14 such means is provided in the form of a thin, resilient leaf 30. Said leaf is secured, as by the welding 31, soldering or other conventional means, to the inner surface of the blade support 8 at the end adjacent the positioning lug 13. The opposite end of the leaf is unsecured and is therefore free to flex away from the support 8. This free end of leaf 30 is notched in manner similar to the notch 14 provided in the razor blade 15 so that it extends into the lug 12. Thus, the free end of the leaf is arranged to engage the ejector lugs 18 upon opening or retraction of the blade-supporting member 8. Since the leaf is secured at the opposite end to the support 8, however, the end engaging the ejector lugs can merely flex upwardly as the support is opened to eject the overlying blade. Because of the resilience of the leaf, it tends to straighten out from this flexed position. Accordingly, if the support has been opened beyond the position shown in Figure 14, the pressure exerted by the flexed leaf upon the ejector lugs 18 causes the support 8 to swing upwardly to the position illustrated.

Various other forms of means for interengaging the support 8 and razor head may be provided for limiting the degree of opening of the said support. For example, projections may be formed on the razor head base section adjacent the ejector lugs 18 to engage the offset end 9 of the support 8 when the latter is swung open to its maximum desired position.

The single edge razor blade 15 shown in the drawing is preferably constructed in the following manner, reference being made to Figure 15: A double edge wafer blade of the type adapted for use in conventional double edge razors is provided. This type of blade comprises the cutting sections 32 separated by a longitudinal slot 33 and joined together at their ends by the tabs 34. The longitudinal slot 33 extends at least to the tabs 34 and preferably projects into said tabs, as shown. The blade illustrated is also provided with positioning notches 35 for use, if desired, in arranging the double edge blade in a conventional double edge razor.

For purposes of the present invention, the above described conventional double edge blade is provided with notches 36 formed in the ends of the cutting sections 32 adjacent the tabs 34. These notches are preferably disposed midway between the lateral edges of each cutting sec-

tion, as shown. The double edge blade is also provided with score lines or grooves, indicated by the dotted lines 37, which extend transversely of the blade in line with the ends of the sections 32. Thus, the score lines or grooves intercept the longitudinal slot 33.

The score lines or grooves function to weaken the double edge blade along the dotted lines 37. In this manner the tabs 34 may be detached, merely by bending the blade along said lines, to produce a pair of single edge blades of the type shown in Figure 8 for use in the single edge razor of the present invention. It will be apparent that the double edge blade may be retained in the form of Figure 15 and used with conventional double edge razors.

The foregoing razor blade construction is described and claimed in the copending application, Serial No. 70,361, filed January 11, 1949, jointly by me and Errol F. Kingsley and entitled Razor Blade.

It will be apparent to those skilled in the art that various changes in the structural details described hereinbefore may be made without departing from the scope and spirit of the present invention. For example, the handle 19 may be joined to the razor head intermediate the ends of the latter in manner similar to the construction of conventional safety razors. The construction illustrated is preferred, however, since greater range of vision during shaving is afforded by the laterally offset shank 20. The shank is shown joined to the end of the razor head opposite the pivot pin 10, although it may be joined at the said pivot end if so desired.

The front guard member 1 and backing member 3 may be formed as a contiguous unit, in the manner of the rear guard member 2 and backing member 3 shown in Figures 5 and 7, although the spaced arrangement illustrated is preferred for its provision of the cleaning opening therebetween. In any case the guard and backing members function as a unit with respect to the blade and therefore the term guard member as recited in the appended claims is intended to include these members in any desired cooperative arrangement.

Other changes have been indicated hereinbefore. Accordingly, the foregoing description is to be considered as merely illustrative of the invention, the scope thereof being restricted only to the extent indicated by the appended claims.

From the foregoing description it is apparent that the present invention provides a safety razor of simplified and sturdy construction comprising a single unit devoid of detachable parts. Installation of a razor blade is accomplished with facility and precision. Ejection of the blade is effected automatically upon opening of the razor head. The arrangement of cleaning slots and grooves affords thorough and rapid cleansing of the razor without opening of the head or removal of the blade.

A particularly advantageous feature of the razor construction of the present invention resides in the location of the positioning lugs 12, 13 forwardly of the longitudinal center line of the blade-supporting member 8, as best shown in Figures 7, 9 and 12. The distance from the lugs 12, 13 to the rear edge of the member 3 is greater than the distance from the centered notches 14 of the blade to the cutting edge 16 thereof. Thus, when the razor is not in use and it is desired to store the same, the blade may be reversed on the member 8, i. e. with the cutting edge 16 facing the rear side of the razor head. In this position the cutting edge of the blade is confined within the area of the member 8 and is thereby protected against damage. This shielding of the cutting edge of the blade also substantially reduces the hazard of cuts to inquiring children.

Having now described my invention and the manner in which the same may be used, what I claim as new and desire to secure by Letters Patent is:

1. A razor having a handle, a laterally curved shank on one end of said handle, a curved guard attached at one end to said shank, a curved clamp hinged at one end to the opposite end of said guard, a latching lug extending from the concave side of said clamp opposite said hinged end, said hinge also extending from the concave side of said clamp, the extending portions of said latching lug and hinge having centering lugs on their adjacent faces, the hinge portion of said guard having an ejector lug projecting therefrom on the end of its concave side.

2. In a razor using blades of the wafer type and having a notch at each end thereof, the combination of a guard curved along the length of the blade, a handle radial with said guard having a curved shank joined to one end of said guard on its concave side, a clamp curved to conform with said guard and having a latching lug and hinge projecting from opposite ends of the concave side thereof, said hinge being joined to the end of said guard opposite said handle, the adjacent sides of said lug and hinge having centering lugs thereon engaging the end notches on said blade, the guard portions of said hinge having an ejector lug projecting from the arcuate side of said guard and engaging the end of said blade when said clamp is moved to an extreme open position, the blade-engaging faces of said ejector lugs being radical with the hinge axis.

3. A razor comprising a longitudinally curved guard, a longitudinally curved clamp hinged at one end to one end of the guard, a latching lug extending from the concave side of the clamp opposite the hinged end, the hinge also extending from the concave side of the clamp, the extending portions of the latching lug and hinge having centering lugs on their adjacent faces, and lug ejector means projecting from the hinged end of the guard.

4. In a razor having a head for releasably securing a razor blade therein, a laterally curved shank permanently connected at one end to one end of said head and forming an integral part of the latter, the shank extending in the direction of the bottom side of the head and terminating in spaced relation with the latter at a point substantially mid way between the ends of said head, whereby to leave exposed the area under the head extending from the shank to the free end of the head, and a handle extending from the terminal end of the shank substantially normal to said head.

5. In a razor using wafer type blades, the combination of a guard member, a blade-receiving clamp hinged at one edge to one edge of the guard member and adapted to retractably overlie the guard member for securing a razor blade therebetween, and lug ejector means projecting outwardly from the hinged edge of the guard member to intercept the path of the blade as the clamp is swung open away from said guard member.

6. The razor of claim 5 wherein the blade-

receiving clamp is movable along the longitudinal axis of the hinge to adjust the position of the cutting edge of the blade with respect to the guard member.

7. The razor of claim 5 including abutment means on the guard member and blade-receiving clamp arranged for mutual engagement when the blade-receiving clamp is swung open, whereby to limit the degree of said swing.

8. The razor of claim 5 for use with a wafer blade having positioning notches disposed centrally in the opposite ends thereof, the razor including spaced positioning lugs adjacent the opposite ends of the blade-receiving clamp for receiving the notches of the blade therein, the positioning lugs being disposed forwardly of the longitudinal centerline of the blade-receiving clamp whereby when the blade is reversed on the clamp with its cutting edge facing the rear of said clamp the said cutting edge is confined within the area of the clamp for protection during storage.

9. The razor of claim 5 wherein the guard member comprises a guard element and a backing element extending in spaced parallel relation to each other and forming a cleaning slot therebetween.

MICHAEL J. CERINO.

No references cited.