June 7, 1955 G. T. RANDOL 2,709,851

SAFETY RAZOR

Filed April 23, 1952

Fig. 1.

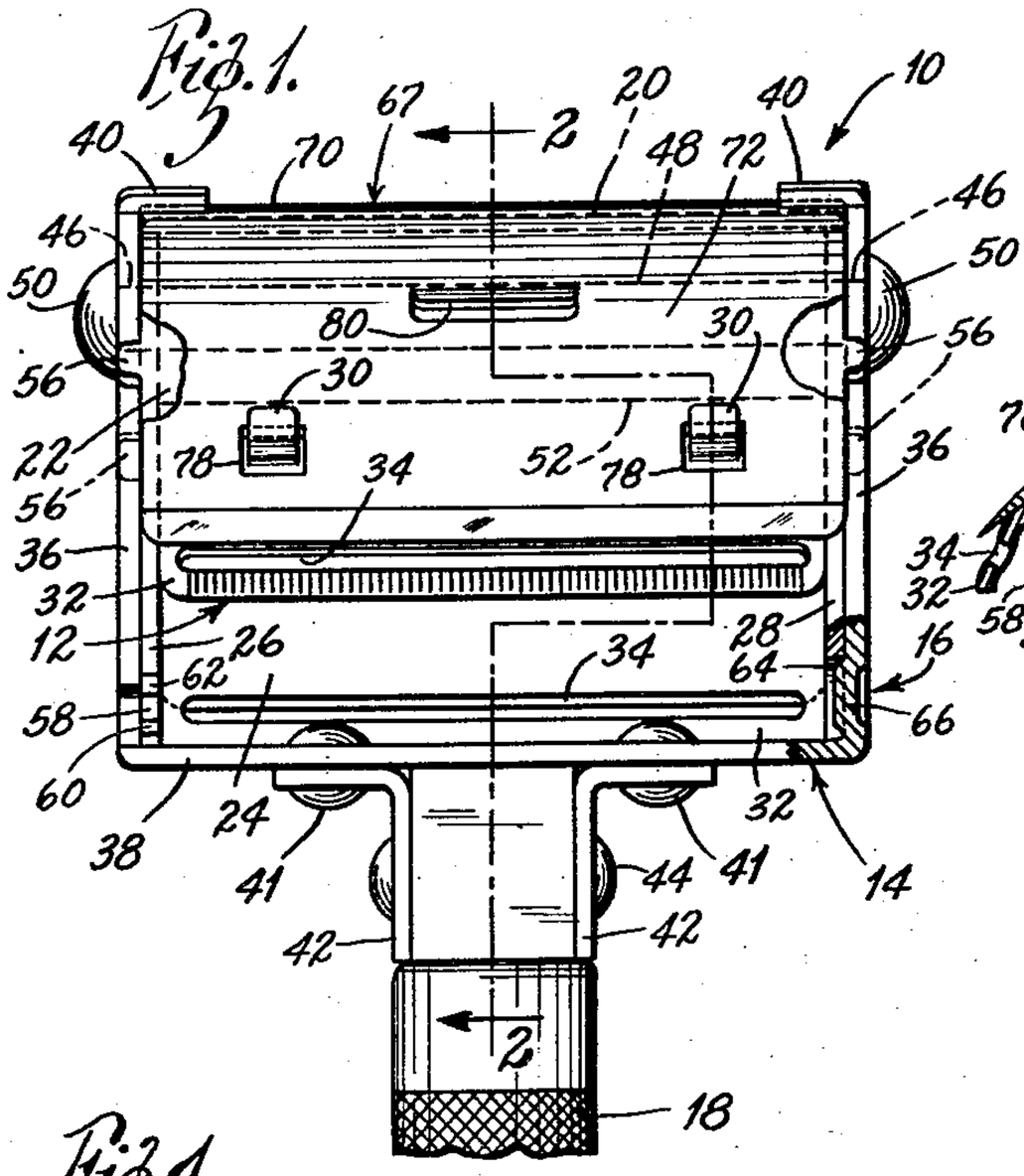


Fig. 2.

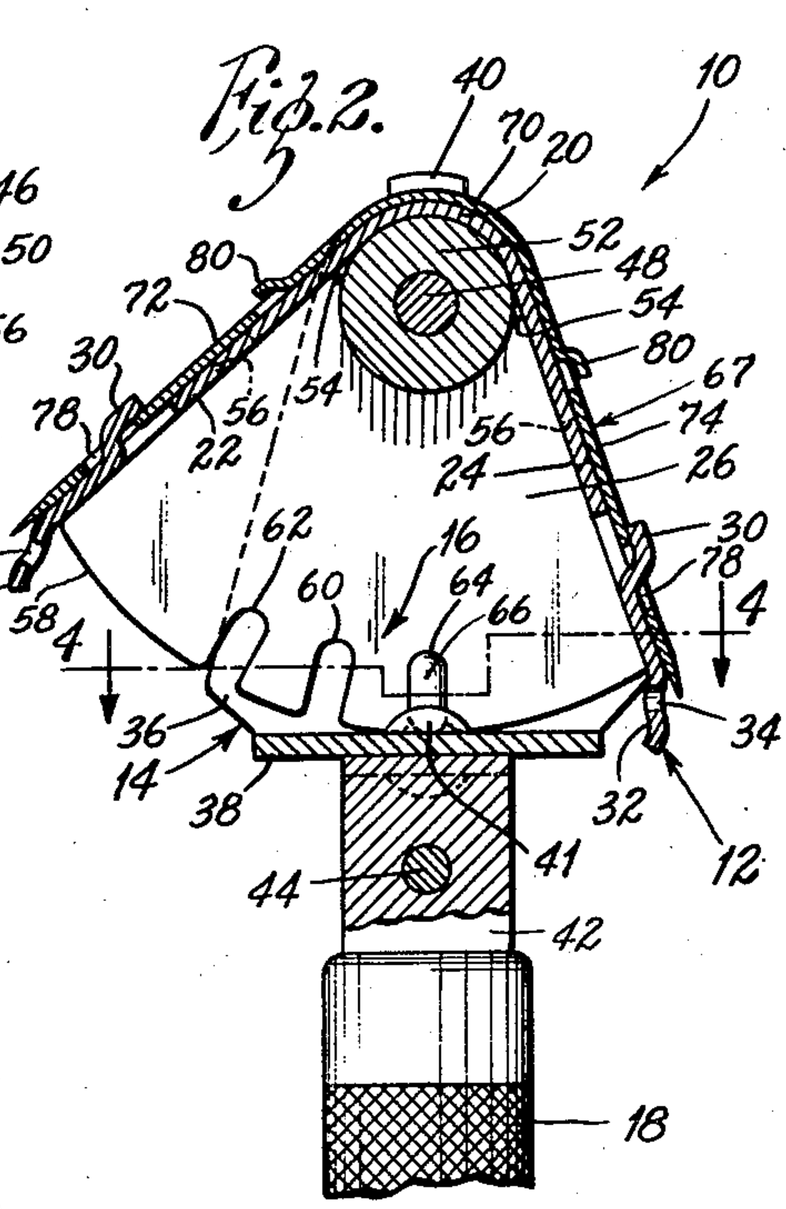


Fig. 4.

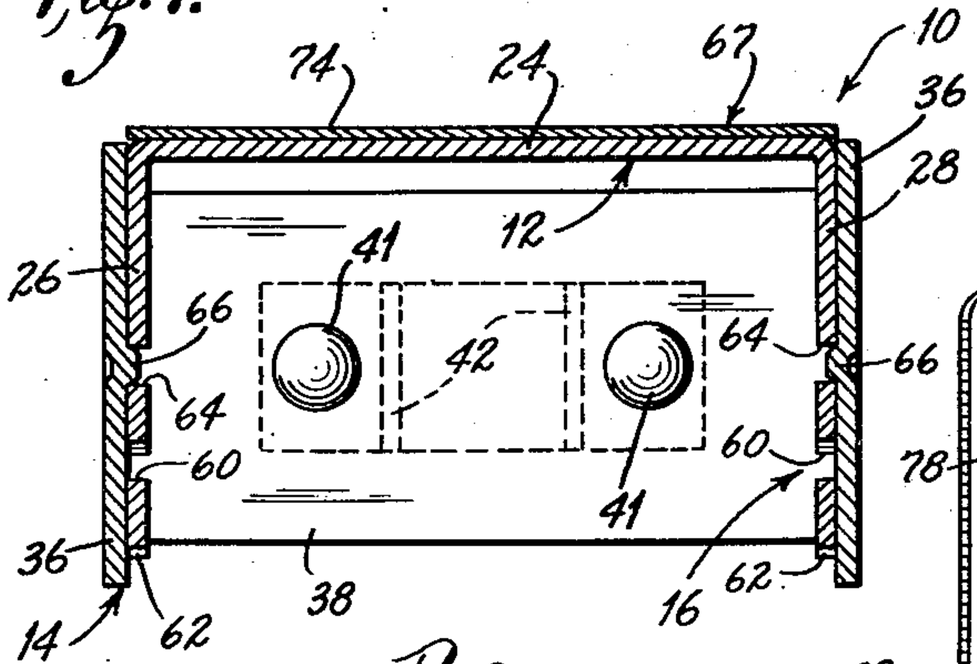


Fig. 3.

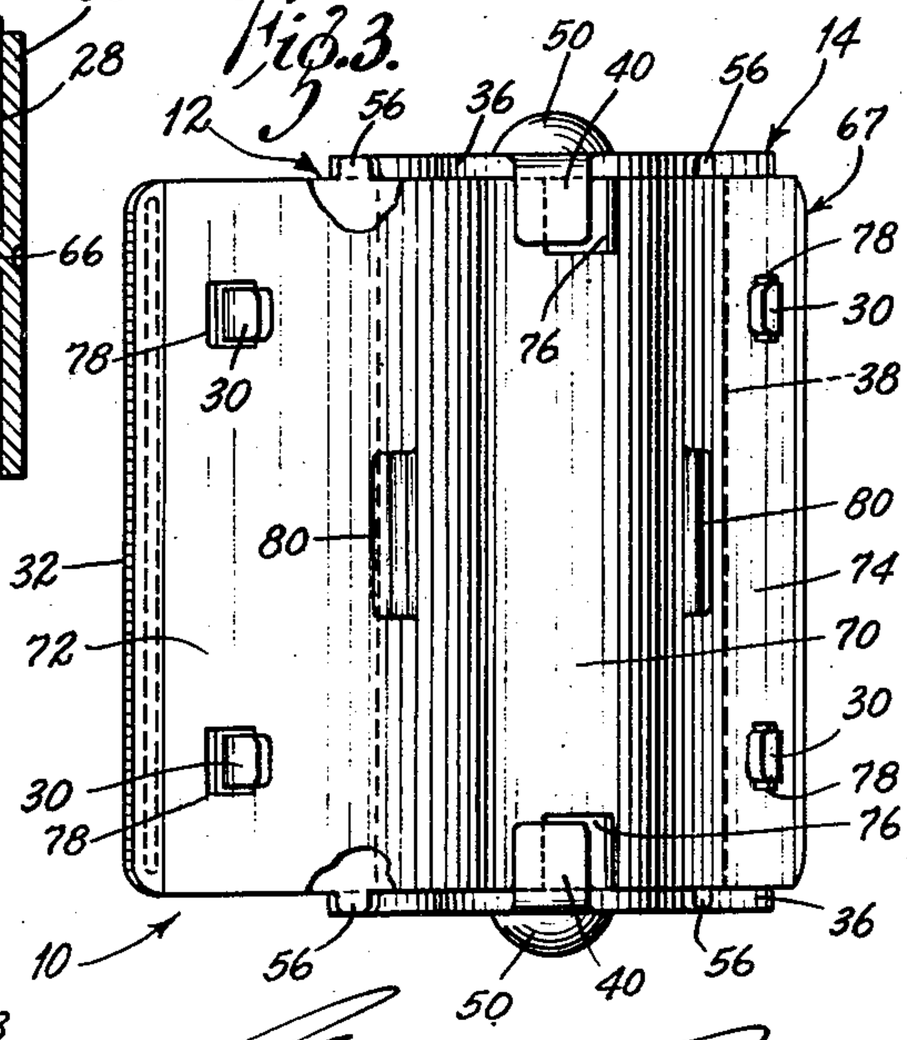


Fig. 5.

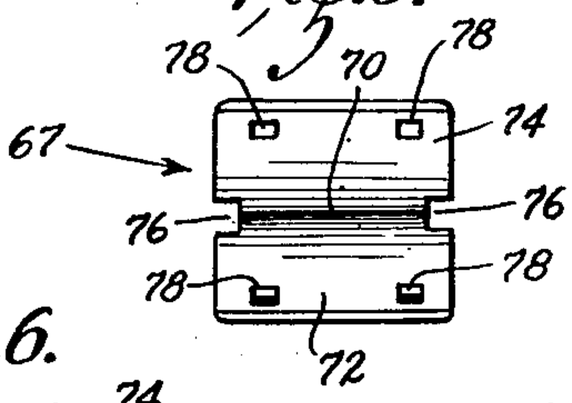


Fig. 6.

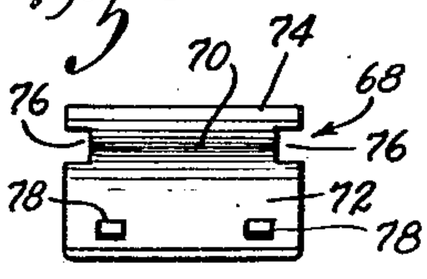
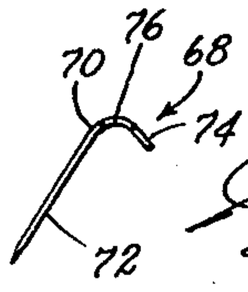


Fig. 7.



Inventor.

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SAFETY RAZOR

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11 Claims. (Cl. 30—57)

The present invention relates to a novel safety razor construction which incorporates means whereby expendable generally V-shaped blades, provided selectively with either one or with two cutting edges, may be quickly and easily positioned, adjusted for use, cleansed during use, and finally removed.

As pointed out in my copending application, Serial Number 280,566, filed April 4, 1952, the personal injury factor incident to the placement and subsequent removal of conventional two-edged blades has been receiving considerable attention by those engaged in the manufacture of razors.

However, insofar as I am aware, prior to the disclosure in my said pending application, the only practical solutions which had been evolved require the use of a loading device for positioning the blade, but no solution had been evolved for effecting the subsequent removal of the blade without risk of personal injury.

The primary object of the present invention therefore, is analogous to that set forth in my prior application: the provision of a novel safety razor adapted to eliminate the risk of personal injuring during blade placement and removal operations.

To achieve this objective, the invention provides a frame, of generally inverted V-shaped contour, adapted to receive and support a V-shaped blade; means for releasably retaining the blade in position on said frame during a shaving operation; a bracket secured to one end of a handle, and means for pivotally mounting the frame on said bracket; means for releasably maintaining said frame and the blade supported thereon in a selected operative position of angularity relative to the vertical centerline of said handle; and means for effecting the removal of the blade subsequent to a shaving operation without risk of personal injury, as will appear.

Another object of this invention is to provide a novel razor construction which, though directed toward the attainment of similar objectives, requires fewer parts than the construction disclosed in my copending application.

Features and advantages not specifically mentioned above, will be apparent from the detailed description of the invention to follow, reference being had also to the accompanying drawing wherein the principal views are illustrated on an enlarged scale for clarity of detail.

In the drawings:

Figure 1 is a side elevational view of the head or upper end portion of a razor which embodies the principles of the present invention;

Figure 2 is a vertical sectional view taken substantially along the line 2—2 in Figure 1;

Figure 3 is a top plan view of the razor, with portions broken away to more clearly present a feature of the invention;

Figure 4 is a sectional plan view taken on line 4—4 of Figure 2;

Figure 5 is a top plan view of a V-shaped razor blade provided with two cutting edges;

Figure 6 is a similar view of a V-shaped razor blade provided with one cutting edge; and

Figure 7 is a right end view of the blade portrayed in Figure 6.

Referring to the drawings:

In Figures 1 through 4, the razor construction embodying the instant invention is indicated generally by the reference numeral 10.

Broadly, the construction includes a blade receiving and supporting frame designated 12; a channel shaped bracket 14 for pivotally mounting said frame; complementary notch and detent means 16 provided on said frame and bracket for releasably maintaining said frame and the blade mounted thereon in a selected operative position of angularity relative to the vertical centerline of the razor; a handle 18 and means associated therewith for mounting the foregoing structure on the upper end portion of said handle; means integrally formed on the frame aforesaid for releasably retaining a blade in position thereon during shaving operations; and means also integrally formed on said frame for limiting the rotational movement thereof about its pivotal mounting.

As best seen in Figure 2, the body portion of frame 12 may be said to be of inverted V-shaped configuration, including a substantially semi-circular apex segment 20 integral with an angularly disposed left-hand segment 22, and with a similar right-hand segment 24. Frame 12 also includes integral left and right end wall segments 26 and 28 respectively, these being identical and having formed therein the notch arrangement included in the means 16, as will appear hereinafter.

As illustrated particularly in Figures 2 and 3, each of the angularly disposed segments 22 and 24 of frame 12 is provided with a pair of longitudinally spaced and aligned ears 30, the latter pressed outwardly from the surrounding body portion of the segment and co-planar therewith. Each of said segments also terminates in a guard portion 32 of the contour shown. An elongated slot 34 is formed in each of said guard portions as Figure 1 demonstrates.

The bracket 14 includes a pair of upwardly extending leg portions 36 joined by a web portion 38. Each of the leg portions 36 terminates at its upper end in an integral inwardly projecting lug 40, which, viewed endwise as in Figure 2, is arcuately formed for a reason to appear.

As Figures 1 and 2 clearly demonstrate, the bracket 14 is rigidly mounted on the handle 18 by means of rivets 41 which extend through aligned vertical apertures in the web portion 38 and angle plates 42, in conjunction with a rivet 44 which extends through aligned horizontal apertures in the upper end of handle 18 and the plates 42.

Formed centrally in each of the legs 36 at a predetermined distance below the lug 40 thereon, is a circular opening 46 for supporting one end of a longitudinal rod 48 which as shown, terminates in headed or peened over portions 50, whereby both endwise and rotary movements of the rod are prevented.

Numeral 52 designates a hollow cylinder rotatably mounted on said rod, and extending from the inner face of frame end wall 26 to the inner face of frame end wall 28. As suggested at 54 in Figure 2, the apex segment 20 of frame 12 is welded or otherwise rigidly secured to said cylinder, so that the latter will hereinafter be considered an integral part of said frame as the preferred construction. Obviously, the said end walls are also apertured to accommodate the supports for rod 48.

From the immediately foregoing paragraphs, it should be manifest that the frame 12 including the hollow cylinder 52, is pivotally supported between the legs 36 of bracket 14 for rotary movements about the rod 48. However, with particular reference to Figures 1 and 3, it is noted that the rotary movement of frame 12 is

limited by the provision of abutments 56, integrally formed and co-planar with the segments 22 and 24 of said frame, and adapted to engage against the edges of legs 36 of the bracket 14.

With reference presently directed to Figures 2 and 4, the means 16 for releasably maintaining frame 12 in a selected one of three positions for example, intermediate the extreme or limited positions thereof will be described.

It is noted that the end walls 26 and 28 of frame 12 are sector shaped, so that the lower peripheral edges 58 of said walls are arcuate. Extending upwardly from each arcuate edge 58 is a series of radial notches as shown. Numeral 60 designates the central notch in each of said walls, numeral 62 the left-hand notch, and numeral 64 the right-hand notch.

As viewed in Figure 2, an inwardly pressed detent 66 is provided on the vertical centerline of bracket 14 in each of the legs 36. Said detents are of a configuration adapted to enter any one of the notches 60, 62, or 64 during the swinging movements of frame 12, as should be apparent.

It is noted at this time that the three notches illustrated and described are exemplary only, it being understood that additional pairs of notches may be incorporated as desired to accommodate different angular positions of the frame 12 to suit the individual.

Obviously, the razor construction disclosed requires a blade substantially complementary in configuration to that of the frame 12. A top plan of such a blade, provided with two cutting edges, is shown per se in Figure 5, and is designated as a whole by numeral 67. A top plan of such a blade, provided with a single cutting edge, is shown per se in Figures 6 and 7, and is designated as whole by numeral 68.

For obvious reasons, the double-edged blade 67 is considered preferable, wherefore its incorporation in the razor assembly 10 has been illustrated in the drawing. And as will appear, said blade 67 may be provided with an additional feature not shown in Figure 5, if desired.

Blade 67 is V-shaped, and includes an arcuate apex portion 70 integral with a left-hand angularly disposed segment 72, and with a similar right-hand segment 74. The blade is inherently resilient and flexible, and it is noted at this time that the angularity normally obtaining between its segments 72 and 74 in relaxed disposition is more acute than that which obtains between the rigid segments 22 and 24 of frame 12.

As seen to best advantage in Figure 5, the marginal edges of apex portion 70 are indented to provide aligned notches 76 dimensioned almost imperceptibly larger than the lugs 40.

Each of the blade segments 72 and 74 has formed therein adjacent the cutting edge thereof, a pair of longitudinally spaced aligned openings 78, slightly larger than and therefore adapted to encompass the ears 30 of frame 12.

It is believed prolix to enter into a detailed description of blade 68 portrayed in Figures 6 and 7. In these views, the portions described in connection with blade 66 are identified by the same reference numerals, as is understood.

As hereinbefore implied, blade 67 (and if desirable, blade 68 also), may have incorporated therein an additional safety feature, not illustrated in Figures 5 or 6, for facilitating the placement and removal of the blade. This feature resides in a pair of elongated ears 80, which as shown, are integrally formed with and pressed outwardly from the angular segments 72 and 74.

The manner in which my invention attains its objectives should be apparent from the following explanation of what will be termed a shaving cycle. A cycle as contemplated herein, includes the steps of first mounting a blade on the frame 12; thereafter swinging said frame about its pivotal mounting to bring a cutting edge of the blade into an effective angular position; then shaving; and finally removing the blade for cleansing and re-use, or for discard purposes.

In effecting the initial step of the cycle, frame 12 is swung into its central or intermediate position, whereby the detents 66 engage the notches 60 to thus releasably lock the frame in that position. Assuming that the razor is held in the left hand, a blade 67, grasped between the thumb and forefinger of the right hand via the projecting ears 80, is deposited onto frame 12 in such fashion that the openings 78 encompass the ears 30, whereby the notches 76 are automatically brought into registry with lugs 40, as should be evident.

As hereinbefore noted, the normal angularity of the blade is more acute than that of frame 12. Therefore, downward pressure now exerted against apex portion 70 will tension the blade segments 72—74 due to increased angularity therebetween, whereby the uppermost edges of the openings 78 readily slide under the ears 30, while the notches 76 simultaneously pass the lugs 40 to bring the apex portion 70 of the blade into intimate contact with the confronting periphery of frame apex segment 20 which is rigid with cylinder 52. It is noted that this entire blade mounting operation may be accomplished in a matter of seconds, and without the least danger of injury.

Attention is directed at this time to the disposition of the arcuate lugs 40 relative to the apex segment 20. In the assembled razor minus a blade, an arcuate space corresponding to the thickness of a blade obtains between the periphery of said segment and the lugs aforesaid, as should be clear from an inspection of Figure 2.

Therefore, after a blade has been mounted, frame 12 may be swung about its pivotal mounting until either of blade segments 72 or 74 is disposed in effective angular cutting position, and locked in such position by the notch and detent means 16.

In other words with reference again to Figure 2 and also to Figure 4, when the razor is ready for use with segment 72 in effective cutting position, detents 66 are engaged in the notches 64; segments of the blade apex portion 70 about notches 76 underlie the lugs 40 as demonstrated in Figure 3; two of the abutments 56 engage against the right hand edges of bracket legs 36 as Figures 2 and 3 demonstrate; and the ears 30 clamp the blade segments against the frame as best seen also in Figure 2.

With such a stabilizing arrangement, it is believed to be manifest that a superlative shave may be had. Any tendency of the blade to shift endwise, to flex or to rise for example, during a shaving operation involving a particularly heavy beard, is obviously obviated by these measures. Should the cutting edge of blade segment 72 become dull, the frame 12 may be swung so as to position segment 74 in effective cutting position, at which time detent 66 will engage notch 62, and so on as is apparent.

The shaving operation is accomplished in the usual manner, the elongated slots 34 being provided in guard portions 32 for facilitating cleansing when necessary.

The final step of the cycle comprises the removal of the blade following the completion of a shaving operation. The simple manner in which this may be accomplished is considered meritorious. With the inverted razor suspended by means of handle 18, it is only necessary to swing frame 12 to its central or intermediate position to effect the first-stage of automatic dislodgment of the blade responsive to release of the blade to assume its normal relaxed disposition with respect to the frame 12, which thereupon may drop off the frame by gravity.

That is to say, with attention once more directed to the more acute angularity normally obtaining between the resilient blade segments 72 and 74 relative to that obtaining between the rigid frame segments 22 and 24, said blade segments have been distended into tensioned con-

dition from their normal relaxed planes during the mounting operation of the cycle. As a result, when frame **12** is swung to its central position whereby the notches **76** are brought into registry with lugs **40**, the blade segments **72** and **74** spring, so to speak, out of engagement with the ears **30** as apex portion **70** springs past said lugs and out of engagement with the cylinder **52**. These concurrently effective resilient forces, augmented by the natural force of gravity, combine to effect the automatic separation of blade **67** from the frame **12**.

With respect to the single-edged blade **68** illustrated in Figures 6 and 7, the initial placement, the subsequent use, and the final removal thereof is believed to be manifest without further elaboration.

In view of the foregoing description augmented by the drawings, it should be evident that my invention discloses a novel razor construction which is safe, simple in design, and which is adapted to achieve its objectives.

Whereas the drawings illustrate, and the above description sets forth the preferred embodiment of my invention, it is to be understood that the invention contemplates any variations of structure, and equivalents or modifications which may fall within the scope of the appended claims.

I claim as my invention:

1. In a razor construction: a handle, a channel shaped bracket, means for attaching said bracket rigidly to one end of said handle, a resilient generally V-shaped blade normally undistended, a generally V-shaped frame pivotally mounted at its apex on said bracket for receiving and supporting said blade in distended status, means for releasably maintaining said frame and the blade supported thereon in a selected operative position of angularity relative to the vertical centerline of said handle, complementary means provided on the blade and on the frame aforesaid for stabilizing said blade during a shaving operation, and means for loosening the blade subsequent to a shaving operation in automatic fashion, said means comprising a pair of integral arcuate lugs projecting inwardly from the apex portion of said bracket, and a pair of notches formed in the apex marginal edges of the blade adapted when brought into registry with said lugs to enable the inherent resiliency of said blade to expand the latter into its normal undistended status.

2. In a razor construction: a handle, a channel shaped bracket, means for attaching said bracket rigidly to one end of said handle, a resilient generally V-shaped blade normally undistended, a frame pivotally mounted at its apex on said bracket for receiving and supporting said blade in distended status, said frame having a generally inverted V-shaped contour, notch and detent means for releasably maintaining said frame and the blade supported thereon in a selected operative position of angularity relative to the vertical centerline of said handle, complementary means provided on the blade and on the frame aforesaid for stabilizing said blade during a shaving operation, and means for loosening the blade subsequent to a shaving operation in automatic fashion, said means comprising a pair of integral arcuate lugs projecting inwardly from the apex portion of said bracket, and a pair of notches formed in the apex marginal edges of the blade adapted when brought into registry with said lugs to enable the inherent resiliency of said blade to expand the latter into its normal undistended status.

3. A razor construction for a V-shaped blade, said construction including: a blade receiving and supporting frame; a channel shaped bracket on which said frame is pivotally mounted for rotary movements; abutment means on the frame for engaging the leg portions of said bracket to limit the rotary movements of the frame; a series of notches in said frame, and a pair of detents provided on said bracket for releasably maintaining the frame in a selected position of rotary movement intermediate the limited positions thereof; a pair of inwardly projecting arcuate lugs on the bracket, and pairs of longitudinally spaced ears on the frame, for releasably retaining a blade in position on the frame during shaving operations; a handle; and means associated with said bracket and with said handle for rigidly attaching the former to one end of the latter.

4. The razor construction of claim 3, wherein the blade receiving and supporting frame is of inverted V-shaped configuration and also includes: a substantially semi-circular apex segment integral with an angularly disposed left-hand and with a similar right-hand segment; integral sector-shaped end walls each having said series of radial notches formed therein along the lower arcuate peripheral margin thereof; and a hollow cylinder secured to said apex segment and extending between the inner faces of said end walls for the pivotal mounting of said frame.

5. The razor construction defined in claim 4, wherein the pivotal mounting for said frame comprises a transverse rod extending through said cylinder and through aligned circular apertures provided in the end walls of said frame and in the upwardly extending leg portions of said bracket, the extremities of said rod being peened over against the outer surfaces of said legs for preventing endwise and rotary movements of the rod.

6. In a razor for use with a blade of the type described: an inverted V-shaped supporting frame for the blade, said frame including sector-shaped end walls; a series of radial notches formed along the lower peripheral edge of each wall; a channel shaped bracket including a web portion and a pair of upwardly extending leg portions; a pivotal mounting for the frame supported between the upper ends of said leg portions; an integral inwardly extruded detent on each leg portion for engaging a selected notch of the series in one of said end walls; and a handle secured centrally to the web portion of said bracket.

7. In a razor for use with a substantially V-shaped blade having resilient divergent leg segments joined by an arcuate apex segment and a pair of longitudinally spaced apertures in said leg segments medially disposed with respect to the blade apex segment and cutting edges thereof: the combination of a generally U-shaped handle mounted bracket, an inverted substantially V-shaped frame for receiving and supporting the blade in distended status thereon; a pivotal mounting about which said frame may be swung relatively to said bracket to bring either one of the two divergent leg segments of said blade into selective shaving positions; a pair of longitudinally spaced and aligned ear elements extruded from the surrounding body portion of the frame and coplanar therewith for engaging said blade apertures to stabilize the said blade during a shaving operation; and notch and cooperating detent means operably incorporated between said frame and bracket for releasably locking the frame and the blade supported thereon in said selective shaving positions of angularity relative to the vertical centerline of the razor.

8. A razor including in assembly: a V-shaped double edged blade; a handle; a channel shaped bracket rigidly mounted on one end of the handle; an inverted V-contoured support for the blade and means for releasably maintaining said blade in position thereon; a hollow cylinder included in the apex portion of said support; a rod supported by said bracket extending through said cylinder for rotatably suspending the frame; and complementary detent and notch means provided respectively on said bracket and said frame for first releasably retaining the frame in position for mounting the blade, and for thereupon releasably retaining the frame in position for disposing the blade in effective shaving angularity.

9. A razor including in assembly: a V-shaped single edged blade; a handle; a channel shaped bracket rigidly mounted on one end of the handle, an inverted V-contoured support for the blade and means for releasably maintaining said blade in position thereon; a hollow cylinder included in the apex portion of said support; a rod supported by said bracket extending through said

cylinder for rotatably suspending the frame; and complementary detent and notch means provided respectively on said bracket and said frame for first releasably retaining the frame in position for mounting the blade, and for thereupon releasably retaining the frame in position for disposing the blade in effective shaving angularity.

10. In a razor for use with a blade of the type described: an inverted V-shaped supporting frame for the blade, said frame including sector-shaped end walls; a series of radially spaced notches formed along the lower curved peripheral edge of each end wall; a channel shaped bracket including a horizontal web portion and a pair of upwardly extending leg portions; a pivotal mounting for supporting the frame between the upper ends of said leg portions; an inwardly extruded detent portion on the lower end of each leg portion for yieldably engaging a selected notch of the series in said end walls; and a handle secured to said bracket medially of said web portion.

11. The razor construction defined in claim 10 in which the upper ends of the leg portions of said bracket are formed to produce integral confronting horizontal portions superjacent the extremities of the pivotal mounting for the frame and blade supported thereby, said portions being registrable with correspondingly spaced notches in the blade when said frame is in one of its selected positions to accommodate loading and unloading of the blade, and effective in disaligned relationship to lock the blade on the supporting frame when the latter is in another selected position.

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