April 9, 1935. W. G. ADAMS 1,996,736

SAFETY RAZOR

Original Filed Aug. 20, 1931

Fig. 1.

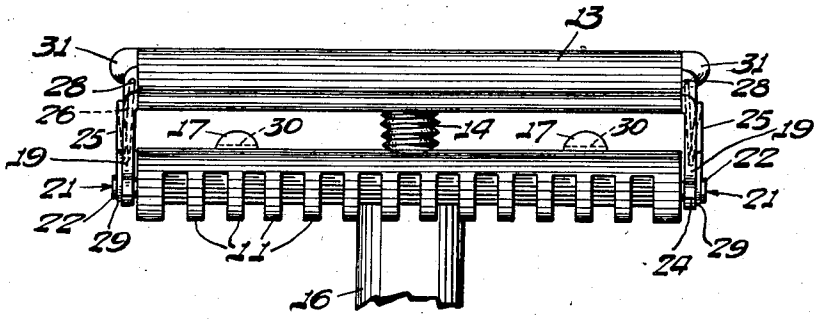
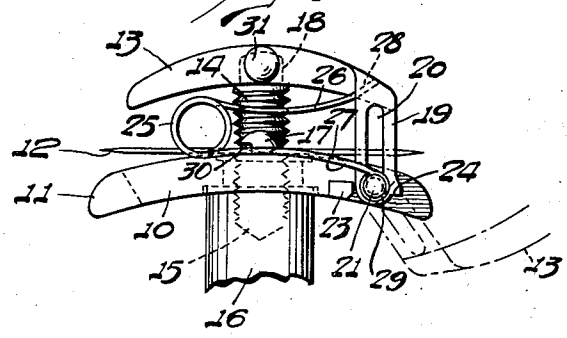


Fig. 2.



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SAFETY RAZOR

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Original application August 20, 1931, Serial No. 558,386. Divided and this application April 24, 1934, Serial No. 722,207

12 Claims. (Cl. 30—12)

This application is a division of my co-pending application for patent for Safety razors, filed August 20, 1931 and bearing Serial No. 558,386.

The invention relates to safety razors, particularly that type including coacting cap and body members connected by screw means and between which an initially or normally flat double edged blade is clamped in flexed condition when in use.

It is well known that the conventional razor of this type comprises a body and a cap the latter being usually provided with a centrally located threaded post received within a threaded socket in the handle. A razor of this character consequently embodies three distinct and separate parts and is open to the objection that in use there is always more or less danger of dropping one of the parts, with probable detriment thereto, as there is nothing to hold them permanently associated. Furthermore the parts must be entirely disconnected to effect proper cleaning. I am aware that it has been proposed to provide a razor in which the handle, body and cap are permanently connected with the cap swingable with respect to the body into and out of clamping relation to the blade. However, in accomplishing this several difficulties are encountered and must be overcome as it is not sufficient to provide a mere loose connection between the body and the cap as it is necessary to provide for considerable rectilinear movement of the cap and body with respect to each other during clamping and releasing of the blade, the rectilinear movement being followed by pivotal movement when effecting release and being subsequent to the pivotal movement when effecting clamping of the blade. Unless adequate provision be made to prevent it there is a probability that the front edge of the cap may drop down and damage the cutting edge of the blade.

It is with the above facts in view that I have devised the present invention which has for one object the provision of a razor or holder in which the handle, body and cap are not only permanently connected though relatively movable but are of such construction and arrangement that the cap has its movement with respect to the body limited to a rectilinear character for a predetermined travel before any swinging movement is possible during release of the blade and, conversely, in which when clamping of the blade is desired pivotal movement is followed by rectilinear movement for the same travel, the character of movement in each instance being definite and limited so as to preclude entirely the possibility of the cap dropping down upon and dulling or otherwise damaging the cutting edge of the blade.

An important object of the invention is to provide a razor of the permanently connected cap type with a screw connection between the handle and cap and in which the cap is pivoted along an axis paralleling and close to the cutting edge of the blade, the arrangement being such that when the cap is swung into open position in non-obstructing relation to the blade there can be no movement of the edge of the cap toward the longitudinal center line of the body, thereby avoiding any possibility of contact between the cap and the edge of the blade with deleterious results to the latter.

Another object is to provide a razor in which the threaded stud may be carried either by the cap for coaction with a socket in the handle, or in which the threaded post may be formed as a part of the handle with the socket in the cap.

A more specific object of the invention is to provide a razor in which the blade may be initially engaged upon the body or carried by means projecting from the cap, the construction in the former instance being such that the blade cannot be picked up and moved with the cap when the cap is moved into open or released position, and in the latter instance being such that the blade will be positively prevented from dropping off when the cap is swung from its open position into superposed relation to the body preparatory to clamping the blade by the action of the threaded post and socket.

Still another object is to provide a razor in which the cap will be positively restrained against any rotary movement with respect to the body while the handle is turned in one direction or the other to effect clamping or releasing of the blade, the cap being guidably connected with the body and the arrangement being moreover such that when the previously opened cap is swung back preparatory to clamping the blade the threaded post will be disposed in coaxial relation to the socket, thereby avoiding any necessity for guidance by hand, during closing of the cap, for the purpose of bringing the threaded socket and threaded post into such axially alined relative position as will permit engagement of the threads when the handle is rotated.

A very important object of the invention is to provide a safety razor in which a spring connection is resorted to for maintaining the cap in parallel relation to the body until swinging

movement of the former is desired to permit free access to the blade, the spring means being particularly advantageous in holding the cap in parallel relation to the body when the cap is swung from its released position back into superposed relation to the body preparatory to clamping the blade.

Yet another object is to provide a razor of this character equipped with stop means carried respectively by the body and the cap and coacting to limit the swinging movement of the cap away from the body.

An additional object is to provide a razor of this character which will be simple and inexpensive to make, easy to use, positive in action, efficient and durable in service, and a general improvement in the art.

To the attainment of the foregoing and other objects and advantages, the invention preferably consists in the details of construction and the arrangement and combination of parts to be hereinafter more fully described and claimed, and illustrated in the accompanying drawing in which:

Figure 1 is a side elevation of a razor constructed in accordance with my invention,

Figure 2 is an end elevation, both views showing the cap in released position ready to be swung into open position.

Referring more particularly to the drawing, the numeral 10 designates the body of the razor which is formed in the ordinary manner as a substantially rectangular plate having guard teeth 11 at its opposite longitudinal edges. As is well known the outer face of the body of a razor of this general type is convex and is adapted to support the blade 12 which is ordinarily provided with a central hole at opposite sides of which are other holes registering with corresponding holes or recesses in the cap and, in some makes, is formed with a longitudinal slot for rendering the intermediate portion of the blade more flexible.

Coacting with the body and adapted to have clamping engagement with the blade for flexing the latter is a cap 13 having a concave undersurface and provided centrally with a threaded post 14 adapted to be received within a socket 15 in a handle 16 which is swivelly mounted within the body 10. Any preferred detailed construction may be resorted to for providing this swivelled connection. However, the point is that the handle is premanently associated with the body and is never detached therefrom at any time. In common with most razors of this type I provide the body with a pair of studs 17 adapted to pass through the end holes in the blade and into registering recesses or holes 18 in the cap for the purpose of centering or positioning the blade properly between the body and cap.

For effecting a permanent association of the cap with the body I provide the former at two corners with spaced parallel arms 19 formed with slots 20 of uniform width engaged upon trunnions 21 projecting from two corners of the body 10 which are represented as having headed ends 22. Projecting from the ends of the body immediately adjacent the inner edges of the arms 19 for coaction therewith are combined guide and stop lugs 23 which are adapted to be engaged by projections on the arms defining shoulders 24 for the purpose of limiting swinging movement of the cap away from the body when the post 14 is disengaged from the socket 15 and the razor is opened up.

Up to this point the construction is similar to what is disclosed in one of the forms of the invention set forth in said parent application. However, a very important feature of the present device is the provision of means for positively holding the cap spaced away from the body and immovable with respect thereto except upon the exertion of a definite force applied in a definite direction. To accomplish this, I provide at each end of the razor a spring having a coil 25 from which extend arms 26 and 27. The arms 26 are anchored within suitable holes 28 at the juncture of the arms 19 with the body and the spring arms 27 have their ends curled, coiled or looped at 29 about the trunnions 21 which, as previously mentioned, are headed at 22 to prevent disconnection of the coils or loops therefrom. These springs operate always to urge the cap 13 away from the body 10.

When the cap is formed and the razor assembled, it is intended that the arms 19 be slightly divergent and that the trunnions 21 be cylindrical so that the slots 20 in the arms may be engaged upon the trunnions, subsequently to which a certain amount of pressure is applied to the arms for moving them inwardly or toward each other so that the trunnions will be received within the slots 20. The trunnions may then be headed and the springs subsequently coiled about the trunnions or, if preferred, the springs may be placed in position and the heads 22 then be formed upon the ends of the trunnions to hold the springs in place. However, there is no limitation in this respect as the trunnions 21 might be formed as screws inserted through the slots 20 and forced firmly into place. These and other details relating purely and simply to expedients in manufacture may be varied within wide limits as the invention is not dependent upon such. In the present instance the studs 17 for positioning the blade are shown as notched at 30 for positively holding the blade upon the body 10 for preventing it from being carried off by the cap when the razor is opened, but there is no limitation in this respect as it is not essential and as, moreover, the construction regarding the studs and openings for receiving the same may be reversed, it being conceivable that the studs may be carried by the cap as indicated in said co-pending application.

Assuming that the razor has been constructed and assembled as shown and described, and assuming that the cap is swung away from the body into the position shown by dot and dash lines in Figure 2, to make use of the device the blade is laid upon the body with its holes engaging upon or receiving the studs 17 which will operate to position the blade properly with respect to the razor parts. The cap is then swung over into the position shown by full lines in Figure 2 so as to bring the post 18 into alinement with the socket. At such time the studs 17 of course aline with the recesses 18 provided for their reception. The springs operate to hold the cap 13 retracted from the body and in parallel relation thereto, or in other words prevent that edge of the cap provided with the arms 19, which edge is of course heavier than the other, from dropping down. The handle 16 is then rotated to engage the threaded post and draw the cap 13 down into clamping engagement with the blade. At such time the slots 20 in the arms 19 will slide down along the trunnions 21, any rotary movement of the cap with respect to the body being positively prevented. The clamping action

of the cap and body, which has their respective confronting faces concave and convex, will flex the blade 12 into shaving position or condition.

When it is desired to open up the razor for replacement of the blade, the handle 16 is rotated in the reverse direction so as to unscrew the connection between it and the post 14, the cap 13 retreating away from the body and the slotted arms 19 sliding along the trunnions 21. At such time the movement of the cap is entirely rectilinear and it is maintained in parallel relation to the body and would be so maintained even though the springs were not provided, as set forth in said parent application. The length of the slots 20 is so co-related to the length of the post 14 that the instant that the post is disengaged from the threaded socket 15 the ends of the slots 20 engage the trunnions 21 and it is at this critical instant that the springs perform their function of holding the cap positively in parallel relation to the body and preventing the slotted arms from dropping down on the trunnions. If this edge of the cap provided with the arms were to drop down the cap could not be rotated as the inner edges of the arms bearing against the lugs 23 would preclude any such possibility. The point is that the springs do operate to hold the cap with the ends of the slots 20 in engagement with the trunnions 21 so that the user may grasp the cap and swing it over into open position. While such is not essential the ends of the cap may be provided with projections 31 which will facilitate grasping it between the thumb and forefinger. When the cap is swung open as shown by the dot and dash lines in Figure 2 the shoulders 24 on the arms 19 will engage the lugs 23 and limit the swinging movement. When the cap is swung the coiled portions 29 of the springs rotate upon the trunnions 21. When the cap is thus swung away the blade may of course be removed and/or replaced. The operation of placing the razor in shaving position has already been described.

From the foregoing description and a study of the drawing it will be apparent that I have thus provided a very simply constructed razor adapted to use the conventional type of blade and embodying parts permanently though movably connected, making it easier to use as the individual parts cannot be dropped or become separated and misplaced. It will be observed that the cap has purely rectilinear movement with respect to the body and blade until it has travelled a predetermined distance, after which it has a pivotal movement to shift it into non-obstructing relation to the blade so that it may be removed for cleaning or drying or for replacement by a fresh one. It is clear that it will be impossible for the edge of the cap to drop down onto or otherwise come into engagement with the edge of the blade and in this way the blade is fully protected against dulling or other damage. This is insured owing to the fact that under no circumstances does the edge of the cap nearest the pivot ever move in a direction toward the longitudinal center line of the body and blade, that is to say until the pivotal movement has progressed into the second quadrant at which time the cap is of course below the blade and therefore out of the way.

From the above it is believed that the construction, operation and advantages of the device will be readily understood by one skilled in the art without further explanation.

While I have shown and described the preferred embodiment of the invention, it should be understood that the disclosure is merely an exemplification of the principles involved as the right is reserved to make all such changes in the details of construction as will widen the field of utility and increase the adaptability of the device provided such changes constitute no departure from the spirit of the invention or the scope of the claims hereunto appended.

Having thus described the invention, I claim:

1. In a razor embracing cap and body members adapted to clamp a blade therebetween and having relative rotary movement, as well as rectilinear movement from and toward each other, the former motion being manually operated and the latter operated by handle actuated screw means having engageable and disengageable screw elements, and in which the members are permanently associated by connecting means embracing a journal carried by one member and an outstanding arm carried by the other member, the arm having an elongated opening wherein the journal is pivotally and slidably engaged; spring means yieldably maintaining the journal in a predetermined position within the said opening throughout all rotary movement whereby the said rotary movement is about an axis in predetermined temporary stable position relative to both members, the connecting means and the spring means acting cooperatively to establish the axis of rotation in said predetermined position as soon as turning of the handle terminates operative engagement of elements of the said screw means.

2. In a razor embracing cap and body members adapted to clamp a blade therebetween and having relative rotary movement as well as rectilinear movement from and toward each other, the former motion being manually operated and the latter operated by handle actuated screw means having engageable and disengageable screw elements, the body having oppositely disposed guards on longitudinal edges, there being means slidably and pivotally permanently connecting the cap, along a longitudinal edge with one of said guard edges of body, comprising journals carried by one member and outstanding arms carried by the other member, the arms each having an elongated opening wherein the corresponding journal is pivotally and slidably engaged, spring means yieldably fixing the journals in a predetermined position within the said openings whereby said rotary movement is about an axis in predetermined temporary stable position relative to both members, the connecting means and the spring means acting cooperatively to establish the axis of rotation in said predetermined position as soon as turning of the handle terminates operative engagement of the elements of said screw means.

3. In a razor comprising cap and body members adapted to engage therebetween a flexible blade, a handle and handle actuated screw means embracing screw elements carried respectively by the cap and handle and adapted to produce relative rectilinear movement between the said members; pivotal lug and slotted arm connecting means permanently associating the cap and body and comprising journal and bearing elements, each in fixed relation to one of the said members, the journal and the bearing remaining separated during operative engagement of the elements of said screw means and until brought into engaged relation by the said handle actuated means and then becoming operative to

establish a pivotal mounting for the cap to the body about which the said members are free to have relative rotary movement, and means preventing the separation of said elements of said connecting means at all times when the elements of said screw means remain substantially out of axial alinement and wherein spring means is provided to cooperate with the handle actuating means to bring the said journal and bearing elements into engaged relation.

4. A razor comprising a body and a cap adapted to have a blade interposed therebetween, a handle swivelly connected with the body, screw means on the cap and handle cooperating to move the cap rectilinearly toward or away from the body, trunnions projecting from the ends of the body, arms projecting from the ends of the cap and having slots slidably accommodating said trunnions during rectilinear movement of the cap toward or away from the body and enabling the cap to be swung laterally when the screw means is disengaged, and spring means for preventing sliding of the slotted arms upon the trunnions during swinging of the cap.

5. A razor comprising a body and a cap adapted to have a blade interposed therebetween, a handle connected with the body, means on the cap and handle cooperating to move the cap rectilinearly toward or away from the body to clamp or release the blade, arms projecting from the ends of the cap and having slots therein, trunnions projecting from the ends of the body and slidably and pivotally engaged within said slots and defining a pivotal axis for the cap closely adjacent a longitudinal edge of the body, said slotted arms being slidable along said trunnions during rectilinear movement of the cap and being rotatable thereon when said first named means is disengaged and the cap spaced from the body, and spring means for preventing sliding of the slotted arms upon the trunnions when the arms rotate during swinging of the cap, thereby insuring constant radius length for the arc of the circle defining the line of travel of the edge of the cap.

6. In a razor embodying cap and body members adapted to clamp a blade therebetween and having relative rotary movement as well as rectilinear movement from and toward each other, the former motion being manually operated and the latter operated by handle actuated screw means, and in which said members are permanently associated by connecting means embracing a pivot carried by one member and an outstanding arm carried by the other member, the arm having an elongated opening wherein the pivot is pivotally and slidably engaged, resilient control means fixing the pivot in a predetermined position within said opening whereby the said rotary movement can be only about an axis in predetermined temporary stable position relative to both members, the connecting means and the screw means acting cooperatively to establish the axis of rotation in said predetermined position and the said resilient control means being effective during all rotary movement.

7. A safety razor comprising a pair of members adapted to clamp a blade therebetween, a pivot element carried by one of said members, a projection carried by the other member and having a slot receiving said pivot element for rotatably connecting the members together and to enable said members to have movement relatively toward each other in a lateral direction, and spring means for resiliently controlling the position of said pivot element in said slot during all rotary movement.

8. In a safety razor having body and cap members and provided with engageable and disengageable means adapted to clamp an interposed blade in operative position therebetween, one of said members having outstanding arms with slots therein, the other member having outwardly projecting pivot elements, said elements being slidably and rotatably engaged within the slotted arms whereby the members are operatively connected, spring means yieldably confining the pivot elements to predetermined position in the slots throughout said rotary movement.

9. In a safety razor having body and cap members and provided with engageable and disengageable means adapted to clamp an interposed blade in operative position therebetween, one of said members having outstanding arms with slots therein, the other member having outwardly projecting pivot elements, said elements being slidably and rotatably engaged within the slotted arms whereby the members are operatively connected, spring means yieldably confining the pivot elements to predetermined position in the slots when the said clamping means is disengaged, said clamping means cooperating with said spring means to dispose the pivot elements in the said predetermined position within said slots, the spring means being located adjacent to and in contact with the pivot elements.

10. A safety razor comprising cap and body members adapted to have a blade interposed between them, means for moving the cap and body relatively to clamp or release the blade, hinge means permanently connecting said members and comprising pivot elements carried by one member and outstanding arms carried by the other member and formed with slots pivotally and slidably engaging upon said pivot elements, and spring means resiliently confining said pivot elements to predetermined position within the slots during rotary operation of said hinge means.

11. A safety razor comprising cap and body members adapted to have a blade interposed between them, means for moving the cap and body relatively to clamp or release the blade, hinge means permanently connecting said members and comprising pivot elements carried by one member and outstanding arms carried by the other member and formed with slots pivotally and slidably engaging upon said pivot elements, and spring means resiliently confining said pivot elements to predetermined position within the slots during rotary operation of said hinge means, said first named means cooperating with said spring means to dispose the pivot elements in said predetermined position within said slots.

12. In a safety razor including cap and body members adapted to clampingly engage an interposed blade, a slot and pin hinge structure permanently but movably connecting the cap and body members, and spring means reacting against the cap and body members for resiliently controlling the position of the slot and pin hinge structure during all hinge action.

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