Dec. 11, 1962 G. T. RANDOL 3,067,512

SAFETY RAZOR WITH GUARD MEANS RELEASABLE FOR BLADE WASHING AND CHANGING

Original Filed March 19, 1957 2 Sheets-Sheet 1

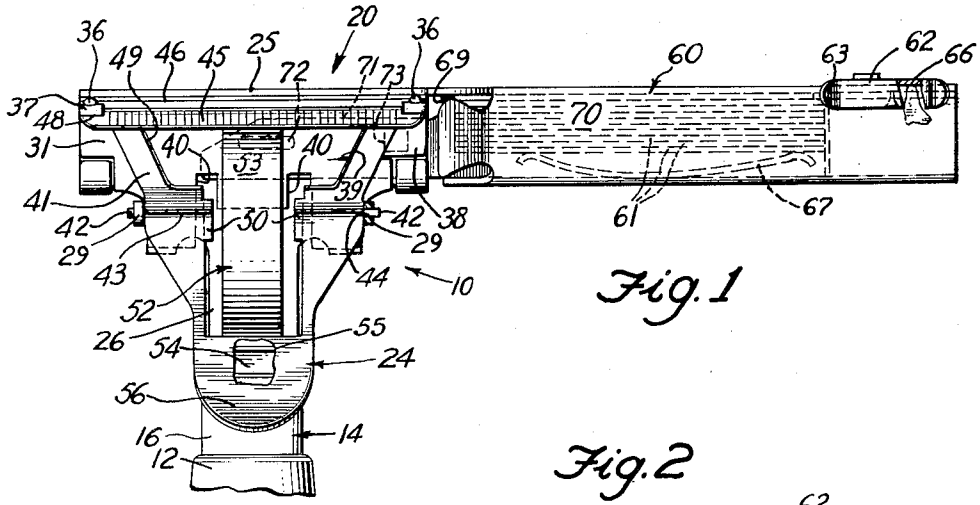


Fig. 1

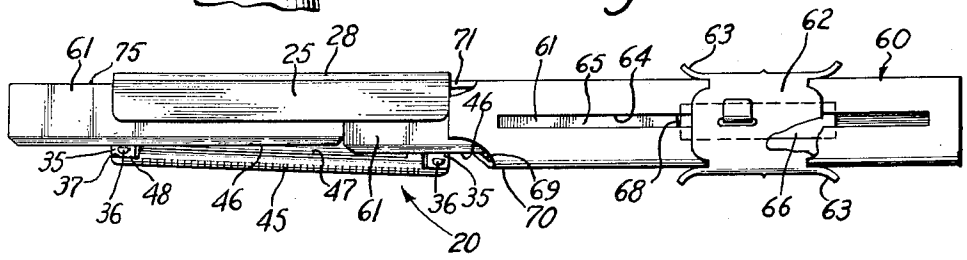


Fig. 2

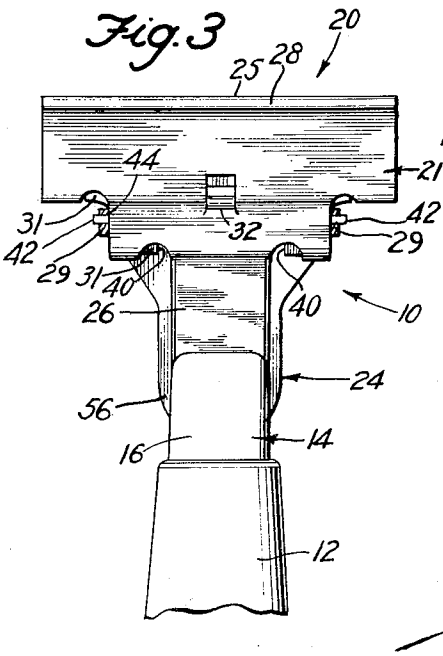


Fig. 3

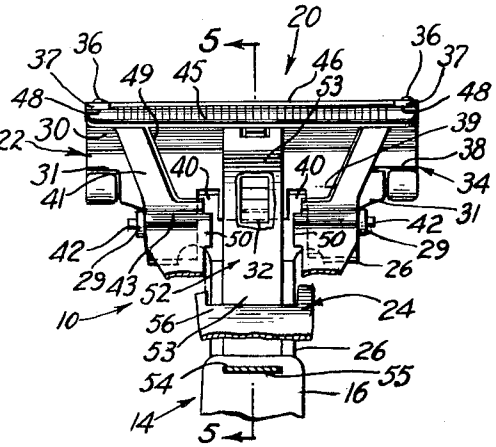


Fig. 4

Inventor

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SAFETY RAZOR WITH GUARD MEANS RELEASABLE FOR BLADE WASHING AND CHANGING

Original Filed March 19, 1957 2 Sheets-Sheet 2

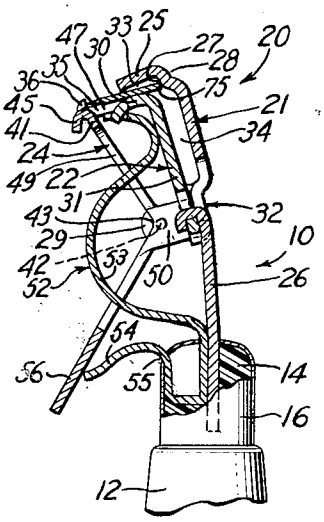


Fig. 5

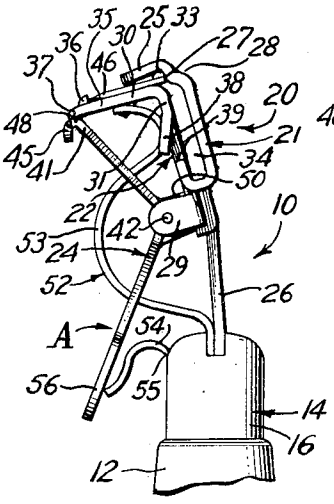


Fig. 6

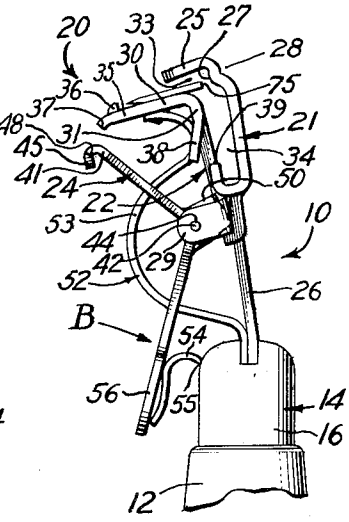


Fig. 7

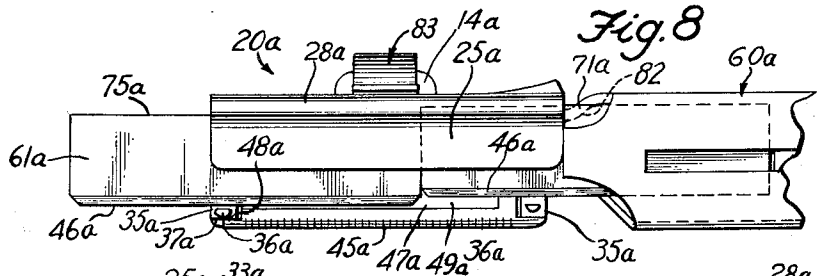


Fig. 8

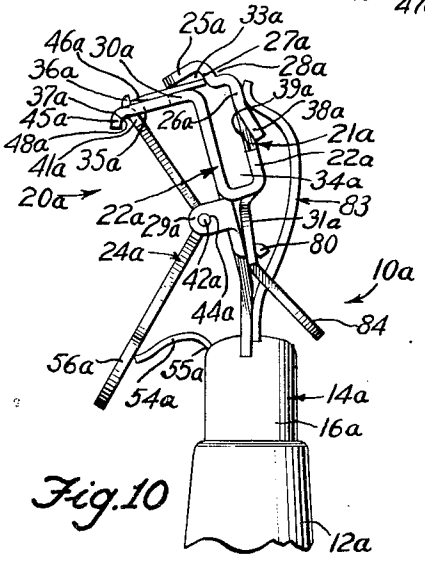


Fig. 10

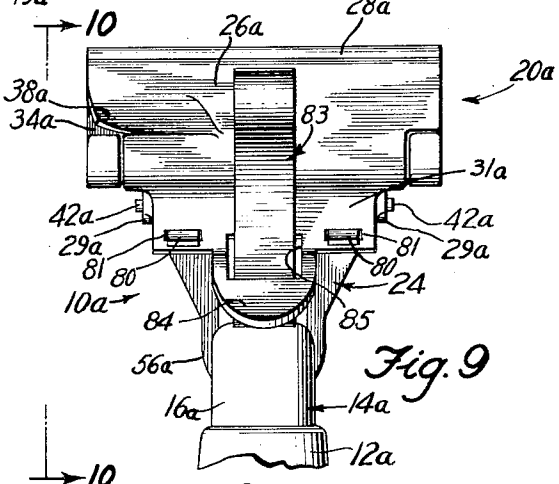


Fig. 9

Inventor

United States Patent Office 3,067,512 Patented Dec. 11, 1962

3,067,512

SAFETY RAZOR WITH GUARD MEANS RELEASABLE FOR BLADE WASHING AND CHANGING

Glenn T. Randol, 2nd Ave. & Paull St., Box 275, Mountain Lake Park, Md.

Continuation of application Ser. No. 647,078, Mar. 19, 1957. This application May 2, 1960, Ser. No. 26,929
5 Claims. (Cl. 30—62)

The present invention relates generally to safety razors providing manual blade-changing, and more particularly to the type utilizing a manually-operated blade loading device for forcibly effecting blade-changing of an expandable blade comprising a single cutting edge opposite a butt edge, with both insertion and ejection of the blade taking place parallelly with respect to the razor-cutting components. This application is a continuation of my prior copending application Serial No. 647,078 filed March 19, 1957, now abandoned.

In the art of safet razors, the problems of washing the blade cutting components free of lather to prevent clogging, as by water flow during a shaving operation, and also of providing for drying of the cutting edge for subsequent use, without removing the blade from the razor until a blade-change is required, have received considerable attention. For example, various types of razors have been proposed with blade holders movable relatively to the cutting edge guard freeing, or by freeing the blade of clamping action, others necessitating the cost of a new blade for each shave, while others incorporate a cutting edge guard rigid with the blade platform and having intricate openings which attempt to clear the beard-ladened lather from the cutting edge; but none which would enable instant cleaning of the cutting edge and razor head during a shaving operation while the blade remains clamped by exposing the cutting edge unguarded, with the added advantage of preserving the cutting edge for subsequent use as by thoroughly drying the same upon completion of a shave.

The present invention has for a primary object, advancement of the art by providing a razor of the last-mentioned type for use with blades of the character above set forth, and which accommodates efficient cleaning at will of the interior of the razor head and the cutting edge of the blade while the latter is clamped in shaving position, said razor comprising a pair of blade clamping members with novel cutting edge guard means movable relatively thereto from normal "safety" position wherein the cutting edge is guarded, to two successive operating positions; namely, an intermediate and an extreme position, wherein the cutting edge is exposed unguarded to facilitate blade cleansing without disturbing the clamped disposition of the blade between said clamping members, said extreme position providing for individual blade-changing directly by hand.

More specifically, the present invention provides a razor having a blade platform with a pivotally mounted spring-loaded clamping member for releasably retaining a blade therebetween, said platform and member being arranged such that either may be connected to the handle whereby the clamping member may be disposed superjacently with respect to the platform fixed to the handle, or subjacently to form the platform with respect to the other member fixed on the handle.

Another important object related to the object next above is the provision of a razor having its blade cutting edge stops in spaced longitudinal disposition on the member forming the blade platform whether or not such member constitutes the movable clamping member or the member fixed on the handle.

A further salient feature of my invention related to the

two objects immediately preceding is the provision of a novel guard member normal spanning the stops aforesaid, a normally preloaded spring for biasing said guard member into its normal shaving disposition, and a manually movable element operably associated with the guard member for retracting it from its normal disposition to expose the blade cutting edge unguarded whereby cleaning of the cutting edge and adjacent surfaces is accommodated without interrupting the clamped status of the blade, said guard member being further provided with integral aligned elements projecting from each end subjacent to the cutting edge of the blade for engaging cooperating abutments carried by the blade platform or frame to establish the guard in shaving relation aforesaid to the cutting edge of the blade.

A further more specific object of the present invention is to provide a separate razor and a separate blade magazine or loading device which however, having coacting parts for not only positioning the parts for the loading operation but which parts have an additional function in enlarging the blade channel formed between the platform and clamping member of the razor to enable a blade to be easily and smoothly fed into the razor channel aforesaid from the magazine and at the same time insuring that the cutting edge of the blade will move free of the blade retaining stops carried by the members aforesaid. Thus, eliminating any chance of the blade cutting edge coming in contact with anything until it is fully within the razor head in readiness to be impinged between the stops in shaving position.

The razor to carry out the object next above of the invention cooperates with the positioning of the blade magazine in being spread for the reception of the blade therefrom, and also functions, when the magazine is withdrawn, by moving the blade automatically from its deposited position from the magazine into a firm position for shaving.

An object importantly related to the two objects immediately above is the novel association of the guard member aforesaid with the cutting edge of the blade and associated stops to enable cleaning the cutting edge during a shaving operation without releasing the blade or removing it from the razor, and the further advantage of drying the cutting edge for subsequent use of the same blade until a blade-change is required.

Another object of importance is the provision of a safety razor of the type under consideration which enables insertion and removal of blades successively either automatically with a magazine or directly by hand, whereby conventional single edge blades of all type sold either in dispensers or packages, or loading magazines may be used by conforming the width of the blade channel to accommodate the narrow or wide blade, the latter type having a reinforcing strip of metal on the butt edge to facilitate handling.

A further object of the present invention is to produce a razor of the type under consideration, in which, the spring action on the manually-retractable guard assembly supplements the spring action of the shaving head members to clamp a blade in shaving position.

The present invention, therefore, facilitates blade insertion, removal, and cleaning while minimizing the risk of personal injury attendant thereto.

Other important objects and advantages of the present invention will be apparent to one skilled in the art from the following detailed description considered in conjunction with the accompanying two sheets of drawings, in which:

FIGURE 1 is a front elevational view of a razor embodying the present invention with the blade magazine attached;

FIGURE 2 is a top plan view showing the magazine

attached to the razor and a blade-changing operation in progress;

FIGURE 3 is a fragmentary elevational rear view opposite the razor-cutting components with a blade in shaving position and the magazine detached;

FIGURE 4 is a fragmentary elevational front view of the razor showing the blade-cutting components and movable guard member associated therewith;

FIGURE 5 is a transverse sectional view, partly in elevation, of the razor head taken on the line 5—5 of FIGURE 4 looking in the direction of the arrows and showing details of the blade channel entrance and associated magazine positioning slot;

FIGURES 6 and 7 are elevational end views showing the blade guard moved to cleaning position and direct manual blade changing position, respectively;

FIGURE 8 is a modified construction of the present invention having the movable clamping member mounted superjacently with respect to the blade platform fixed on the handle;

FIGURE 9 is an elevational rear view of the head portion of the razor of FIGURE 8 opposite the razor-cutting components, showing the mounting of the movable clamping member; and

FIGURE 10 is an elevational end view of the razor of FIGURE 8 taken from the line 10—10 of FIGURE 9 looking in the direction of the arrows and showing details of the blade channel entrance and associated magazine positioning slot.

In the several views identical parts or elements are designated by like reference characters, with corresponding parts or elements of the FIGURE 8 modification distinguished, however, by the addition of the letter "*a*" to each.

Referring now to the drawings, the presently preferred embodiment of my invention is the razor illustrated in FIGURES 1 through 7 and generally designated **10**. The lower end of the razor handle **12** is broken away to conserve space, the upper end section of said handle being designated **14** and is encased by a press-fitted metal sleeve or band **16** for purposes which will become apparent.

The razor head or frame designated **20** comprises in general a pair of inter-fitting clamping members of substantially inverted V-shape cross section designated **21** and **22** respectively, and a movable guard member **24** operably associated with said pair of members for novel purposes hereinafter to become apparent.

Inter-fitting member **21** comprises a top plate **25** with an angular (normally depending) supporting extension **26** mounted rigid with the upper section of the handle by the sleeve **16**, and an inwardly extruded longitudinal blade abutment or stop **27** forming substantially an apex portion **28**.

Inter-fitting member **22** comprises a blade platform **30** provided with an angular (normally depending) supporting extension **31** pivoted at **32**, as by the illustrated centrally disposed downturned lug extruded forwardly from extension **26** and projecting through an aperture in extension **31**, in confronting relation to the member **21** to form a blade channel **33** between the top plate **25** and platform **30** with the supporting extension **31** spaced from the extension **26**, such space being shown at **34**, a pair of longitudinally spaced forwardly extending end brackets **29** on the extension **31**, a pair of longitudinally spaced forwardly disposed segments or arms **35**, each having an upstanding stop or lug **36**, abutment portions **37** formed on said segments in opposite disposition to the stops aforesaid, an extruded wall portion **38** of the extension **31** to form an inwardly tapering surface within the space **34** from the blade entering end of the razor head and a longitudinal wall ledge **39**, and a pair of longitudinally spaced centrally disposed openings **40** in the extension **31** for purposes as will appear.

The movable guard assembly **24** comprises a substantially V-shaped member formed, for example, from a single piece of sheet metal with an upper guard segment **41** provided with a pintle **42** extending from each end thereof coaxially disposed with respect to a longitudinal apex portion **43**, said pintles being adapted to project through circular apertures **44** formed in the brackets **29** to support the guard assembly on the extension **31** for limited rotatable movement relatively to said inter-fitting members **21** and **22**, said guard segment **31** having a downturned longitudinal end guard flange **45** subjacently positioned in spaced relation with respect to the blade cutting edge **46** and adapted to span the space between the pair of forward stops aforesaid without closing the space between the segments **35**, thereby providing a longitudinal opening **47** between the guard end flange and platform slightly to the rear of the blade cutting edge to prevent "clogging" as is understood, each end of the guard end flange having shouldered projections **48** for engagement with the abutment portions **37** to establish the flange in shaving position with respect to the cutting edge of the blade, said abutting portions when engaged and the space normally obtaining between the guard assembly **24** and handle sleeve **16** define the limits of said relative rotation of said guard assembly, and an opening **49** of triangular configuration terminating in a rectangular opening below the apex portion, is provided in the medial portion of the guard member and which intersects an apex portion **43** thereof for a purpose which will become apparent. The guard member **41** also carries a pair of longitudinally spaced camming elements **50** projecting rearwardly from the confronting side marginal edges of the rectangular portion of the opening **49** and subjacent to the apex **43**, for operative engagement with the inner wall surface of the extension **26** to separate the extensions thereby enlarging the blade channel **33** for reception and removal of blades successively directly with the hand.

The pair of inter-fitting members **21**, **22** is biased into inter-fitting blade clamping relationship by means of normally preloaded leaf spring means **52** medially anchored the handle between the upper section **14** thereof and the sleeve **16**, the upper arcuate leg **53** projecting through opening **49** as shown in FIGURE 5 reacts between the clamping members **21**, **22** to resiliently bias the same into normal position wherein a blade is held in shaving position therebetween, and the lower portion of said leg being U-shaped as related to a straight lower terminating extension which lies juxtaposed with respect to the lower end of said support extension **26** fixedly mounted in the upper section **14** of the razor handle; and another normally preloaded leaf spring **54** projects upwardly through a transverse anchor slot **55** in the handle sleeve **16** for one end of the latter spring to form a downturned arcuate configuration to present its free end in continuous engagement with the guard assembly **24** to urge the latter toward normal shaving position in which the cutting edge **46** of the blade is guarded as best illustrated in FIGURES 1, 4 and 5. As previously explained, the guard assembly **24** is characterized by limited relative oscillatory movement with respect to the blade platform, said limits being defined by the abutting portions **37**, **48** in engaging relation to condition the razor for a shaving operation, and the lower underside of the guard assembly, below its pivotal mounting, when fully retracted in opposition to said spring **54** to deform the latter into engaging contact with the handle sleeve **16** provides a "stop means" to establish the guard assembly in such fully retracted position wherein the cutting edge **46** is unguarded as best demonstrated when the guard assembly is full retracted below the position shown in FIGURE 7. The upper arcuate leg **53** is freely accommodated by the opening **49** in the guard member **41** to prevent interfering with the action of said spring means and operation of the guard member best demonstrated in FIGURE 5.

The spring **54** of the spring means is disposed in opera-

tive engagement with the confronting side of an angular projection or finger tab or piece **56** preferably integral with the guard segment **41** at the apex **43** as shown in FIGURES 4 and 5, whereby manual pressure thereon is effective to rotate the guard assembly **24** counterclockwise as viewed in FIGURE 5 to position A of FIGURE 6 to withdraw the end flange **45** from the cutting edge of the blade while in shaving position to facilitate cleaning and drying as will appear.

A blade magazine **60** of conventional design is shown in FIGURES 1 and 2. This magazine, as is understood, is adaptable to hold a supply or stack of blades irrespective of their width, individually designated **61** and is equipped with manual means for forcing the blades successively out of the magazine into the blade channel of the razor. The feeding of the blades is, of course, in succession whereby the blades can be projected, one at a time, from the magazine with simultaneous ejection of the used blade from the razor shaving head.

The manual ejecting means aforesaid comprises a plunger **62** having a finger piece **63** for sliding it back and forth on a track **64** provided by confronting longitudinal marginal edges of an opening **65** through the upper or top wall, the plunger having opposed slots **66** for reception of said marginal edge wall portions whereby transverse displacement of the plunger is prevented. A normally preloaded leaf spring **67** of substantially U-shape configuration is provided with the legs disposed between the pack of blades and inner surface of the lower or bottom wall for continually urging the stack of blades to the top of the magazine. The plunger **62** can be withdrawn to a point where its inclined front edge **68** is disposed behind the ends of the blades in non-parallel relation with respect there to for a purpose to become apparent. This enables the leaf spring **67** to push the stack of blades up against the top of the magazine so that the top blade is presented in the path of the fully retracted plunger **62** (see FIGURE 1) for ejection into the blade channel **33** when the plunger is manually slid toward the shaving head as is understood. The magazine has a slot forming a blade outlet **69** in line with the top blade of the stack and wider than the blades in order that each blade, when ejected, will have its cutting edge clear of the front end **70** of the blade outlet. This insures the cutting edge of the blade against contact with the slot end wall and thus protects its keen edge during blade changes.

The magazine and razor head have coacting means for positioning these two devices in proper registry for feeding a blade from the magazine into the shaving head of the razor. The means aforesaid for this purpose comprise a projection or finger **71** extending as a continuation of the rearward magazine wall best shown in FIGURES 1 and 2. This projection is adapted to cooperate with the inter-fitting members **21, 22** by wedging engagement in the space **34** between the supporting extensions **26, 31** respectively of the shaving head **20**. The finger **71** is shown flat to provide a wide bearing surface in the razor head.

The positioning means has an additional function in spreading the shaving head **20** to enlarge the blade channel **33**. This function is obtained by a laterally extruded camming lug **72** which coacts with the tapered portion **38** aforesaid to spread the blade clamping members **21, 22** of the shaving head **20** to separate the abutment **27** and stops **36**. This operation releases the blade of clamping action. The released position is shown in FIGURE 2 and the clamping action position in FIGURES 4 through 5 from which latter views the magazine has been withdrawn. Thus, this freeing of the blade facilitates pushing it endwise from the razor head when a new blade is pushed from the magazine into the blade channel **33**. A depending flange **73** is extruded from the finger **71** in the same direction as the cam lug **72**, and disposed between said lug and forward end of the magazine **60**, and adapted to engage the ledge wall **39** to vertically stabilize the magazine on the razor head during blade changing operations.

Another feature is the disposition of the coacting parts to so locate the magazine that the front end **70** of the outlet slot **69** is spaced slightly rearwardly from the front stops **36** on the blade platform. The blade that enters the razor head is thus pushed in a straight line which keeps its cutting edge **74** away from the slot end **70** and also clear of the front stops **36**.

When the plunger **62** has been pushed through its full working stroke toward the razor head **20**, the new blade is fully deposited in the blade channel **33** with its butt edge **75** against the stop **27**. The magazine is then withdrawn. This enables the two clamping members **21, 22** of the shaving head to spring toward each other and thus move the blade forwardly by the abutment **27** until its front cutting edge corners become engaged with the front stops **36** to thus impinge the blade in shaving position clearly demonstrated in FIGURE 5. As shown in FIGURE 2, the incoming blade is offset rearwardly of the outgoing blade during blade changing movements thereof. The incoming blade is given the tendency of moving parallel to the abutment **27** induced by the inclined front edge **68** of the plunger **62** acting on the end portion of the blade adjacent its cutting edge as shown in FIGURE 2.

A further salient feature of the razor is the assurance that the blade fed into the razor head endwise from the magazine will have sufficient tension thereon to prevent sliding or fortuitous movement past the stop **36** remote from the magazine **60**. The finger **71** is projected into the razor head substantially half the length thereof to provide adequate bearing between the inter-fitting members **21, 22** since the disposition of the cooperating camming lug **72** and tapered surface of the portion **38** is in the half of the razor head adjacent the magazine, and as the inner-fitting members **21, 22** are spring loaded, the stop **36** nearer the magazine is moved farther from the blade cutting edge than the other more remote stop which is relieved only slightly to enable the used blade to be manually forced past it. The effect of this is to arrest a blade which has been too rapidly ejected from the magazine when the forward end reaches the remote end of the shaving head **20**.

Reference is now made to the novel utility of the movable guard assembly **24** which enables the operator to its intermediate intermittently clean the razor head of beard ladened lather as a having operation progresses without removing the blade from the shaving head or movement otherwise out of normal shaving position. Thus, a shaving operation will not be interrupted by "clogging" about the cutting edge of the blade. The simple application of manual (finger) pressure on the projection finger piece **56** while grasping the handle in the same hand, releases the guard flange **45** to withdraw from between the fixed front stops **36** in opposition to the action of spring **54** to its intermediate position A (see FIGURE 6) to facilitate removal of the beard-laden lather from the blade cutting edge and interior of the razor head, as by water flow from a convenient faucet, whereupon, release of the finger tab **56** enables the spring **52**, or other means such as a separate spring for the purpose, may be employed as the structure of the present invention clearly provides, to automatically return the guard assembly **24** to the position of FIGURES 1, 4, and 5 wherein the shouldered extensions **48** engage the abutments **37** to establish the guard assembly **24** in firm shaving position with the cutting edge of the blade guarded. Upon depressing the finger tab **56** to its extreme position B shown in FIGURE 7, the cam elements **50** projecting through the openings **40** move into camming engagement with the extension **26**, thus forcing the inter-fitting member **21** away from the fixed member **22**, thereby enlarging the blade channel **33** so that individual blades may be fed into said channel by hand independently of use of any blade loading device for the

purpose. Thus, the present razor provides simple loading and unloading of blades successively directly by hand or by a loading device such as, for example, the illustrated manually operated blade magazine may be employed, and in either case, the novel function of the movable guard member **24** is retained to facilitate cleaning the razor head and blade cutting edge without removing the blade or disturbing it otherwise out of its normally clamped shaving position.

Fortuitous displacement of the guard assembly **24** from its normal guarding position of FIGURE 5 cannot occur, since the shaving stroke of the razor head during a shaving operation is in the same direction as the biasing effect of the spring **52**. Thus in effect, the sliding contact of the razor end flange **45** on the face supplements the action of the spring **52** to maintain said guard in "safely" shaving position, a deliberate manual depression of the projection finger piece **56** being required to displace the end flange **45** from its "safety" position shown in FIGURES 3, 4, and 5. Moreover, the novel cleaning operation provided thereby does not interfere in any way with blade-changing operations whether automatic or manual.

Modified Embodiment of FIGURES 8, 9, and 10

The modified head **20***a* shown in FIGURES 8 through 10 is similar to the head **20** of the preferred embodiment previously described with the general exception, however, that the clamping members **21**, **22** are so inter-fitted that member **21** is the movable clamping member designated **21***a*, and member **22** is the member fixed on the handle and designated **22***a*. The movable guard member **24***a* is pivotally mounted on the fixed member **22***a*, as shown in FIGURES 9 and 10, by the bracket **29***a* and pintle **42***a* connections fully described in connection with the shaving head **20**. Member **21***a* is pivotally mounted on fixed member **22***a* by rearwardly extruded downturned lugs **80** projecting through rectangular apertures **81** carried adjacent the bottom margins of the angular extensions **31***a* and **26***a* respectively. The fixed member **22***a* carries the front stops **36***a* and guard control abutments **37***a* while the movable member **21***a* carries the longitudinal abutment **27***a* including the extruded tapered portion **38***a* on the extension **26***a* to form the tapering surface aforesaid within the space **34***a* for the same purpose described in connection with the embodiment of FIGURES 1 through 7. The tapered element **38***a* cooperates with a finger **71***a* of the magazine **60***a* to enlarge the blade channel **33***a* for reception of a blade therein from the magazine, the projection or finger **71***a* is slightly modified by an offset at **82** toward the razor-cutting components to insure that a projected blade from the magazine will slide parallel to the abutment **27***a* clear of the front stops **36***a* to prevent dulling of the edge during blade changing. A lug corresponding to lug **72** of the first embodiment (see FIGURE 1), is oppositely positioned on the finger **71***a* to that shown in the FIGURE 1 embodiment to enable its coaction with the tapered surface **38***a* to expand the blade channel **33***a* for reception of a blade from the magazine in the same manner described in connection with the FIGURE 1 embodiment. Otherwise, remaining parts are identical to those depicted in FIGURES 1 through 7 and possess the same functions. Therefore, further detailed description is considered unnecessary for a clear understanding of the operation of this modified structure except that a separate normally preloaded spring means **83** is employed to bias the member **21***a* into clamping engagement with the fixed member **22***a*, said spring means having its lower end anchored between the rearward upper section **14***a* of the handle and corresponding wall of the band **16***a* and its upper end acting on the rear side of the supporting extension **26***a* (see FIGURES 9 and 10), while the spring **54***a* projecting through the sleeve wall slot **55***a* is effective to urge the movable guard assembly **24***a* into normal disposition as is understood from the foregoing description, said latter spring comprising spring means **52** with the upper section **53** removed.

The special feature of direct manual blade-changing is also provided in this modified arrangement in the way of a finger piece **84** integral with the supporting extension **26***a* to enable manual retracting of the member **21***a* from blade clamping position so that blade changing can be made without using the magazine. An opening **85** is provided in the finger piece **84** adjacent its juncture with the extension **26***a* through which the upper arcuate section of the spring **83** projects into operative engagement with the rear side of said extension to spring the two clamping members **21***a* and **22***a* toward each other to clamp the blade in shaving position as is understood. Thus, member **21***a* may be manipulated without interfering with the free action of the spring. As will be appreciated from the disclosure, by conforming the width of the blade channel **33***a*, as in the case of the preferred embodiment, to the particular width of blade, either the narrow type commonly sold in blade loading magazines as depicted herein, or the wide type sold in packages or dispensers, such latter type blade having a reinforcing metal strip along the butt edge to facilitate handling. Thus, the razor of the present invention is adaptable for using all types of single edge blades whether blade changing be effected by a magazine or directly by hand as is understood.

The two-stage operation of the guard assembly **24** to the operating positions A and B of FIGURES 6 and 7 respectively is retained in the modified structure above for blade cleaning purposes and as an optional means for opening the shaving head **20***a* for insertion and removal of blades directly by hand respectively. When the finger piece **56** is depressed to position A, the cams **50** are brought into contact with the inner face of the extension **26***a* which movement lowers the guard flange **45***a* to facilitate cleaning the blade cutting edge. Further depression of the finger tab **56***a* to position B rotates the cams **50** into operative engagement with the extension face **26***a* thereby forcing member **21***a* rearwardly relatively to the member **22***a* to release the clamping action on the blade. Of course, in the commercial form of the present razor depicted in FIGURES 8–10 only one of the finger pieces **56** or **84** would be used in the design for opening the shaving head, thus eliminating cams **50**, or the finger piece **84** according to the structure preferred for the purpose with simplicity and cost being the determining factors.

Operational Summary

In the preferred embodiment FIGURES 1 through 7, the movable clamping member **22** is inter-fitting subjacently with respect to the fixed member **21**, while in the modified embodiment FIGURES 8 through 10, the movable clamping member **21***a* is inter-fitted superjacently with respect to the fixed member **22***a*, thus providing in a broad patent sense a razor of the type under consideration having either a fixed or a movable blade platform with an independently movable guard member of novel construction and operation, mounted on either type of platform as the case may be.

A special feature of my invention is its ready adaptation to accommodate any of the conventional single-edge type of blades sold in magazine dispensers herein illustrated or the wider blade having a reinforcing metal strip along its butt edge. Thus, the novel advantages provided may be realized without the necessity of supplying a special type of blade and dispenser therefor.

Although the manner in which my invention achieves its objectives should be manifest from the foregoing description augmented by an inspection of the drawing, a brief restatement is deemed apropos, and will be given as follows:

What will be considered a shaving cycle, will now be described with reference to the razor of the instant inven-

tion. Assuming the razor head empty, such a cycle comprises the steps of mounting the magazine **60** on the razor head **20**; sliding the plunger **62** from fully retracted position (FIGURE 1) through its full stroke toward the razor head to insert a blade therein; withdrawal of the magazine from the razor head; thereupon, shaving in usual fashion accompanied by intermittent operation of the guard member **24** for cleaning purposes to prevent "clogging" of the blade cutting edge; and finally, cleaning and drying the blade by retracting the guard member from the cutting edge to unguarded position, for subsequent re-use until a new blade is required.

Thus, it should be manifest that my invention discloses a novel razor combination that is extremely simple in design, easy to manipulate, and free of risk as to personal injury during blade-changing as with a magazine the hands never come in contact with the blades, and in the case of direct manual blade changing, only the end portion is grasped.

The manner in which the present razor may be assembled is deemed to be evident from the drawings, and therefore only certain phases of assembly will be described in detail. The razor head inter-fitting members **21**, **22** or corresponding modified members **21***a*, **22***a* respectively, are fitted together as shown in FIGURES 5 and 9 respectively, with the movable guard member **24** pivotally mounted on the member forming the blade platform, or otherwise supported on a portion of the razor frame. The sleeve **16** is assembled on the reduced extension portion of the fixed members **21** or **22***a* and the leaf spring **52** (FIGURES 1 through 7) or springs **54***a* and **83** (FIGURES 8 through 10), whereupon, the sleeve **16** is press-fitted onto the upper section **14** of the handle to securely anchor the inter-fitting members and springs in a unitary assembly to form the razor of the present invention.

The various elements of the invention are combined to provide a low cost and simple mechanism for loading blades successively into the shaving head **20** or **20***a* as the case may be. The blades are fed individually endwise into the razor head without dulling the cutting edge thereof as the mechanism is designed to feed the blade with its cutting edge clear of any clamping means until it is in shaving position and then only the corners are in engagement with the stops **36**. Furthermore, operation of the guard assembly **24** to facilitate cleaning the blade cutting edge offers no interference to the automatic blade-changing operations described. In this connection, the present invention contemplates individual manual insertion of blades without using the magazine for this purpose. In the case, for example, where conventional single edge blades having a reinforcing strip along the butt edge thereof, are used, such blades may be inserted into the blade channel **33** or **33***a* by grasping the end of the butt reinforcing portion and inserting the new blade endwise into the blade channel while the clamping member **22** or **21***a* is retracted by manual pressure on the finger piece **56** or **84** respectively, to separate the stops **36** from the abutment stop **27** to release the blade for removal. Thus, the present invention enables blade loading automatically from a magazine or directly by hand as desired.

Further considering the operational behavior of both embodiments of the present razor, it is desired to point out with emphasis that the spring action on the guard assembly **24** is effective in the FIGURE 1 embodiment to supplement the spring action on the clamping members **21**, **22** to releasably secure a blade in shaving position therebetween, while in the FIGURE 8 embodiment the spring actions aforesaid are independent for the purposes stated. Moreover, the operator is apprised in either embodiment when the guard flange **45** is moved to position A for blade edge cleansing purposes, by slight resistance reacting on the finger piece **56** due to contact of the razor head expanding cams **50** with the extension **26** or **26***a* as the case may be. Then, if a new blade is desired, slight additional pressure on the finger piece is required to overcome such resistance and move the guard and extension simultaneously to position B, thereby releasing the clamping action on the blade in the shaving head for removal by pushing the end of the new blade against the used blade into shaving position by hand, whereupon, release of the finger piece automatically conditions the razor for shaving as is understood. Thus, the operator is provided with selective first and second stages of operation of the guard assembly depending on whether blade cleaning or a new blade is required respectively, and at each of said stages the cutting edge **46** of the blade is exposed unguarded to facilitate cleansing of the blade edge and interior of the open razor head. Thus, when the guard assembly **24** is displaced from its normal guarding position wherein the razor is conditioned to perform a shaving operation, to either the A or B operating position wherein the blade edge is unguarded, the razor is inoperative to perform a shaving operation.

Referring to the terminology used in the foregoing description and in the appended claims, the identifying expressions and/or terms employed are intended to convey meanings which include the range of reasonable equivalents in the patent sense. For example, the expressions "razor frame," "razor head," "inter-fitting members," "clamping members," "blade channel" are intended to include any structure or chmaber for the reception of a razor blade, particularly of the single-edge type, whether such assembly provides for sliding or pivotal relative movement of the members to accommodate insertion and removal of a blade, or a different type of movement serving the same purpose. The terms "top," "upper," "upstanding," "superjacent," "vertical," "front," "forward," "rear," "rearward," "butt," "lower," "downturned," "depending," "subjacent," and other directional words or characters are intended to have only relative connotation for convenience in describing the structure as illustrated, and are not intended to be interpreted as establishing a definite operating position of the razor or requiring any particular orientation with respect to related structure of the present disclosure or operating position of the razor.

The preferred embodiments of the invention have been illustrated and described. It is to be understood, however, that the invention contemplates any and all modications thereof that may fall within the purview of the claims hereunto appended.

Having thus described my invention, I claim:

1. In a safety razor for use in cooperation with a blade characterized by a cutting edge opposite a butt edge, and having a pair of members adapted to receive such blade therebetween and stabilize the same for shaving until a blade-change is effected, one of said members being fixed on one end of a handle and the other member movably mounted with respect to said one member, a pair of longitudinally spaced arms projecting forwardly from one of said members, and a pair of cutting edge stops forwardly fixed atop the ends of said arms respectively, the improvement which comprises: a blade cutting edge guard member having a forward segment normally spanning said arms in subjacently spaced shaving relationship to said cutting edge, and mounted on one of said pair of members to have relative movement to an intermediate and an extreme position with respect to said pair of members; complemental abutment-engaging portions carried respectively by said arms and guard segment to define the normal position of the latter when said complemental portions are in abutting relationship; a normally preloaded spring reacting between said pair of members to bias the same toward each other to stabilize such blade for shaving; another normally pre-

loaded spring reacting between the one member fixed on said handle and said guard member to bias the guard segment toward its normal position with respect to the cutting edge for shaving; and manually actuatable means operatively associated with said guard member to act on said other member of said pair of members to sequentially displace the guard segment from normal position to intermediate position wherein the cutting edge is abnormally exposed in non-shaving relationship with respect to the cutting edge to facilitate washing lather therefrom without disturbing the stabilized status of such blade between said pairs of members, and to said extreme position wherein the guard segment is additionally exposed abnormally and said pair of members separated to effect release of such blade to facilitate a blade-change.

2. A safety razor constructed in accordance with claim 1 in which said manually actuatable means comprise: a finger piece cooperating with said guard member, a pair of longitudinally spaced eccentric camming elements arranged with one on each side of said guard member adjacent its mounting, and cooperating working surfaces on the other member of said pair of members engageable by said camming elements respectively, for effecting relative separation of the latter to release such interposed blade to facilitate a blade-change in response to manual force exerted on said finger piece to move said guard element to its extreme position in opposition to reaction from both of the aforesaid springs.

3. In an injector-type razor for use in cooperation with a blade characterized by a cutting edge opposite a butt edge, and having a fixed blade platform and a relatively movable clamping plate on said platform for cooperation therewith to define a blade channel adapted to receive such blade in contact with said plate and stabilize the same in shaving position until a blade-change is effected, and a pair of longitudinally spaced fixed stops on said platform adjacent the extremities respectively of such blade cutting edge, and means resiliently urging said plate toward said platform, the improvement which comprises: a two-arm lever pivotally movable between a pair of adjusted positions relatively to the said stops, one of said arms defining a guard segment normally bridging said stops in shaving relationship with the cutting edge of such blade confined in said channel, and the other of said arms defining a finger piece for reception of manual force thereagainst to move said lever; a camming portion on said lever contactible with a complemental working surface on said clamping plate to separate the latter from said blade platform to release said blade; spring means urging said lever to first position at which said guard segment normally bridges said stops, and to a second position against the bias of said spring means to place said camming portion in contact with said working surface to enlarge said channel to accommodate a blade-change, said lever when moved intermediate its said two positions exposes the cutting edge in non-shaving relationship with respect to said guard segment to facilitate cleansing of said cutting edge without disturbing its normal clamped position between said spaced stops and plate; and complemental abutting portions carried respectively by said platform adjacent said stops and guard segment for defining first position of the latter.

4. In a safety razor for use in cooperation with new blades characterized by a cutting edge opposite a blunt edge, and insertable individually between a pair of razor-head-defining members movable relatively from a clamping position on an interposed blade stabilized for shaving to a blade-releasing position, and biasing means for urging said members in one direction toward clamping position, the improvement which comprises: a guard assembly including a spring-loaded cutting edge guard element manually movable on one of said members, against its spring load relatively to said pair of members, from normal position wherein the cutting edge is exposed for shaving, to a different position wherein shaving with the cutting edge is prohibited due to abnormal exposure to facilitate washing lather therefrom without interrupting the stabilized shaving position of such interposed blade; complemental abutment-engaging portions on one of said pair of members and said guard element respectively for defining the normal position of the latter with respect to the cutting edge for shaving when said portions are in abutting relationship; and a manually operatable element associated with said guard element for moving the latter as a unit in opposition to its spring load from normal position to its different position.

5. In a safety razor for use in cooperation with new blades characterized by a cutting edge opposite a blunt edge, and insertable individually between a pair of razor-head-defining members movable relatively from a clamping position on an interposed blade stabilized for shaving to a blade-releasing position, and biasing means for urging said members in one direction toward clamping position, the improvement which comprises: a guard assembly including a spring-loaded cutting edge guard element manually movable on one of said members against its spring load relatively to said pair of members, from normal position wherein the cutting edge is exposed for shaving, to an intermediate position wherein abnormal exposure of the cutting edge prohibits shaving to facilitate washing lather therefrom without interrupting the stabilized shaving position of such interposed blade, to an extreme position to facilitate a blade-change wherein the cutting edge is additionally exposed abnormally; complemental abutment-engaging portions on one of said pair of members and said guard element respectively for defining the normal position of the latter with respect to the cutting edge for shaving when said portions are in abutting relationship; and manually operatable means including a camming element operatively associated with said guard element, to act on the other member of said pair of members to effect relative separation of the latter to blade-releasing position in response to manual-movement of said guard and camming elements as a unit to simultaneously cause said camming element to act on the other member of said pair of members to effect said relative separation thereof.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,067,512 December 11, 1962

Glenn T. Randol

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 1, line 14 and 15, for "expandable" read -- expendable --; line 21, for "safet" read -- safety --; line 29, strike out "freeing", first occurrence; column 2, line 2, for "normal" read -- normally --; line 50, for "type" read -- types --; column 4, line 28, strike out "an"; line 40, after "anchored" insert -- on --; column 5, line 7, for "end" read -- guard --; line 34, for "there to" read -- thereto --; column 6, line 36, for "inner-fitting" read -- inter-fitting --; lines 46 and 47, strike out "its intermediate"; line 48, for "having" read -- shaving --; column 7, lines 14 and 16, for "52", each occurrence, read -- 54 --; line 16, for "safely" read -- safety --; column 10, line 31, for "chmaber" read -- chamber --.

Signed and sealed this 4th day of May 1965.

(SEAL)
Attest:

ERNEST W. SWIDER
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