ABSTRACT

The disclosure introduces a new concept in double edge safety razor construction; that of the floating head. A floating head is herein defined as a blade support assembly which is mounted for movement transverse to the path of movement undergone by the pressure guard. A double edge safety razor utilizing a floating head construction of the type herein described for use with double edge blades is insensitive not only to variations in the application of handle pressure but also to other skin aberrations which tend to increase blade pressure. A biased double edge blade support assembly, comprising the floating head, is mounted for controlled pivotal movement toward and away from two skin pressure guards positioned on opposite sides of the razor and integral with the razor handle whereby the principle of the floating head maintains with either of the opposed blade edges. This construction permits a constant blade pressure to be exerted on the skin irrespective of which blade edge is in use or the pressure which is exerted on the handle and skin engaging pressure guard.

7 Claims, 6 Drawing Figures
DOUBLE EDGE SAFETY RAZOR EMBODYING FLEXIBLE BLADE PRESSURE CONTROL

CROSS REFERENCE TO RELATED APPLICATION

This is a continuation-in-part of application Ser. No. 29,788 filed Apr. 20, 1970, now abandoned.

BACKGROUND OF THE INVENTION

The original safety razor development afforded a method of achieving a close shave without the very real danger of serious injury that had previously attended the use of straight razors. Although the safety razor has eliminated the possibility of serious injury, the very knowledge of this fact on the part of the user has tended to increase the number of minor abrasions and "nicks" occasioned by its use since one tends to shave with less care and precision than would be the case were serious injury possible.

Although the evolution of the safety razor and the concomitant development of improved blade alloys and honing techniques have contributed greatly to the ease and comfort of shaving, these prior developments have been primarily concerned with methods of achieving a more precise blade angle control relative to the guard, a faster blade interchange and longer blade life. Present day safety razors show little improvement over the original models insofar as the provision of a true "nick-proof" construction is concerned as is readily apparent to any person who uses such a razor.

The problem is, perhaps, more pronounced in the case of feminine use where the areas to be shaved are not always readily visible; however, even the most experienced shaver is not immune to the skin "nicks" which are caused by hurried or careless shaving. The most common cause of these minor injuries is the application of excessive blade pressure. This may occur, for example, in shaving a particularly sensitive area, such as the neck or underarms, or in the failure to vary pressure application as the blade moves across a varying skin contour.

Although the general proposition of mounting a blade in such a manner that it may undergo relative movement in relation to its supporting handle has been previously recognized, as in U.S. Pat. Nos. 1,479,690; 2,059,172 and 2,125,135; in all of these prior constructions there has been a direct relationship between the pressure exerted by a user on the razor handle and the blade pressure against the skin. Thus in U.S. Pat. No. 2,059,172, the blade edge may undergo limited relative movement parallel to the axis of the razor handle and in U.S. Pat. Nos. 1,479,690 and 2,125,135 the blade edge is pivotally supported to follow the contour of the skin and an excessive pressure application at the razor handle is reflected in an excessive blade edge pressure. Stated differently, the prior art has not recognized the advantages in the provision of a safety razor construction wherein the total blade pressure is due solely to an independent biasing force and is totally independent of applied handle pressure.

The foregoing problems were overcome by the advent of that safety razor construction employing a floating head as described in the aforesaid pending application which related to a single edge razor of the injector type. In essence, that application discloses a pivotally mounted single edge blade support assembly which is biased in the direction of the single ski pressure guard.

SUMMARY OF THE INVENTION

Inasmuch as double edge razors are at least as popular as the single edge type it is obviously desirable that the floating head, or nick proof razor, concept be extended to include double edge blades while yet retaining the general configuration of conventional double edge razors.

The invention resides in the provision of a double edge safety razor having a double edge blade mounting assembly which is mounted for controlled pivotal movement toward and away from the normal path of movement undergone by one or the other of the opposed fixed pressure guards during a shaving operation. The pressure guards may be rigidly secured to the razor handle and the total pressure applied to the skin, by the application of handle pressure, is through one or the other of the pressure guards. An independent biasing force provides the desired blade edge pressure irrespective of which of the opposed blade edges is being used and this force will be the same whether the pressure guard is under a light or heavy pressure application from the handle.

In a preferred embodiment, the pressure guards are rigidly secured to the handle and occupy the same positions relative thereto as do the pressure guards of a conventional double edge safety razor. The blade support assembly is pivotally mounted on the handle assembly to support the blade in overlying relationship to the fixed pressure guards for limited movement of each blade edge toward and away from its respective underlying pressure guard. The blade support assembly may be pivotally mounted directly on the handle structure and, in a preferred form, has a portion thereof including the pivot structure and biasing means telescopically enclosed within a hollow handle whereby the conventional appearance of the razor is maintained. Any desired biasing means such as a coil spring, leaf spring, mass of rubber or the like may be provided to effect the desired biasing force.

The blade support assembly is normally biased to a position centering the double edge blade in relation to the fixed pressure guards to define a conventional blade angle positionment of either edge relative to its respective fixed guard. As the razor is moved along the skin and one or the other of the pressure guards describes its path of travel along the skin surface, the shaving blade edge is held in contact with the skin surface solely by the strength of the biasing force. Any gradient in the skin contour tending to produce excessive blade pressure or any increase in pressure applied to the handle beyond the strength of the biasing force is compensated for by movement of the blade edge, against the biasing force, away from the skin in a direction transverse of the path of movement undergone by the pressure guard. It will thus be apparent that irrespective of the varying skin contour or the applied handle pressure, the blade edge pressure against the skin will never exceed the strength of the biasing force and will, in effect, float across the skin as though being towed by the pressure guard which may be pressed against the skin with any desired force.

The strength of the biasing force is, desirably, adjustable to take into account individual variables as regards toughness of beard, skin sensitivity, etc.
DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a double edge safety razor embodying a floating head;
FIG. 2 is an exploded perspective of the same with a portion of the blade support assembly broken away;
FIG. 3 is a sectional view taken along the line 3—3 of FIG. 1;
FIG. 4 is a sectional view taken along line 4—4 of FIG. 3;
FIG. 5 is a side elevational view illustrating the centralized position of the floating head in normal shaving position;
and
FIG. 6 is a side elevational view illustrating an exaggerated displaced position of the floating head.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The safety razor 10 comprises a handle assembly 12 including opposed generally conventional skin pressure guards 14, 16 integrally joined with a handle portion 18 within the hollow interior of which is pivoted the lower end of a blade support assembly 20 for limited pivotal movement about pivot pin 22 in opposition to the bias of tension spring 24 interconnecting the tail portion 26 of blade support assembly 20 and anchor stud 28 threadedly interconnected with a bias adjusting plug 30 bottomed on the shoulders of flange 32 within handle 18. As will be apparent from an inspection of FIG. 2, skin pressure guards 14, 16 are joined by a web 34 which is rigidly interconnected with handle 18 by yoke structure 36. Blade support assembly 20 includes a generally conventional blade supporting head 38 having a conventional blade clamping assembly including a center bar 40, cross arms 42 and cap members 44 to clamp and release a conventional double edge blade 46 in the usual manner upon rotation of the knurled sleeve 48 to advance or retract spider 50 underlying the clamping assembly. Sleeve 48 is threadedly engaged with an intermediate portion 52 of the blade support assembly for the usual axial adjustment relative thereto.

In FIGS. 1, 3 and 4 is illustrated the central positioning of blade support assembly 20 relative to handle assembly 12. A similar positioning is shown in FIG. 5 wherein the skin surface being shaved is schematically illustrated at 54 and the torque applied to the blade support assembly by the application of handle pressure as indicated at 56, tending to pivot the same about the axis of pivot pin 22, does not exceed the bias imposed by spring 24. Thus, under the aforesaid conditions as illustrated in FIG. 5, blade 46 is centrally positioned above skin pressure guards 14, 16 and assumes a normal angle of attack with respect to skin surface 54. Under the shaving conditions illustrated in FIG. 5, razor 10 functions as a conventional razor since the floating action of head 38 does not come into play until the blade pressure against skin surface 54, tending to rotate the blade support assembly clockwise about pivot 22 as viewed in FIG. 5, exceeds the counter-rotating bias applied thereto by spring 24. The floating head action becomes effective immediately upon the application of that blade pressure against the skin which exceeds the maximum safe cutting pressure as determined by the adjustment of plug 30 to vary the tension of spring 24. This latter condition is illustrated in FIG. 6.

wherein the application of excessive handle pressure, as schematically indicated by the heavy arrow 58, imposes a blade pressure on skin surface 54 in excess of that required for shaving. Thus the clockwise torque imparted to blade support assembly 20 exceeds the counterclockwise bias imposed by spring 24 and the head 38 “floats” to assume an upwardly displaced position, relative to skin pressure guard 16, as illustrated in FIG. 6. With further reference to FIG. 6, it will be appreciated that the indicated application of excessive handle pressure results in an indentation of the skin by skin pressure guard 16 with the blade and its supporting head merely floating upwardly to maintain the same blade pressure thereagainst as though a proper handle pressure were being applied.

The manner in which the razor may be assembled from its component parts will be apparent from an inspection of FIGS. 2 and 3. The tail portion 26 of the blade support assembly with its interconnected spring 24 and stud 28 are inserted through a central opening 60 in web 34 and into the hollow interior of handle 18. Stud 28 is generally rectangular in cross section and extends through a similarly shaped opening 62 circumscribed by the flange 32 formed in handle 18. Pin 22 is then inserted through openings 64 formed in handle 18 and corresponding bore 66 in blade support assembly 20. Plug 30 is then inserted at the lower end of the handle and rotated to draw stud 28 into threaded bore 68 until the desired tension is established in spring 24. The razor is now ready for use in the manner described and insures that the application of blade pressure to the skin is a function of pre-established spring tension rather than applied handle pressure.

Although conventional guards 70, which are a part of the floating head, are not required for the practice of the invention, they do contribute to increased shaving comfort and are desirably utilized to facilitate manufacturing since the floating head itself, including guards 70, may be purchased separately from conventional razor manufactures and modified in accordance with the aforesaid floating head concept.

I claim:

1. A double edge safety razor, comprising; a handle assembly including opposed skin pressure guards; a blade support assembly for mounting the opposed edges of a double edge blade in parallel juxtaposed relation to the corresponding opposed pressure guards; and means mounting said blade support assembly on said handle assembly for floating movement of said blade edges transversely of the pressure guards.

2. The razor of claim 1 including means for biasing said blade into a central position relative to said pressure guards.

3. The razor of claim 2 wherein said blade support assembly includes a blade clamping head and manual actuating means for clamping and unclamping a blade.

4. The razor of claim 3 wherein said handle assembly includes an elongate hollow handle, said blade support assembly including an integral elongate extension extending into said hollow handle; and said first named means including pivot means interconnecting said handle and elongate extension to define an arcuate path of floating movement for said blade edges relative to said pressure guards.
5. The razor of claim 4 wherein the means for biasing said blade includes spring means reacting between the handle assembly and blade support assembly.

6. The razor of claim 5 including means for adjusting the bias of said spring means.

7. A double edge safety razor, comprising; a handle assembly including opposed skin pressure guards adapted to be alternately drawn along a skin shaving path in contact therewith; double edge blade support means for supporting one or the other of opposed blade edges in juxtaposed skin engaging trailing relationship to a respective pressure guard as the same moves along a skin shaving path; and means engaging said handle assembly and blade support means floatingly supporting the latter relative to the former for transverse movement of both blade edges relative to the shaving path.