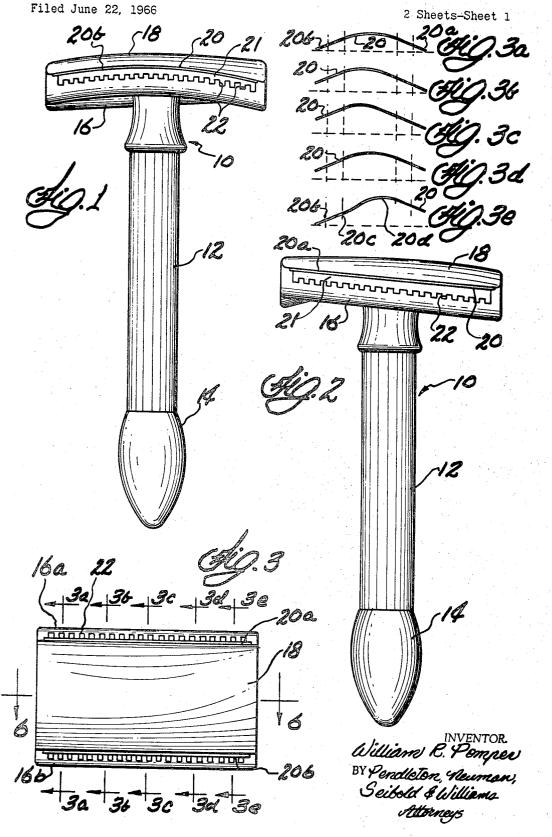
Oct. 29, 1968

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3,407,496

RAZOR HAVING A PLURALITY OF BLADE EDGES OF DIFFERENT CONTOURS

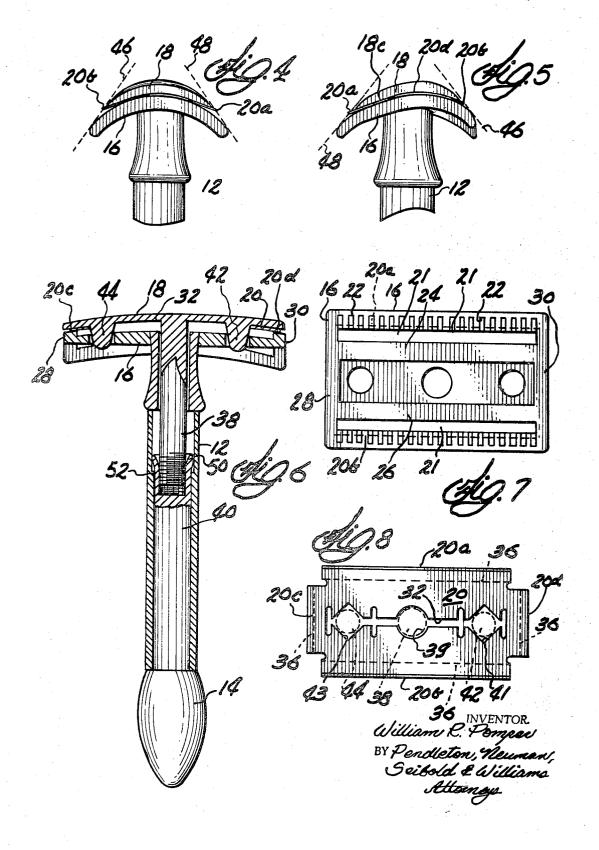


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RAZOR HAVING A PLURALITY OF BLADE EDGES OF DIFFERENT CONTOURS Filed June 22, 1966 2 Sheets-Sheet 2



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3,407,496 RAZOR HAVING A PLURALITY OF BLADE EDGES OF DIFFERENT CONTOURS William R. Pomper, Highland Park, Ill. (140 S. Dearborn St., Chicago, Ill. 60603) Filed June 22, 1966, Ser. No. 559,512 5 Claims. (Cl. 30-49)

ABSTRACT OF THE DISCLOSURE

A razor having a plurality of unique cutting edges particularly adapted for use by women wherein one edge is disposed at a natural diagonal cutting angle while the other is arcuate.

This invention relates to an improved razor and, more particularly, to an improved safety razor having a plurality of unique cutting edges, the razor being particularly 20 adapted for use by women.

There are many types of razors available in the market place but one of the most common and popular for many years has been the safety razor employing a blade of thin hardened steel having two generally parallel sharpened 25cutting edges. Although this safety razor is much easier to use and requires less skill than the well-known straight razor, nevertheless because of the shape of the blade and the precision of the edge, it is often common to encounter difficulties with cutting and marring of the skin. This is 30 often the result of the blade corners engaging crevices, blemishes or discontinuities in the skin surface. While men have encountered difficulties with the corners of the cutting edge of a blade in a conventional safety razor, the problems in this regard have been much greater in the 35 case of women who employ a safety razor on leg and underarm surfaces which are contoured and difficult to shave without knicking and other surface damage.

While various electric razors have been proposed for use by women, these two have proven quite unsatisfactory and the double-edge safety razor remains the principal tool employed by women in their personal grooming.

Over the years that double-edge safety razors have been in use, there have been many proposals for the improvement of the operation and use thereof. For example, Wennmann Patent No. 2,169,574, proposes a safety razor employing a double-edge blade wherein the blade is forced to assume an offset cylindrical shape to provide diagonal cutting edges and, therefore, an improved and more natural shaving angle. Such a razor is commercially available and within its limited sphere does provide improved shaving results.

Grotenhuis Patent No. 1,974,569 reflects another effort at modified use of a conventional razor blade that it provides a mounting means for forcing the blade into an arcuate shape for use in shaving hollow body portions and the like. Each of these devices provides some improvement over the normal operation of a conventional safety razor. However, neither alone provides a device capable of operating on all of the body surfaces which are usually shaven clean. 60

It is, therefore, one principal object of this invention to provide an improved safety razor especially adapted to shave all of the body surfaces which are normally clean shaven.

It is another object of this invention to provide an improved safety razor which will shave the leg, face or underarm surfaces without exposing the surfaces of the body to damage from the edges or corners of the safety razor blade.

It is still a further object of this invention to provide an improved safety razor in which a pair of cutting edges 2

are provided, each having a unique shape adapted to shave a particular body surface.

Another object of this invention is the provision of an

improved safety razor uniquely designed and adapted to support a centrally open, double-edge thin, flexible, steel blade with one of the edges thereof forming an arcuate shaving edge especially adapted for concave body surfaces and the other cutting edge thereof being diagonally disposed with respect to the razor handle for optimum natural shaving of flat body surfaces.

Other objects of this invention will become manifest from a consideration of this description, the accompanying drawings and the appended claims.

In one form of this invention, a razor is provided having a handle with a supporting head portion secured thereto, a clamping head portion threaded into the handle and a thin, flexible centrally open steel blade clamped and secured between the two head portions.

Furthermore, the supporting and clamping head portions are uniquely shaped to maintain the two cutting edges of a centrally open double-edge blade with unique configurations designed for optimum shaving of all body surfaces. In the preferred embodiment of the invention, this involves a support in which one cutting edge of the blade is formed into an arcuate configuration for shaving hollow or concave body surfaces while the other cutting edge is disposed at a large acute angle with respect to the handle axis for natural diagonal shaving. The head portions are shaped and configured to maintain the optimum cutting angle along the entire length of both cutting edges while the thin, flexible blade is distorted as described above.

For a more complete understanding of this invention, reference will now be made to the accompanying drawings wherein:

FIG. 1 is a front elevational view of one embodiment of this invention showing an arcuate cutting edge;

FIG. 2 is an opposite elevational view of the embodiment of FIG. 1 showing a diagonal cutting edge;

FIG. 3 is a top plan view of the razor of FIG. 1; FIGS. 3α -3e are sectional views taken along the lines

3a-3a through 3e-3e in FIG. 3 and illustrating the manner in which the flexible steel blade is distorted to maintain the optimum cutting angle along both cutting edges while also maintaining the desired arcuate and diagonal configurations;

FIG. 4 is a fragmentary side view of the razor taken from the left side in FIG. 1;

FIG. 5 is a fragmentary side view of the razor taken from the right side of FIG. 1;

FIG. 6 is a sectional view taken on the line 6-6 in FIG. 3;

FIG. 7 is a top view of the supporting head portion of the embodiment of FIG. 1; and

FIG. 8 illustrates the thin, flexible double-edge steel blade preferably used in the described embodiment of the invention.

Referring now to the drawings and, more particularly, to FIG. 1, the razor 10 includes a cylindrical handle 12 with a rotatable knob 14 mounted at one end thereof and a supporting head portion 16 rigidly secured to the opposite end thereof. A clamping head portion 18 is secured against the supporting head portion 16 and is maintained thereagainst by threaded engagement with an extension of the rotatable knob 14. A double-edge, thin, steel blade 20 is clamped between the supporting head portion 16 and clamping head portion 18 in a precise configuration to maintain the optimum cutting angle along the entire length of both edges thereof.

As shown in FIG. 1, the forward portions of the supporting head portion 16 and clamping head portion 18 have cooperating clamping surfaces which maintain the forward cutting edge 20b of blade 20 in an arcuate configuration and at the proper shaving angle. An elongate open space 21 is defined in the supporting head portion 16 to permit free cutting action of blade 20 and to pass accumulating soap or cream away from the edge. 5

As shown in FIG. 2, the opposite halves of the supporting head 16 and clamping head 18 support the opposed cutting edge 20a of the blade 20 along a diagonal appropriate for natural cutting action in shaving smooth relatively flat body surfaces.

The top view of the razor, FIG. 3, illustrates the relationship between the clamping head portion 18, the diagonal cutting edge 20a of the blade 20, the arcuate cutting edge 20b of the blade 20, the diagonal face guide 16a of the supporting head portion 16 which includes 15 comb cuts 22 to pass soap or cream to the opening 21 and maintain free access to the cutting edge and the arcuate face engaging portion 16b of the supporting head portion 16 all arranged to provide the two desired cutting edges in a single integrated unit. 20

The construction of the actual shaving head can be best seen in the cross-sectional view of FIG. 6 and the top view of the supporting head portion of FIG. 7. As seen in FIG. 7, the supporting head portion 16 defines a rectangular blade clamp comprising two elongate clamping surfaces, diagonal surface 24 and arcuate surfaces 26, which engage the blade along two parallel lines spaced inwardly from each of the two cutting edges. Associated with the elongate clamping surfaces 24 and 26 are left and right transverse clamping surfaces 28 and 30. The 30 four orthogonally related clamping surfaces 24-30 engage the blade in such a manner that the cutting edges throughout their entire length are maintained at the proper cutting angle while the blade surfaces are distorted into an arcuate and a diagonal configuration. The approximate 35 location of the cutting edges 20a and 20b are identified by broken lines in FIG. 7. In one preferred embodiment of the invention, the diagonal cutting edge 20a is disposed at an 86° angle with respect to the handle axis 40 and the arcuate cutting edge 20b is formed with a radius of curvature of approximately four inches. The foregoing have been found to provide highly desirable results in normal operation.

The double-edge, thin, flexible steel blade normally used in the razor illustrated and described herein is shown 45 in FIG. 8. As can be seen, the two cutting edges 20a and 20b are substantially parallel and the body portion 20 is provided with a central elongate opening 32. The opening 32 provides freedom for relative movement between the separated portions of the double-edge blade 20 while the 50 interconnecting end portions 20c and 20d maintain the desired spatial relationship between the blade edges. Enlarged openings 41 and 43 are provided to locate the blade over pins 41 and 43, while opening 39 is provided to pass head shaft 38. 55

As will be understood from a comparison of FIGS. 7 and 8, the clamping action on the double-edge flexible steel blade 20 occurs substantially along the broken lines 36 in FIG. 8. It has been discovered that by use of properly shaped supporting and clamping surfaces, it is possible 60 to reshape a thin, flexible steel double-edge razor blade to assume the arcuate and diagonal positions desired for optimum shaving comfort and ease. The clamping action of the transverse clamping surfaces 28 and 30 in cooperation with the clamping head portion 18 is clearly 65 illustrated in FIG. 6.

The razor is assembled in the manner described hereinafter. The knob 14 is rotated to release the threaded connection between the solid shaft 38, which is formed an integral part of the clamping head portion 18, from the 70 internally threaded knob shaft 40. Continued rotation of knob 14 frees the shaft 38 from the associated knob shaft 40 and the head is removed. A double-edge razor blade, such as blade 20, is then placed over the two locating pins 42 and 44 integrally formed with the clamping 75

head portion 18 and the blade 20 and head portion 18 are replaced on the supporting head portion 16 with the shaft 38 extending downwardly into the hollow handle 12. Clockwise rotation of the knob 14 causes the knob shaft 40 to threadedly engage the head shaft 38 and draw the clamping head portion 18 down against the supporting head portion 16 and thereby clamp the blade 20 therebetween.

The central portion of the blade 20 has been removed to provide elongate opening 32, as already described, so that the two elongate edges may, if the forces so dictate, assume quite different positions. Nevertheless, the end portions 20c and 20d are tightly clamped to provide the desired cutting angle along both cutting edges.

The optimum cutting angle is illustrated in FIGS. 4 and 5. In FIG. 4, it can be seen that the uppermost end of the diagonal edge 20a is substantially aligned with the end of the arcuate edge 20d. This relationship can best be seen in FIG. 3a. This end of the supporting head portion 16 is generally symmetrical and the clamping head portion 18 is shaped to conform thereto. The relative shapes of the supporting head portion 16 and clamping head portion 18 are such that the free edges 20a and 20b of the blade are maintained at the optimum cutting angle with the optimum blade exposure beyond the broken lines 46 and 48 which define the normal surface to be shaven.

FIG. 5 illustrates the opposite side or end of the head showing first that the diagonal edge 20a of the blade 20 is substantially below the arcuate edge 20b at the offset end of the head. This is clearly illustrated in FIG. 3e of the drawings. In addition to the angular or offset configuration of the supporting head portion 16 and clamping head portion 18 at this end of the head, the head portions are uniquely shaped immediately adjacent the lower end of the diagonal edge 20a at head portion 18c to provide the proper cutting angle along the edge 20a. The cutting angle at the lower end of the diagonal edge 20a is maintained the same with respect to the broken line 48 which defines the face surface so that uniform shaving is obtained over the entire length of the diagonal edge 20a even though the blade 20 is distorted and rigidly clamped in the intermediate area 20d. The approximate shape of the blade at the center of the head is illustrated in FIG. 3c while intermediate configurations are illustrated in FIGS. 3b and 3d.

The knob 14 and shaft 40 are maintained within the handle 12 by a flare 50 which is formed at the threaded end of the knob shaft 40. The handle 12 is shaped with an enlarged free end-defining step 52 which cooperates with flare 50 to resist removal of the knob 14 in normal usage. Thus, a two part razor is provided which greatly facilitates the insertion and removal of razor blades when the device is in use.

While one particular embodiment of the invention has been described in detail, it will be immediately apparent that the shape of the handle, the manner in which the handle and head portions are assembled, and the precise shape of the blade and the various parts of the head may be varied and altered without departing from the spirit and scope of this invention. For example, the comb cuts 22 formed in the two face engaging portions 16a and 16bof supporting head portion 16 may be eliminated and the face engaging portion may be reshaped to fit the desires or habits of the customer.

Moreover, the parts may be formed on machine tools and welded or swagged together or the parts may be formed by die casting or similar automatic processes. While all of the parts are preferably made of metal, they may be fabricated of high strength plastics if desired.

Without further elaboration, the foregoing will so fully explain the character of my invention that others may, be applying current knowledge, readily adapt the same for use under varying conditions of service, while retaining certain features which may properly be said to constitute the essential items of novelty involved, which items are intended to be defined and secured to me by the following claims.

What is claimed is:

1. A razor comprising a generally rectangular head portion defining two surface engaging edges, a generally 5 rectangular clamp portion defining two surface engaging edges similar to the edges of said head portion, a generally rectangular blade of thin flexible metal and having two substantially parallel cutting edges, handle means extending from said head and clamp portions and generally nor-10 mal thereto, and means securing said head portion, blade and clamp portion in overlying relationship, said cutting edges extending outwardly from between the corresponding surface engaging edges of said head and clamp portions, said head portion and clamp portion being shaped 15 with one of the surface engaging edges arcuate and the other of the surface engaging edges disposed at a large acute angle with respect to said handle to provide an arcuate cutting edge and a diagonal cutting edge, one pair of corresponding ends of said arcuate and diagonal cut- 20 ting edges lying approximately in a plane normal to the axis of said handle and the other pair of corresponding ends of said arcuate and diagonal cutting edges being relatively displaced a significant amount along the axis of said handle, the clamp portion and head portion engaging 25 the blade along substantially smooth elongate lines adjacent said cutting edges to clamp the blade and control the transverse curvature of said blade to provide the proper blade angle at said cutting edges.

2. The razor of claim 1 wherein said other end of the arcuate cutting edge is relatively displaced from the corresponding end of the diagonal cutting edge in the direction of the handle.

3. The razor of claim 1 wherein the smooth elongate clamping lines are uniformly spaced inwardly from said cutting edges and adapted to engage said blade along two generally parallel lines.

4. The razor of claim 3 wherein elongate material passageways are formed in said head portion immediately adjacent said cutting edges and outwardly of said clamping lines.

5. The razor of claim 2 wherein the transverse shape of said head portion and said clamp portion between said one pair of ends is substantially circular and wherein the transverse shape of the head portion and the clamp portion between the other pair of ends is substantially circular adjacent the diagonal edge and straightened adajacent the arcuate edge.

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