

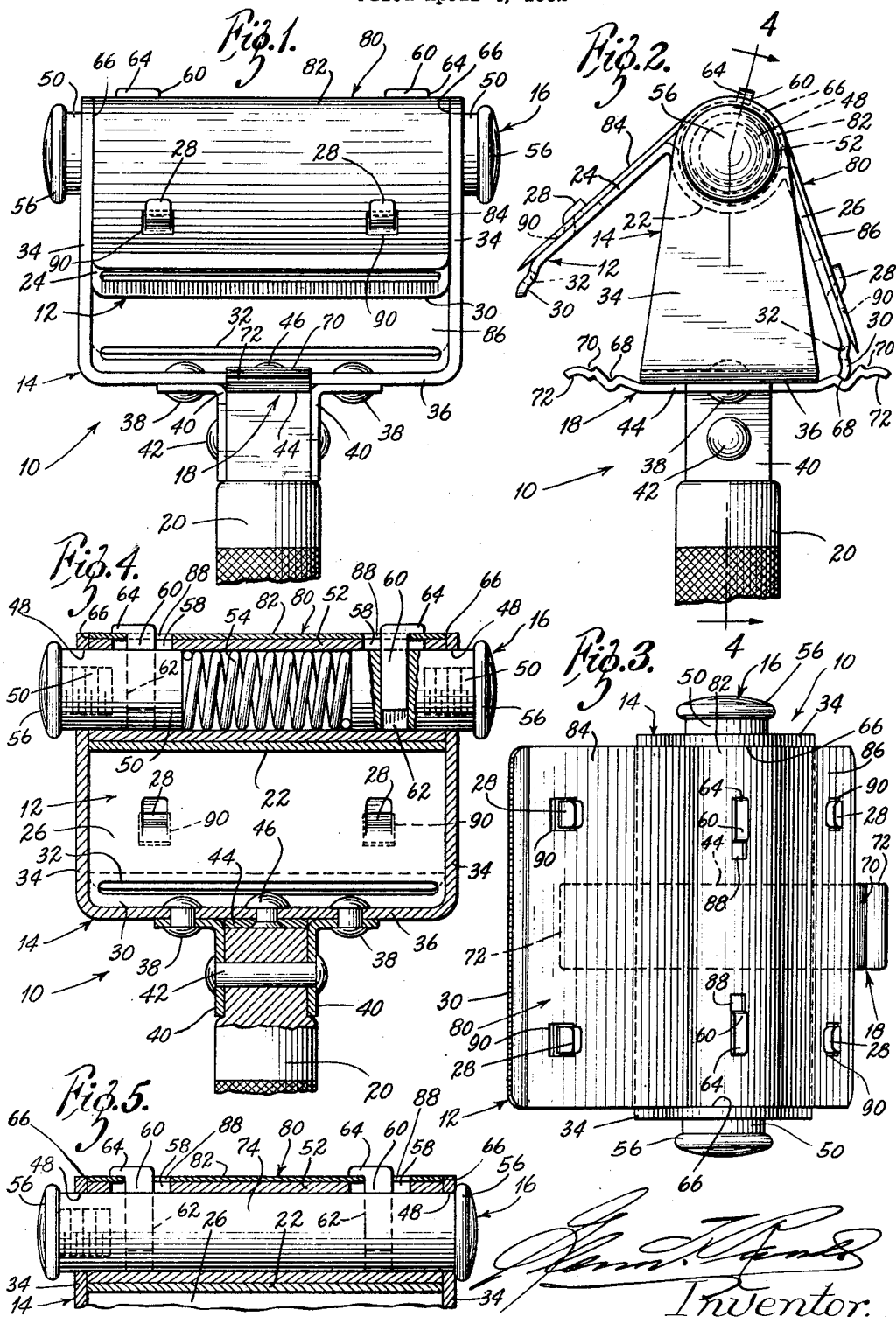
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G. T. RANDOL

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SAFETY RAZOR

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Inventor.

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SAFETY RAZOR

Glenn T. Randol, Mountain Lake Park, Md.

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The present invention relates to a novel safety razor construction which incorporates means whereby an expendable, generally V-shaped blade with two cutting edges, may be quickly and easily positioned, adjusted for use, cleaned at intervals during use, and finally removed.

Considerable attention has been focused on the personal injury factor incident to the placement and subsequent removal of conventional two-edged blades, not only by those engaged in the manufacture of razors, but also by others.

However, insofar as I am aware, the only practical solutions heretofore evolved require the use of an accessory, such as a loading device or the like, for positioning the blade, but subsequent removal of the latter is still fraught with the risk of personal injury.

The present invention has for its primary object the provision of a safety razor which warrants the "safety" appellation not only during a shaving operation, but also prior to, and subsequent to such an operation.

To this end, the invention provides a pivotally mounted frame having a generally inverted V-shaped contour and adapted to receive and support a V-shaped blade; means associated with said frame for releasably clamping the blade thereon; means for engaging a free end of said frame to releasably retain the blade in a selected position of angularity relative to the vertical centerline of the razor handle; means for stabilizing said blade during shaving operations; and means for disengaging the clamping means aforesaid whereby to automatically loosen the blade, so that with the razor held in inverted fashion, said blade may drop therefrom under the influence of gravity, as will appear.

Objects, features, and advantages not specifically referred to above, will be apparent or pointed out in the detailed description of the invention to follow, reference being had also to the accompanying drawing, wherein the invention is 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 embodying the principles of the present invention;

Figure 2 is a right end elevational view thereof;

Figure 3 is a top plan view thereof;

Figure 4 is a longitudinal sectional view taken approximately along the line 4—4 in Figure 2; and

Figure 5 is a fragmentary view similar to Figure 4, illustrating a slight modification.

Referring to the drawings:

The razor construction comprising the invention is indicated generally in Figures 1 through 4, by the reference numeral 10. Broadly, the structure includes a blade supporting frame designated 12; a channel shaped bracket 14 on which said frame is pivotally mounted; a manually-operable assembly 16 for releasably retaining said blade in position on the supporting frame; a transversely disposed resilient plate member 18 for releasably maintaining said frame and the blade supported thereon

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in a selected operative position of angularity relative to the vertical centerline of the razor; a handle 20, and means associated therewith for mounting the designated structure on the upper end portion of said handle.

Viewed endwise, as in Figure 2, the blade supporting frame 12 may be said to be of inverted V-shaped configuration, including a substantially semi-circular concave apex segment 22 integral with an angularly disposed left-hand segment 24, and with a similar right-hand segment 26.

As portrayed particularly in Figures 1 and 3, each of the angularly disposed segments 24 and 26 of said frame is provided with a pair of longitudinally spaced and aligned ears 28 pressed outwardly from the surrounding body portion of the segment and co-planar therewith. Each of said segments also terminates in a guard portion 30 of the configuration shown, and having an elongated slot 32 formed therein.

The bracket 14 includes a pair of upwardly extending leg portions 34 joined by a web portion 36. Rivets 38, passing through aligned apertures in web portion 36 and angle plates 40, in conjunction with a rivet 42 passing through aligned apertures in the upper end of handle 20 and plates 40, serve to rigidly mount the bracket 14 on said handle, as Figure 4 clearly demonstrates.

It is noted that the disposition of said angle plates relative to the top surface of the handle is such as to provide a rectangular opening through which the central body portion 44 of the resilient member 18 extends. The latter is secured to the web portion 36 centrally thereof by means of a rivet 46 as shown, or otherwise.

Each of the legs 34 has formed therein, adjacent the upper end thereof, a circular opening 48 for the reception of a pair of plunger members 50 which, in addition to other functions to appear, pivotally support the end sections of a cylindrical sleeve 52 coaxially disposed with respect to said members and extending between the inner faces of said legs.

As shown in the drawings, the plungers 50 are normally biased outwardly by a preloaded compression spring 54 interposed in said sleeve between their inner ends, and the outer projecting end of each plunger terminates in an enlarged finger piece or knob 56. As best seen in Figures 2 and 4, the lower half of sleeve 52 is seated in the concave apex 22 of the frame 12, and is welded or otherwise rigidly secured thereto, so that hereinafter said sleeve will be considered to be an integral part of said frame as the preferred construction.

Formed in the top periphery of sleeve 52, are two rectangular elongated slots 58 in longitudinally spaced relation, each being adjacent respective ends of said sleeve. Projecting through each of said slots is the free upper end of a lug 60, the lower end of which is pressfitted into a non-circular opening 62, one such opening being provided in each plunger 50. Each lug 60 terminates at the top in an outwardly projecting finger 64, integral with and formed normal to the body portion of said lug, as clearly illustrated in Figure 4. This view also shows that the sleeve 52 is so positioned as to provide an arcuate abutment surface 66 along the upper extremity of each leg 34. For clarification, reference to Figure 2 is invited.

The element 18 is of spring metal, and of the configuration exhibited in Figures 2 and 3. The illustrated plate 18 includes a first catch or detent 68, and a second detent 70 in each of its laterally projecting free segments 72. However, in actual practice, the invention contemplates the provision of an additional detent if desirable, as is understood.

The slightly modified form of the invention portrayed fragmentarily in Figure 5 is similar in all respects to the preferred form with these exceptions: compression spring

54 is dispensed with, and a single reciprocable plunger 74 is substituted for the pair of plungers 50. The other elements which appear have been described hereinbefore, and are designated by the same reference numerals employed in that description, it being noted that both fingers 64 of lugs 60 are similarly disposed.

Obviously, the razor construction illustrated and described requires a blade substantially complementary in configuration to that of the supporting frame 12. Such a blade is generally designated by the numeral 80. It is V-shaped as shown, and includes an arcuate apex portion 82 integral with a left-hand angularly disposed segment 84, and with a similar right-hand segment 86.

It is noted at this time that the blade 80 is inherently resilient and flexible, and further that the angle normally obtaining between the segments 84 and 86 thereof is more acute than that which obtains between the rigid segments 24 and 26 of the blade supporting frame 12.

With particular reference to Figure 3, it is seen that the blade 80 has six rectangular openings formed therein. These include two elongated slots 88 provided in the arcuate apex portion 82 in longitudinally spaced relation, and a pair of openings 90, slightly larger than and therefore adapted to encompass the ears 28, provided in each of the blade segments 84 and 86.

Although attainment of the various objectives of the invention should be manifest from the preceding description and an inspection of the drawing, an explanation of what will be termed a shaving cycle will be given. A cycle, as contemplated herein, includes the steps of first mounting a blade 80 on the frame 12; thereafter swinging said frame about its pivotal mounting to provide the desired blade effective cutting angularity; then shaving; and finally, removing the blade for cleansing and re-use, or for discard purposes.

In effecting the first step of the cycle, a blade 80, with the marginal edges of its apex portion 82 held between the thumb and fore-finger of the right hand, is deposited onto frame 12 in such fashion that the openings 90 encompass the ears 28, whereby the elongated slots 88 are automatically brought into alignment with the slots 53 of sleeve 52. Inward manual pressure simultaneously applied to the plungers 50 by the thumb and fore-finger of the left hand, serves to position the lugs 60 immediately below, and in registration with said slots 88.

It will be remembered that the angularity of the blade is normally more acute than that of the frame 12, so that downward manual pressure now exerted against the apex 82 will cause the uppermost edges of the openings 90 to slide under the ears 28, as is understood. Simultaneously, this downward pressure causes the apex portion 82 to engage against the periphery of sleeve 52, elongated slots 88 accommodating the lugs 60 which now have their upper ends projecting through said slots. Upon withdrawal of thumb and finger pressure from plungers 50, compression spring 54 automatically spreads said plungers, whereby the fingers 64 of lugs 60 move outwardly into the blade clamping position most clearly exhibited in Figure 4.

This entire blade mounting operation may be easily accomplished in a matter of seconds, and without the least danger of injury. It should be obvious that when in position, the blade is stabilized on the frame for a smooth and efficient shaving operation. Any tendency of the segments 84 or 86 to flex or to rise from the frame, for example during a shaving operation involving a heavy beard, is obviated by the ears 28. Any endwise movement of the blade which may develop is minimized by the provision of the arcuate abutment surfaces 66.

After the blade has been mounted, the frame may be swung about its pivotal mounting to dispose the selected cutting edge in the desired position of angularity, in which position it is maintained by one of the detents 68 or 70 provided in the resilient plate 18. The manner in which this is accomplished should be manifest from an inspection of Figure 2, without requiring any further explanation.

Assuming that the razor is in the condition shown in Figure 2, shaving is accomplished in the usual manner. The disposition of the elongated slot in guard portion 30 is such that cleansing is facilitated. Should the cutting edge of blade segment 84 become dull, the frame 12 may be swung so as to bring the segment 86 into effective cutting position, as is understood.

Following completion of the shaving operation, removal of the blade 80 completes a cycle. The simple manner in which blade removal may be accomplished without manual contact being had with the blade, constitutes one of the noteworthy features of the present invention.

That is to say, with the left hand suspending the inverted razor by means of handle 20, it is only necessary to apply inward pressure to the plungers 50 with the right hand to effect the automatic dislodgment of the blade 80, which thereupon drops off frame 12 by gravity. This automatic removal of the blade is inaugurated responsive to manual operation of the plunger members 50 or modified plunger 74 (see Figure 5), whereby the deformed tensioned disposition of the blade in shaving position is released to assume its normal free angularity.

In other words, with attention once again directed to the more acute angularity normally obtaining between the resilient blade segments 84 and 86 relative to that obtaining between frame segments 24 and 26, said blade segments have been distended into tensioned condition from their normal relaxed planes during the mounting operation hereinbefore described. Consequently, when the plungers 50 are pressed inwardly with the razor inverted, the clamping fingers 64 are retracted, so that the blade 80 will automatically revert to its normal configuration. In so doing, blade segments 84 and 86 simultaneously spring, so to speak, out of engagement with the ears 28 as apex portion 82 springs out of engagement with sleeve 52. These concurrently effective resilient forces, augmented by the natural force of gravity, combine to separate the blade 80 from the frame 12 automatically.

As hereinbefore indicated, the modification illustrated in Figure 5 dispenses with the compression spring 54, and the lugs 60 are imbedded in a single plunger member 74. Manual pressure applied to move said plunger in one direction will clamp the blade 80 in position, whereas similar pressure applied to said plunger in the opposite direction will release the blade.

In view of the foregoing, it should be evident that my invention discloses a novel razor construction adapted to efficiently achieve its objectives. It should also be evident that the illustrated and described embodiments of the invention may be modified without departing from the principles and scope of the invention as defined in the appended claims.

I claim as my invention:

1. A razor construction including in combination: a handle; a bracket rigid with one end of the handle, a frame of generally inverted V-shaped contour pivotally mounted on said bracket for supporting a similarly contoured blade, the apex portion of said frame and of said blade having an arcuate contour; means associated with the frame for clamping the apex portion of said blade onto the apex portion of the frame; means for engaging a free end of said frame to releasably maintain said blade in a selected operative position of angularity relative to the vertical centerline of said handle; means integrally formed on said frame for engaging divergent portions of said blade to stabilize the latter during a shaving operation; and manually operable means for disengaging the clamping means aforesaid following a shaving operation whereby to automatically loosen said blade for easy removal thereof from the frame.

2. A razor construction for a V-shaped blade comprising: a blade supporting frame; a channel shaped bracket on which said frame is pivotally mounted; a manually operable assembly associated with said frame for releasably retaining said blade in position thereon;

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a transversely disposed resilient plate member for releasably maintaining said frame and the blade supported thereon in a selected operative position of angularity relative to the vertical centerline of the razor; a handle; and means associated with the handle for mounting on one end thereof the bracket and resilient plate aforesaid.

3. The razor construction of claim 2, wherein the blade supporting frame is of inverted V-shaped configuration and includes: a substantially semi-circular concave apex segment integral with an angularly disposed left-hand and with a similar right-hand segment; a pair of longitudinally spaced and aligned ears pressed outwardly from and co-planar with the surrounding body portion of each angular segment; a guard constituting the free marginal portion of each angular segment; an elongated slot formed in each guard portion; a cylindrical sleeve the lower half of which is seated in and permanently secured to said concave apex segment; and an elongated rectangular slot formed in the top periphery of said sleeve adjacent each end thereof.

4. The razor construction of claim 2, wherein the blade supporting frame includes a cylindrical sleeve; and wherein the means for pivotally mounting said frame on the said channel shaped bracket includes a circular opening adjacent the upper end thereof formed in each of the upwardly extending leg portions of said bracket, said openings being in alignment, and a pair of headed plunger members each extending through one of said openings and into one end portion of said sleeve.

5. The razor construction of claim 2 wherein the blade supporting frame includes a cylindrical sleeve provided with an elongated slot in the top periphery adjacent each end thereof; and wherein the assembly for releasably retaining a V-shaped blade in position on said frame includes: a pair of oppositely disposed plunger members each extending into one end of said sleeve; an unsecured compression spring interposed in said sleeve between the inner faces of said plungers for normally biasing them outwardly; a lug the upper end of which projects through one of said slots, and the body portion of which is pressfitted into a non-circular opening provided in each of said plungers; an outwardly projecting finger integral with the upper end and normal to the body portion of each lug; and an enlarged head provided on the outer end of each plunger, whereby application of manual pressure will move said plungers inwardly to effect the registration of the upper ends of said lugs with rectangular slots provided in said blade, and whereby upon subsequent release of pressure, said compression spring will move said plungers outwardly to effect the engagement of said fingers against the top surfaces of said blade about said slots.

6. The razor construction of claim 2, wherein the transversely disposed member for releasably maintaining said frame and the blade supported thereon in a selected position of angularity comprises: a plate of spring metal including a main body portion rigidly secured centrally thereof to said channel shaped bracket whereon said frame is pivotally mounted, a pair of free segments integral with and extending laterally from said body portion in opposite directions, and a plurality of detents formed in each segment for engaging one free marginal edge portion of said frame.

7. In a razor for use with a double-edged blade having a pair of spaced apertures in an arcuate apex segment integral with resilient diverging angular segments: the combination with said blade of a pivoted frame for supporting the blade during a shaving operation, said frame being of inverted V-shaped contour and including an arcuate apex portion and rigid diverging angular portions, the normal angle obtaining between the resilient diverging segments of said blade being slightly more acute than that obtaining between the rigid diverging portions of said frame, and manually-operable clamping means disposed coaxially with respect to the axis of

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said frame apex portion for projection through said blade apertures when operated into registry therewith and operable relatively in a different direction with respect to said apertures into engagement with the outer surface of the blade apex segment to clamp the blade in effective shaving position on said frame.

8. In a razor for mounting a blade of the character described: an inverted V-shaped frame including an apex portion and two diverging portions integral therewith; a pivotal mounting for the frame; a pair of manually operable plunger and lug assemblies reciprocally mounted in the apex portion of said frame including an unsecured compression spring interposed between said plungers for releasably clamping the apex segment of said blade to the similar portion of said frame; and cooperating ears struck from the divergent portions of said frame for releasably engaging the similar segments of said blade.

9. A razor including in assembly: a V-shaped double-edged blade; a handle; a channel shaped bracket mounted on one end of the handle; an inverted V-contoured support for the blade; a cylindrical sleeve forming the apex portion of said support; a pair of plunger members extending through aligned circular openings in the upwardly extending leg portions of said bracket and into the ends of said sleeve; an unsecured compression spring interposed in said sleeve between the opposing inner ends of said plungers; an elongated slot formed in the upper periphery of the sleeve adjacent each end thereof; a lug rigid with each plunger and having its upper end projecting through one of said slots; an outwardly projecting finger integral with the upper end of each lug; a finger-piece on the outer end of each plunger; a plate of spring metal secured to the web portion of said channel bracket, the end portions of said plate projecting laterally therebeyond; and a series of detents formed in each of said end portions.

10. The razor construction of claim 2, wherein the blade supporting frame includes a cylindrical sleeve; and wherein the means for pivotally mounting said frame on the said channel shaped bracket includes a circular opening adjacent the upper end thereof formed in each of the upwardly extending leg portions of said bracket, said openings being in alignment; and a headed plunger member extending through each of said openings and through said sleeve.

11. The razor construction of claim 2, wherein the blade supporting frame includes a cylindrical sleeve provided with an elongated slot in the top periphery adjacent each end thereof; and wherein the assembly for releasably retaining a V-shaped blade in position on said frame includes: a reciprocable plunger extending through said sleeve; a pair of lugs the upper ends of which each project through one of said slots and the body portions of which are pressfitted into non-circular openings provided in said plunger; a laterally projecting finger integral with the upper end and normal to the body portion of each lug; and an enlarged head provided on each end of said plunger, whereby the application of manual pressure to one of said heads will move said plunger in one direction to effect the registration of the upper ends of said lugs with rectangular slots provided in said blade, and whereby the subsequent application of manual pressure to the other head will move said plunger in the opposite direction to effect the engagement of said fingers against the top surfaces of said blade about said slots.

12. The razor construction of claim 7 in which said manually-operable clamping means comprise two slidable elements spring-pressed apart, each element carrying a lateral extension adapted to project through said blade apertures when said elements are predeterminedly operated toward each other, and effective to clamp said blade in the manner described when said elements are spring-pressed apart relatively to said apertures.

13. The razor construction of claim 7 in which said manually-operable clamping means comprises a single

slidable element having a pair of spaced lateral extensions adapted to project through said blade apertures when predeterminately operated in one direction, and effective to clamp said blade in the manner described when said element is operated in the opposite direction relatively to said apertures. 5

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