May 29, 1934. C. C. BLAKE 1,960,406

SAFETY RAZOR

Filed Jan. 2, 1932

Fig. 1.

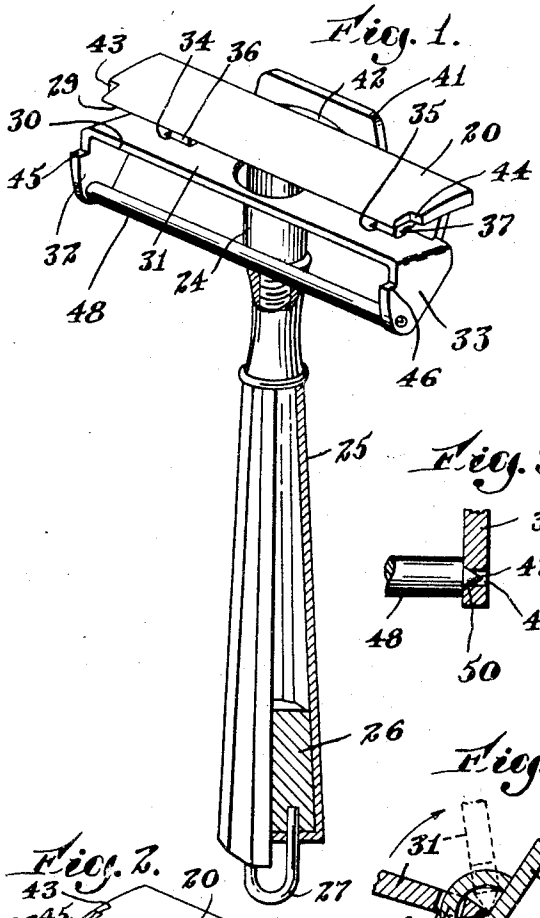


Fig. 10.

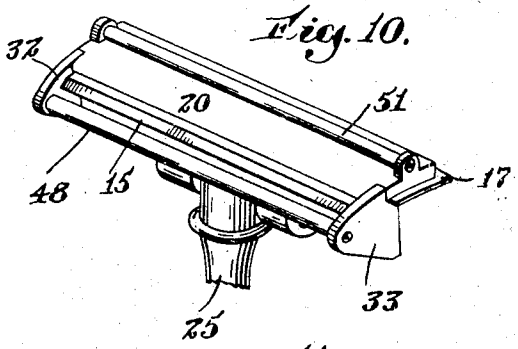


Fig. 3

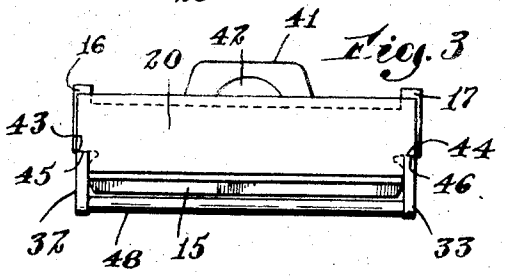


Fig. 9.

Fig. 4

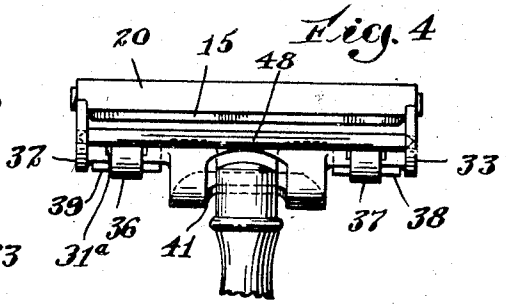


Fig. 8

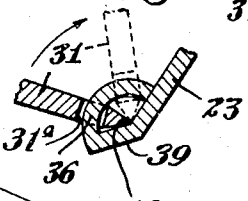


Fig. 7.

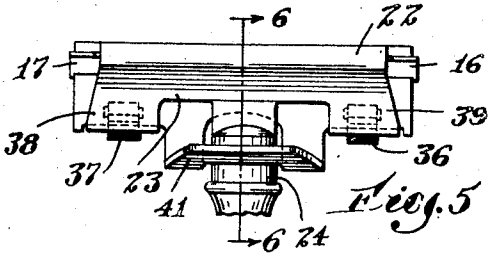


Fig. 5

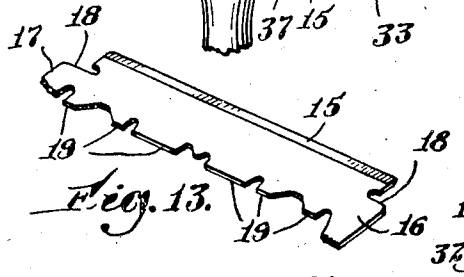


Fig. 13.

Fig. 6.



Fig. 11.

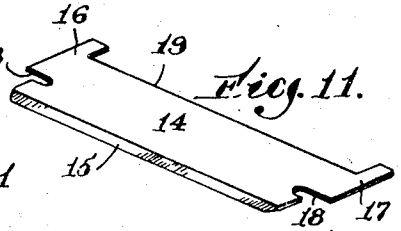
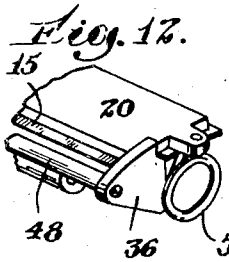


Fig. 12.



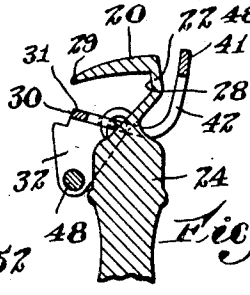


Fig. 7

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SAFETY RAZOR

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Application January 2, 1932, Serial No. 584,379

10 Claims. (Cl. 30—12)

This invention relates to safety razors and more particularly to the type of razors which are provided with detachable blades having such thinness and flexibility as to require external support. Heretofore safety razors have commonly been provided with a backing or seat member having a curved surface and a cooperating guard to clamp the blade and cause it to conform to the curvature of the seat surface. Positioning projections are provided upon the guard and/or seat to register with slots and/or notches in the blade. These projections both restrict the safety razor to the employment of specially constructed blades and determine the extent and regularity with which the cutting edge of the blade protrudes beyond the edge of the seat. Many different arrangements of these projections have been employed in attempts to assure accurate and positive positioning of the cutting edge of the blade relative to the seat or backing member; however, these various arrangements have not proved entirely satisfactory because a substantial curvature is imparted to the blade after it has been initially engaged with the positioning means. When the blade is thus gradually bent, the positioning slots and/notches are distorted out of their original positions and shapes so that their walls do not fit the positioning projections or the like in the same manner as when they were initially engaged therewith. Accordingly the slots and notches of the blade originally fit the positioning means somewhat loosely, and when the blade is distorted by bending there is likely to be some variation in the exact position which the blade edge occupies in relation to the seat or backing member, and one end of the cutting edge may protrude a greater distance beyond the edge of the seat than the opposite end thereof, thus impairing the purpose of the positioning means.

Heretofore the flesh engaging surface or edge of the guard has commonly been provided with a series of slots so that the flesh to be shaved may be engaged by a plurality of curved teeth affording in effect a rake disposed in close proximity to the cutting edge of the blade. As this rake is dragged over the flesh the localized portions of the flesh are depressed causing portions therebetween to protrude slightly between the teeth; thus the rake causes an alternating series of small hills and dales in the flesh in advance of the cutting edge of the blade. Consequently the cutting edge extends over the hills effectively cutting the hair on the tops thereof, but missing hair in the dales, and cutting improperly the hair on the slopes thereof. Thus with the conventional type of safety razor having the rake type of guard, it is necessary to employ repeated strokes over the same flesh area, and it is difficult to avoid too close shaving or even nicking while other localized portions of the flesh may not be shaved closely enough.

The present invention affords a safety razor especially effective in avoiding these disadvantages of the conventional type of safety razor, and particuluarly affording a simple and effective means positively to position the blade so that its edge may be positioned uniformly in relation to the guard and seat. Furthermore, the retaining means for the blade is operable by one simple and short movement of the parts of the holder, so that the blade may be locked in position or released with the expenditure of a minimum amount of time and effort. Preferably the blade itself is effective in causing the retainer to remain in its locking position. Thus the blade itself performs a dual function, not only acting as the cutting element of the razor but also acting as a portion of the means for holding the cooperating parts of the holder in their operative or locked positions. In order to permit continued effective operation of the holding means with the minimum of trouble and necessity for cleaning, a pivotal connection between the parts of the holder is preferably provided, which is of novel form and is particularly arranged to avoid the collection of dirt or clogging. The blade holder is arranged so that the lather and cut hairs do not collect adjoining the cutting edge to impair its effectiveness and involve the necessity of frequent rinsing, while the razor is being used.

A further advantageous feature of the invention relates to the arrangement of a continuous guard, which is preferably a cylindrical bar or roller in advance of and parallel to the cutting edge. Such a guard permits proper and uniform positioning of the blade edge in relation to the flesh, avoiding a too close shave and almost automatically assuring a proper angle between the razor and the surface of the flesh.

In the accompanying drawing:

Fig. 1 is a view in perspective of the safety razor, the handle thereof being broken away to show interior constructions, the backing and its cooperating member being in their open positions ready to receive the blade between them;

Fig. 2 is a detail view in perspective showing the backing and its cooperating member in their closed positions with the conformed and positioned blade clamped between them;

Fig. 3 is a detail view in plan of the parts shown in Fig. 2;

Fig. 4 is a detail view in front elevation, the cutting edge being considered herein for convenience in disclosure to be directed towards the front of the device;

Fig. 5 is a detail view in rear elevation;

Fig. 6 is a detail view in sectional elevation on the line 6—6, Fig. 5;

Fig. 7 is a detail view in sectional elevation of the parts illustrated in Fig. 6, the blade being removed and the backing and its cooperating member being in their separated positions;

Fig. 8 is a detail view in sectional elevation showing one of the knife edges and the guard therefor constituting the pivotal connection between the support for the backing and its cooperating member;

Fig. 9 is a detail view in elevation, partly in section, of one of the bearings for the rotatable guard;

Fig. 10 is a detail view in perspective of a modification comprising a cylindrical roll mounted to rotate upon the external surface of the backing;

Fig. 11 is a view in perspective of the specially constructed blade I prefer to use with the safety razor embodying the various features of the present invention;

Fig. 12 is a detail view in perspective of a third modification comprising finger engaging rings usable in place of the handle illustrated in Fig. 1; and

Fig. 13 is a view in perspective showing how easily the characteristic features of the blade illustrated in Fig. 11 may be obtained merely by breaking in two the double edged blade of a popular type.

Referring to the accompanying drawing, and first more particularly to Fig. 1, my improved razor may comprise a handle 25 in threaded engagement with a stud 24, the latter being integrally connected to the seat or backing member 20 (Fig. 6) by means of a rearwardly inclined plate section 23 and a short vertical wall or stop section 22. The lower surface of the seat 20 is curved in the usual manner to receive one face of a razor blade 14, the radius of curvature of this surface, for example, being of the order of one inch. At each side of the stud 24 the plate 23 has downwardly inclined extensions, each of which are bent to provide a bearing pivotally to support a movable blade retainer 31, which may have a length slightly less than that of the blade 14.

As shown in Figs. 4 and 8, the retainer 31 may have spaced openings 31ª through which upturned tabs 36 and 37 extend from the slightly offset or forwardly bent ends 38 and 39 of the plate 23, which provide journals. The adjacent edge faces of the member 31 are beveled to provide knife edges 40 engaging the lower portions of the plate 23. Thus, as shown in Fig. 8, the rolled tabs 36 and 37 cooperate in defining hollow segments of cylinders, the axial portions of which are engaged by the knife edges 40 substantially at the junctures of the offset portions 38 and 39 with the body portion of the plate 23. Thus the retainer 31 rocks on knife edges which cut through any gummy accumulations and prevent sticking, thereby avoiding a common defect of other types of razors.

The member 31 is in the form of a plate having one beveled edge engaging the bearings provided by the lower extremities of plate 23, as already described, and having an opposite narrow edge face 30, while the ends of the plate are turned at right angles to its body portion to provide offset ends 32 and 33 which are disposed parallel to each other and provide shoulders 45 and 46, as shown in Fig. 1. The seat 20 has stop surfaces 43 and 44 to the rear of its beveled advance edge 29 which are adapted to engage the shoulders 45 and 46 respectively when the retainer 31 is moved into its locking position. The central portion of retainer 31 is provided with an opening 42 through which the stud 24 projects, and an extension of the member 31 provides a yoke or thumb piece 41 at the rear of the razor.

The blade 14 (Fig. 11) may be formed of thin, tempered steel and have such a thinness and flexibility as to require external support for its cutting edge 15. The blade preferably has a critical rear edge 19 parallel to the cutting edge 15 and opposite wings 16 and 17 at its ends with extensions projecting rearwardly of the edge 19, the front portions of these wings providing front critical edges 18 at either side of and somewhat to the rear of the cutting edge 15 as well as parallel thereto. As shown in Fig. 5, the stop wall 22 is somewhat narrower than the seat 20 so that a rearward extension of the blade may be disposed at each side thereof.

The position of the parts of the blade holder when a blade is not held thereby is shown in Fig. 7. To insert a blade 14 between the members 31 and 29, the user grasps the lateral edges of the blade, i. e., the edges of winds 16 and 17, between the thumb and forefinger and drops the blade upon the plate 31 with the rear extensions of the wings 16 and 17 disposed at opposite sides of the stop section 22. Thereupon the yoke 41 may be moved from the position of Fig. 7 to that of Fig. 6, so that the edge face 30 of the retainer 31 engages the lower face of the blade to lift the latter and press its upper face into engagement with the curved surface of the seat 20. As the rocking movement of plate 31 continues, shoulders 45 and 46 upon the flanges 32 and 33 engage the respective critical edges 18 of the blade and force the blade in a generally edgewise direction so that its rear edge 19 firmly engages the stop surface 28 of the rear wall 22, as shoulders 45 and 46 are juxtaposed to stop surfaces 43 and 44. Thus by a single movement of the yoke 41 a slight curvature is imparted to the blade so that it conforms to the curvature of the surface of seat 20 and is securely held between the shoulders 45 and 46 on the retainer 31 and the rear wall 22 of the blade seat. The blade is positively retained against movement due to the engagement of its opposite edges 18 and 19 with parts of the holder and due to the resilient stressing of the blade by the member 31. The edge 15 of the blade is held parallel to the rear wall 22 and it is impossible for one corner of the cutting edge to protrude further from the edge 29 of the seat than the other corner thereof. In this connection it should be noted that the distance between the path of edge surface 30 of the retainer and the lower surface of the seat 20 may be slightly less than the thickness of the blade, so that during the movement of the retainer 31 the surface of the blade may be scraped by the corner of the swinging edge 30 and the member 21 and its connections 22 and 23 to the handle stud 24 may be slightly sprung to assist in the retention of the blade in its locked position.

When the blade is not retained by the holder

the retainer 31 drops loosely to the position shown in Fig. 7, thus being ready for immediate reception of a new blade. Due to the firm frictional engagement of the edge 30 of the retainer with the blade and particularly due to a slight increase in the frictional intensity of this engagement as the corner portion of the edge 30 approaches the edge 29 of seat 22, movement of the retainer 31 toward its released position (Fig. 7) ordinarily is effective in snapping the blade away from the holder, so that it is automatically released without necessity for engagement of the hands of the user with the blade.

It will be apparent that the shoulders 43 and 44 bear the same relation to the stop surface 28 as the critical edge faces 18 bear to the critical edge face 19 when the blade is held in the holder (Fig. 6). The backing member 20 and the edge face 30 constitute blade clamping means, while the stop surface 28 and the shoulders 43 and 44 constitute means for positively positioning the blade edge, thus the edge face 30 and the shoulders 45 and 46 cooperate to subject the blade to pressure applied in two directions normal to each other. The pressure applied to the blade in one direction conforms the blade to the curvature of the backing member and clamps it thereto, while the pressure applied to the blade in the other direction positions the critical edge 19 positively against the stop surface 28 and maintains it thereagainst during use. The exact position of the lateral edges of the blade is not critical and the rearward extensions of the blade may fit rather loosely about the ends of wall 22 so that particular care is not needed when the blade is inserted in the holder. Ordinarily the lateral edges of the blade adjoining the cutting edge 15 may incline rearwardly so that the flanges 32 and 33 engaging these surfaces are effective to bring the blade in properly centered position laterally of the razor, even if the rearward extensions of the blade wings are not uniformly spaced from the wall 22.

The radius of curvature of the blade engaging surface of the seat 20 preferably is substantially greater than the radius of the arc through which surface 30 swings about the knife edges 40. The stop surface 28 of wall 22 joins the blade engaging surface 20 at a line which may be spaced from the axis about which member 40 swings at a distance which is substantially the same as the spacing of the advance edge 29 of the seat 20 from this axis. Thus the stress imposed upon the retainer 31 is substantially within the plane of the body portion of this retainer as the latter moves to its locked position (see Fig. 6).

As shown particularly in Fig. 3 the wings 16 and 17 project into space and therefore it is clear that their utility is limited to the facilitating of the insertion of the blade into the holder and its removal therefrom. This feature of the invention may be taken advantage of practically to increase the available supply of blades capable of use in the holder embodying the various features of the present invention. If an ordinary doubled-edged safety razor blade is broken by bending one cutting edge towards the other the line of cleavage will naturally follow roughly the slot which extends longitudinally along the median portion of the blade. Fig. 13 illustrates a half of such a broken blade. As shown, it is provided with the same characteristics as the blade illustrated in Fig. 11; that is, it is provided with a cutting edge 15, the wings 16 and 17, the critical edge faces 18, and the critical edge face 19. While the latter is not continuous, this does affect its positive engagement with the stop surface 28. Even if the line of cleavage does not produce two uniform wings, as indicated in Fig. 13, the broken blade may be used sucessfully in my razor, as these misshapen wings project into space and are not relied upon to position the blade in the holder.

In order to level the flesh surface to be shaved and thus enable the cutting edge to cut the projecting hairs at their bases uniformly along the entire length of the cutting edge, the arms 32 and 33 support the conical ends 47 of a guard bar or cylindrical roller 48 arranged in close proximity to the cutting edge 15 throughout its length. This cylindrical guard 48 obviates the formation of the objectionable hills and dales in the flesh surface to be shaved, heretofore referred to as being a characteristic feature of the rake type of guard. Furthermore, the guard runs smoothly over the flesh surface to be shaved and stretches the skin evenly for the action of the following cutting edge. Moreover, with this type of razor, there is a noticeable absence of vibration resulting in a relatively quiet shaving operation.

The handle 25 preferably comprises a tapered hollow tube with its larger end remote from the blade holder. A weight 26 is fixed within the large end of the handle substantially to counterbalance the weight of the holder and thus to afford a better balance for the razor during use. An eyelet or hook 27 may be fixed to the free end of the handle so that the razor may be hung upon a hook if desired.

Fig. 10 illustrates a modified construction wherein the holder 20 is provided with upturned ears in which the conical ends of a roller 51 are pivotally received, this roller being of the same type as the roller 48 previously described, the roller 51 permitting the smooth passage of the seat portion of the holder over the flesh.

Fig. 12 discloses a further modification of the invention wherein eyelets 41 are secured to lateral ears projecting from the seat member 20 so that the eyelets may be gripped by the fingers and thumb of the user to hold the razor while shaving, thus permitting elimination of the usual handle and the provision of a very compact razor.

It is evident that a razor constructed in accordance with this invention permits the ready insertion of a new blade and the ready removal of a used blade. When there is no blade in the holder the parts are in the position shown in Fig. 7 and a blade may readily be inserted in engagement with the seat 20, particular care not being necessary during this operation since the retainer 31, when actuated by a single motion of the thumb-piece 41, cooperates with the fixed part of the holder effectively and accurately to position the blade. When a blade is to be removed an upward pressure is applied to the thumb-piece 41 and the blade is automatically ejected. Thus the blade may be locked in its operative position and removed therefrom merely by operation of the thumb-piece 41 at the back of the razor. The blade holder positively engages front and rear edges of the blade properly to position the edge of the blade exactly parallel to the guard 48, while the retainer 30 cooperates with the resiliency of the blade 14 to ensure the latter remaining in its operative position. Thus the seat 20 and retainer 31 cooperate in applying normal pressure to the blade and in holding the same stressed to a suitable curvature so that vibratory movement of the blade edge is avoided. The guard 48 per-

mits the even engagement of the blade edge 13 with the hairs adjoining their bases, assuring a substantially constant angle between the surface of the flesh and the plane of the blade edge and permitting almost frictionless passage of the razor over the face so that the ordinary drag which is characteristic of safety razors is avoided and it is difficult for the user to believe that an effective shaving operation is being performed.

The parts of the blade holder adjoining the blade are particularly free from small crevices or the like to collect lather and cut hairs and thus to hinder the effective operation of the blade. The guard 48 provides a smooth surface over which such material freely passes while the advance edge 29 of seat 20 is beveled and the lower surface of the blade adjoining its edge is free from engagement with other parts so that there is no undue collection of foreign matter adjoining the edge 15 and it is not necessary frequently to rinse the razor during use.

It should be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the appended claims.

I claim:

1. Safety razor comprising a seat, said seat including a plate portion providing a curved surface to receive the face of a razor blade, a stop section substantially normal to a chord of said surface, extensions from said stop shaped to provide bearings, a retainer plate having a marginal portion shaped to engage said bearings, said plate having an edge movable in a path juxtaposed to said surface of the seat, a handle connected to the seat, an extension of said retainer projecting to the side of the handle opposite its margin that engages the bearings, said retainer and its extension providing an opening through which the handle extends, the retainer having end portions disposed substantially at right angles to its body portion, said end portions providing shoulders and cooperating stop surfaces upon the seat engageable with said shoulders.

2. A safety razor comprising a handle, a seat secured to the handle, an extension of said seat affording a stop, a deformable blade having a cutting edge, lateral wings at opposite ends of the cutting edge, and an edge face interjacent the wings and parallel to the cutting edge, a retainer pivotally connected to the seat, said seat having a curved blade-receiving surface initially engageable with a blade along parallel lines adjoining the stop and the opposite edge of the seat, said retainer being initially engageable with a portion of the blade intermediate said lines and being movable to a position to bend said portion of the blade toward said surface of the seat, said retainer having shoulders to engage the edges of the wings adjoining the cutting edge and positively to press the interjacent edge against the stop.

3. Safety razor comprising a seat, said seat having a curved surface to receive the face of a razor blade, a stop section adjoining said curved surface, extensions from said stop section shaped to provide bearings, a retainer plate having a marginal portion shaped to engage said bearings, said plate having an edge movable in a path juxtaposed to said surface of the seat, a handle connected to the seat, an extension of said retainer projecting to the side of the handle opposite its marginal portion that engages the bearings and thus affording a thumb piece, the retainer having end portions disposed substantially at right angles to its body portions, said end portions providing shoulders, and cooperating abutment surfaces upon the seat engageable with said shoulders.

4. Safety razor comprising a seat having a concavely curved surface to engage the face of a thin flexible blade, a retainer pivotally connected to the seat, said retainer having a swinging outer portion to engage the blade and press its face against said seat, the radius of curvature of said surface being larger than the radius of curvature of the path of said portion, the pivotal axis about which said portion swings being disposed between said curved surface and its center of curvature, the path of said portion being spaced from said surface less than the thickness of the blade whereby the blade may be retained in place due to distortion of the parts, said retainer having shoulders at its ends to engage surfaces at each end of the cutting edge of the blade, the seat providing a stop surface parallel to said pivotal axis to engage a rear critical edge of the blade.

5. Safety razor comprising a seat having a concavely curved surface to engage the face of a thin flexible blade, a handle fixed to the seat, a retainer pivotally connected to the seat, said retainer having a swinging outer portion to engage the blade and press its face against said seat, the radius of curvature of said surface being larger than the radius of curvature of the path of said portion, the pivotal axis about which said portion swings being disposed between said curved surface and its center of curvature, the path of said portion being spaced from said surface less than the thickness of the blade whereby the blade may be retained in place due to distortion of the parts, said retainer having shoulders at its ends to engage surfaces at each end of the cutting edge of the blade, the seat providing a stop surface parallel to said pivotal axis to engage a rear critical edge of the blade, said retainer having a thumb-piece projecting therefrom, said thumb-piece having an opening through which the handle extends.

6. Safety razor comprising a handle, a seat fixed to the handle and having a concavely curved surface to engage the face of a thin flexible blade, a swinging retainer, a pivotal connection between the retainer and seat, said retainer having a portion to engage the blade and bend its intermediate portion toward said curved surface of the seat during the swinging movement of the retainer about its pivotal connection, said portion having a curved path about the pivotal connection with a radius of curvature smaller than the radius of curvature of the surface upon said seat, the axis of said pivotal connection being disposed between said curved surface and the center of its curvature, the path of said portion being spaced from said surface less than the thickness of the blade, whereby the retainer engages the face of the blade with a scraping action to bend it and press it against the curved face of the seat.

7. Safety razor comprising a handle, a seat having a lower surface to receive a blade, a depending extension of the seat connected to the handle and providing a rear stop surface to engage a rear critical edge of the blade parallel to its cutting edge, a retainer in the form of an intermediate plate, and flanges at right angles to the plate, said intermediate plate of the retainer having knife edge portions engaging recesses provided by extensions of the seat to afford a pivotal axis, the outer edge of the intermediate plate being adapted to swing upwardly

and press the intermediate part of the blade against said surface on the seat, said flanges of the retainer providing shoulders to engage positioning edges of the blade adjoining its cutting edge, thereby positively to press and hold the critical edge of the blade against said rear stop surface.

8. A razor comprising a holder and a blade, said blade having a cutting edge, a critical edge opposite and parallel with the cutting edge, and short exterior edge portions adjoining the ends of the cutting edge and in general parallel relation thereto, said holder comprising a handle, a seat having a lower surface engageable with one face of the blade, an extension of the seat affording a stop to engage the critical edge of the blade, a retainer, there being a pivotal connection between the retainer and an extension of the seat arranged to afford a pivotal axis adjoining the upper end of the handle, said retainer having a portion swinging in a path beneath said surface of the seat which is normally spaced from said surface at a distance less than the thickness of the blade whereby said portion of the retainer is engageable with the lower face of the blade to press it against the seat due to distortion of parts, said retainer having shoulder portions engageable with said edge portions of the blade and effective to press and positively hold said critical edge against the stop when the retainer is swung to a position to press the blade firmly against the retainer.

9. Safety razor comprising a seat, a retainer, a pivotal connection between the seat and retainer permitting the retainer to swing relative to the seat, the seat having a concavely curved surface to engage the face of a flexible blade, the pivotal connection being positioned so that a part of the retainer may swing in a curved path to engage the blade with a scraping action and bend it toward said surface, said retainer having another part to engage an exterior edge of the blade adjoining its cutting edge, said seat having a stop to engage an opposite exterior edge of the blade, the movement of the retainer being stopped when it positively presses said last-named edge of the blade against the stop, whereby the blade is positively held against edgewise movement.

10. Safety razor comprising a flexible blade, a seat having a concavely curved surface initially to engage a face of the blade along two spaced parallel lines, the blade when thus positioned having a cutting edge parallel to said lines, a stop connected to the seat and engaging a rear edge of the blade opposite said cutting edge, and a retainer pivotally connected to the seat, said retainer having a swinging strut portion engageable with said blade between the parallel lines to bend the blade toward said curved surface, said retainer also having parts engageable with edge surfaces of the blade at either side of its cutting edge, said retainer being movable until the movement of said parts is stopped due to the rear edge of the blade engaging said stop whereupon the blade is locked in place.

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