Oct. 7, 1952 W. B. TULLY 2,612,685

RAZOR

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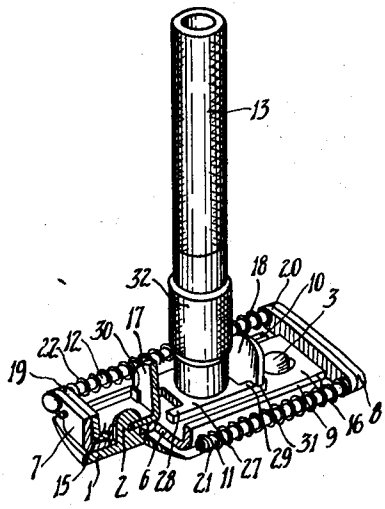


FIG. 1.

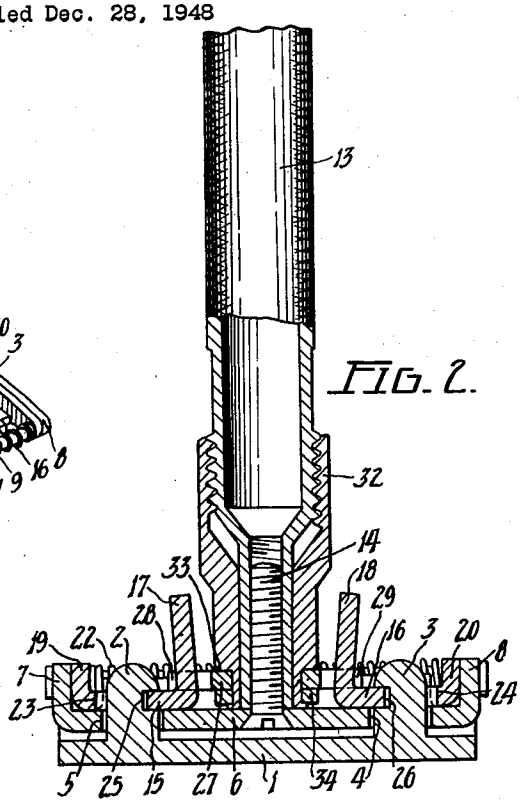


FIG. 2.

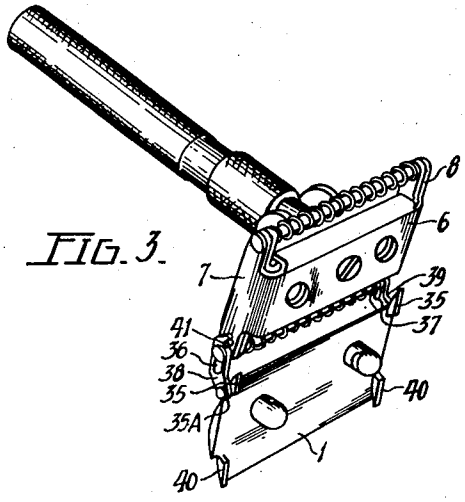


FIG. 3.

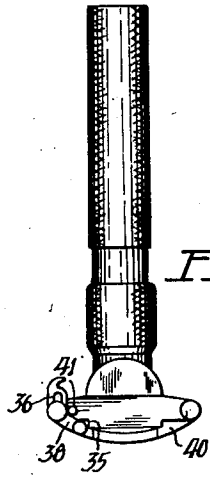


FIG. 4.

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RAZOR

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5 Claims. (Cl. 30—60)

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This invention relates to safety razors of the type in which a flexible blade is clamped between a cap and a supporting plate having co-operating blade-shaping faces (hereinafter referred to as "safety razors"). When a known razor of this type is assembled, the handle is screwed on to a threaded centre pin which projects from the underside of the cap through an aperture in the supporting plate, and when the razor is to be dismantled after use the handle is unscrewed from the pin.

The main object of this invention is to provide means whereby a safety razor may be assembled and dismantled with greater facility than is possible with known razors of this type.

Another object of this invention is to provide a safety razor in which the parts can be secured together by a simple pressure on the handle against the cap and in which the parts can be rapidly released by operation of pressure release means provided in the razor.

A further object is to provide a safety razor comprising only three detachable pieces, including the blade.

A still further object of the invention is to provide means whereby the amount of edge clearance of the blade may be adjusted, thereby altering the depth of cut as desired and allowing accommodation for blades of different thickness.

I attain these objects by the razors illustrated in the accompanying drawings, in which—

Figure 1 is a broken perspective view of a razor in accordance with the invention;

Figure 2 is an enlarged sectional elevation of the razor shown in Figure 1;

Figure 3 is a perspective view showing a modified form of razor in accordance with the invention, and

Figure 4 is an end elevation of the razor shown in Figure 3 but with the cap closed.

According to Figures 1 and 2, a safety razor comprises a transversely curved cap 1 having blade-positioning studs 2, 3 which are provided with rounded upper ends. The studs project from the inner face of the cap and are adapted to pass through apertures 4, 5 in the supporting plate 6. The blade (not shown) is transversely flexible, is sharpened on its parallel longitudinal edges and has perforations to receive the studs. The supporting plate 6 is substantially rectangular in plan and is provided at its ends with flanges 7, 8 extending outwards beyond the longitudinal edges. The supporting plate 6 is also provided along its longitudinal edges, with guide flanges 9, 10 which are curved at their base to provide variable lines of contact between the plate 6 and the blade during alteration in the flexure of the latter, and which also strengthen the supporting plate structure.

Guard rods 11, 12 which are spaced from and

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parallel to the sides of the plate 6, extend through apertures in the flanges 7, 8 and are retained in position by caps formed integrally with or secured to the rod ends outside the flanges. The apertures are of sufficient diameter to allow the rods to rotate therein. The rods may however be welded or otherwise secured to the flanges. The plate is flat on its blade-engaging surface and a handle 13 is secured to the centre of its other side by a screw 14 which is sealed by a suitable sealing compound. The handle may alternatively be welded or riveted to the supporting plate.

Movable catch plates 15, 16 are disposed between the guide flanges 9, 10 on the supporting plate 6 adjacent the handle 13 and are adapted to move towards and away from the latter. Flanges are provided on both ends of the catch plates, the flanges on the inner ends forming finger pieces 17, 18 and the flanges 19, 20 on the outer ends extending laterally to the same extent as the end flanges 7, 8 on the supporting plate 6. The flanges 19, 20 are provided with apertures through which the guard rods 11, 12 extend and thus form supports for the catch plates 15, 16 which may slide thereon. Helically wound compression springs 21, 22 disposed on the guard rods 11, 12 between the end flanges 19, 20 on the catch plates 15, 16 force the latter outwardly away from the handle 13. The catch plates 15, 16 are also provided with apertures 23, 24 disposed substantially centrally therein, through which the ends of the blade-positioning studs 2, 3 project when the razor is assembled. The catch plates 15, 16 are moved under pressure of the helical springs 21, 22 on the guard rods 11, 12 so that the edges of the apertures 23, 24 surrounding the studs 2, 3 enter notches or grooves 25, 26 in the inner sides of the studs and thereby lock the studs against withdrawal through the apertures.

A collar 32 threaded on the handle 13 extends downwardly through a central aperture in a pressure plate 27 having at its ends two pairs of arms 28, 29 which project through recesses 30, 31 in the finger pieces 17, 18. The ends of the arms 28, 29 project through the recesses 30, 31 so as to overlie part of the movable plates 15, 16. The pressure plate 27 is adapted to be moved towards and away from the supporting plate 6 by movement of the collar 32, the pressure plate being located between a circular shoulder 33 and a washer 34 mounted on the collar. The assembly comprising the collar, pressure plate and washer is secured together by turning the lower edge of the collar outwardly under the washer 34.

To assemble the razor, the collar, which for convenience is provided with a left-handed thread, is turned so that it is situated at or adjacent the end of its permitted movement on the handle nearer to the supporting plate. The blade is then positioned on the cap and the support-

ing plate placed over the blade so that the rounded ends of the studs projecting through the blade are disposed within the recesses in the supporting plate. The handle is then pressed towards the cap and the catch plates are forced inwardly towards the handle by the rounded ends of the studs, thereby compressing the helical springs. As soon as the notches in the studs are opposite the catch plates, the latter are sprung outwardly by the helical springs to engage the notches, thus securing the cap to the supporting plate and handle. Alternatively, after the blade has been positioned between the cap and the supporting plate, the finger pieces on the catch plates are pressed against the pressure of the helical springs towards the handle to bring the apertures in the catch plates into alignment with the apertures in the supporting plate and with the studs on the cap. A slight movement of the handle then causes the studs to enter the apertures in the sliding plates which are released when opposite the notches in the studs. The plates then move outwardly and engage the notches as the helical springs expand, thus securing the cap to the supporting plate and handle.

The edge clearance of the blade is then adjusted by rotating the threaded collar on the handle. When the collar is moved away from the supporting plate (upwardly in Figure 1), the pressure plate is moved in the same direction and this causes a pivotal movement of the catch plates about the guide rods which pass through the flanges at their outer ends. The inner ends of the catch plates are thus moved upwardly (in Figure 1) and the studs are similarly displaced. This forces the cap to move closer to the supporting plate and thus increases the blade flexure and decreases the edge clearance of the blade in relation to the helical springs on the guard rods. On the reverse movement of the collar, the blade flexure is decreased and the edge clearance increased. An accurate adjustment of the blade in the razor is thus readily obtainable and blades of different thickness may be efficiently used.

To dismantle the razor, the finger pieces on the catch plates are moved inwards towards the handle, thus moving the catch plates out of engagement with the notches in the studs and allowing the supporting plate to be separated from the cap.

The helical springs on the guard rods provide an efficient type of guard means for the blade, as in passing over the skin, they rotate and thus the amount of friction between the guard and the skin is small as compared with the normal type of fixed guard means.

As above described, the catch plates are adapted to be urged away from the handle under spring pressure to engage notches or the like on the inner sides of the blade-positioning studs. A razor in accordance with the invention may however, incorporate a reverse arrangement wherein the catch plates are urged inwardly to engage notches or the like on the outer sides of the blade-positioning studs. In another form of the invention, slots, ribs or shoulders disposed laterally on the studs may be used in place of the notches or the like located at the inner or outer sides of the studs as described above.

In a modification of the invention illustrated in Figures 3 and 4, the cap 1 is pivotally connected to the supporting plate 6 so that the number of separable pieces of the razor, including the blade, is reduced to two. In this form of

the invention one of the guard rods is extended beyond the outer flanges 7, 8 of the supporting plate 6 and the extended portions pass through slots 36, 37 in links 38, 39 connecting the cap 1 to the supporting plate 6. The extended portions of the guard rod are in the form of flat sided extensions which are parallel at both ends of the rod and fit closely in the slots 36, 37. The links 38, 39 are pivotally connected to the cap 1 by pivot pins secured to lugs 35 formed integrally with the cap. The lugs 35 together with matching integral lugs 40 project outwardly from the face of the cap to provide protection for the edges and corners of the blade and are also adapted to form additional locating means for the blade. Stops 41 provided on the flanges 7, 8 are positioned and the links 38, 39 are shaped so that the latter are prevented from moving past a limiting open position, and the shoulders 35A on the cap limit the angle of movement of the cap by engaging the ends of the links 38, 39 when the cap is approximately in the position shown in Figure 3. The location of the stops and the shape of the links also ensure that the latter must move in a substantially straight line before they can commence to rotate. The remaining parts of the razor are as described above with reference to Figures 1 and 2.

The operation of this modification is obvious from the drawings, the linking means between the cap and the supporting plate enabling the studs on the cap to be withdrawn in a substantially straight line from the apertures in the movable plates, supporting plate and blade before the pivoting movement of the cap commences. In this way there is no jamming of the parts which might otherwise occur and the edge of the blade is prevented from contacting the respective guard spring when the cap is pivoted. The lugs on the cap are adapted to bear against the flanges 7, 8 when the cap is tightened against the supporting plate, and thus prevent the blade edges from being forced inadvertently against the guard springs. When the pivoting movement of the cap commences, the guard rod is rotated, and the flat sided extensions, fitting closely within the slots and being parallel at both ends of the rod, ensure that both ends of the cap are rotated in unison.

I claim:

1. In a safety razor, the combination comprising a supporting plate having apertures therein, a handle secured to the supporting plate, extensions at the ends of said supporting plate, guard rods extending between said extensions and spaced from and parallel to opposite edges of the supporting plate, a blade-clamping cap, studs on the said cap adapted to project through the apertures in the supporting plate, catch plates mounted on the supporting plate, extensions at the outer end of each catch plate, the last said extensions being slidably mounted on the guard rods, anchoring means for the inner ends of said catch plates, the said catch plates being adapted to slidably engage said anchoring means, and helical compression springs mounted on said guard rods and adapted to press the extensions on said catch plates outwardly towards the extensions on said supporting plate, said studs having notches adapted to be engaged by said catch plates under the pressure of said springs for holding said parts in assembled position, the said springs constituting the sole means for retaining the catch plates in engagement with said notches.

2. In a safety razor, the combination comprising a supporting plate having apertures therein, a handle secured to the supporting plate, extensions at the ends of said supporting plate, guard rods extending between said extensions and spaced from and parallel to opposite edges of the supporting plate, a blade-clamping cap, studs on the said cap adapted to project through the apertures in the supporting plate, catch plates mounted on the supporting plate, extensions at the outer end of each catch plate, the last said extensions being slidably mounted on the guard rods, anchoring means for the inner ends of said catch plates, the said catch plates being adapted to slidably engage said anchoring means, finger grips on the inner ends of said catch plates, and helical compression springs mounted on said guard rods and adapted to press the extensions on said catch plates outwardly towards the extensions on said supporting plate, said studs having notches adapted to be engaged by said catch plates under the pressure of said springs for holding said parts in assembled position, the said springs constituting the sole means for retaining the catch plates in engagement with said notches, the parts being so constructed and arranged that inwardly directed finger pressure on the outer sides of said finger grips constitutes the sole releasing motion required for disassembling the parts.

3. In a safety razor, the combination comprising a supporting plate having apertures therein, a handle secured to the supporting plate, extensions at the ends of said supporting plate, guard rods extending between said extensions and spaced from and parallel to opposite edges of the supporting plate, a blade-clamping cap, studs on the said cap adapted to project through the apertures in the supporting plate, catch plates mounted on the supporting plate, extensions at the outer end of each catch plate, the last said extensions being slidably mounted on the guard rods, anchoring means for the inner ends of said catch plates, the said catch plates being adapted to slidably engage said anchoring means, a collar threaded on said handle and rotatably connected to said anchoring means being adapted to move the inner ends of the catch plates away from or towards the supporting plate on rotation of the said collar on said handle, and helical compression springs mounted on said guard rods and adapted to press the extensions on said catch plates outwardly towards the extensions on said supporting plate, said studs having notches adapted to be engaged by said catch plates under the pressure of said springs for holding said parts in assembled position, the said springs constituting the sole means for retaining the catch plates in engagement with said notches.

4. In a safety razor, the combination comprising a supporting plate having apertures therein, a handle secured to the supporting plate, extensions at the ends of said supporting plate, guard rods extending between said extensions and spaced from and parallel to opposite edges of the supporting plate, a blade-clamping cap, studs on the said cap adapted to project through the apertures in the supporting plate, catch plates mounted on the supporting plate, extensions at the outer end of each catch plate, the last said extensions being slidably mounted on the guard rods, anchoring means for the inner ends of said catch plates, the said catch plates being adapted to slidably engage said anchoring means, finger grips on the inner ends of said catch plates, a collar threaded on said handle and rotatably connected to said anchoring means, the said anchoring means being adapted to move the inner ends of the catch plates away from or towards the supporting plate on rotation of the said collar on said handle, and helical compression springs mounted on said guard rods and adapted to press the extensions on said catch plates outwardly towards the extensions on said supporting plate, said studs having notches adapted to be engaged by said catch plates under the pressure of said springs for holding said parts in assembled position, the said springs constituting the sole means for retaining the catch plates in engagement with said notches, the parts being so constructed and arranged that inwardly directed finger pressure on the outer sides of said finger grips constitutes the sole releasing motion required for disassembling the parts.

5. In a safety razor, the combination comprising a supporting plate having apertures therein, a handle secured to the supporting plate, extensions at the ends of said supporting plate, guard rods extending between said extensions and spaced from and parallel to opposite edges of the supporting plate, a blade-clamping cap, studs on the said cap adapted to project through the apertures in the supporting plate, catch plates mounted on the supporting plate, extensions at the outer end of each catch plate, the last said extensions being slidably mounted on the guard rods, finger grips on the inner ends of said catch plates, a pressure plate having a central aperture through which the handle extends, arms on each end of the pressure plate parallel to the guard rods and extending through openings in the finger grips, a collar threaded on said handle and rotatably connected to said pressure plate, and helical compression springs mounted on said guard rods and adapted to press the extensions on said catch plates outwardly towards the extensions on said supporting plate, said studs having notches adapted to be engaged by said catch plates under the pressure of said springs for holding said parts in assembled position, the said springs constituting the sole means for retaining the catch plates in engagement with said notches, the axial position of said collar on said handle determining the clearance between the said cap and the said supporting plate.

WILLIAM BRIGHTON TULLY.

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