

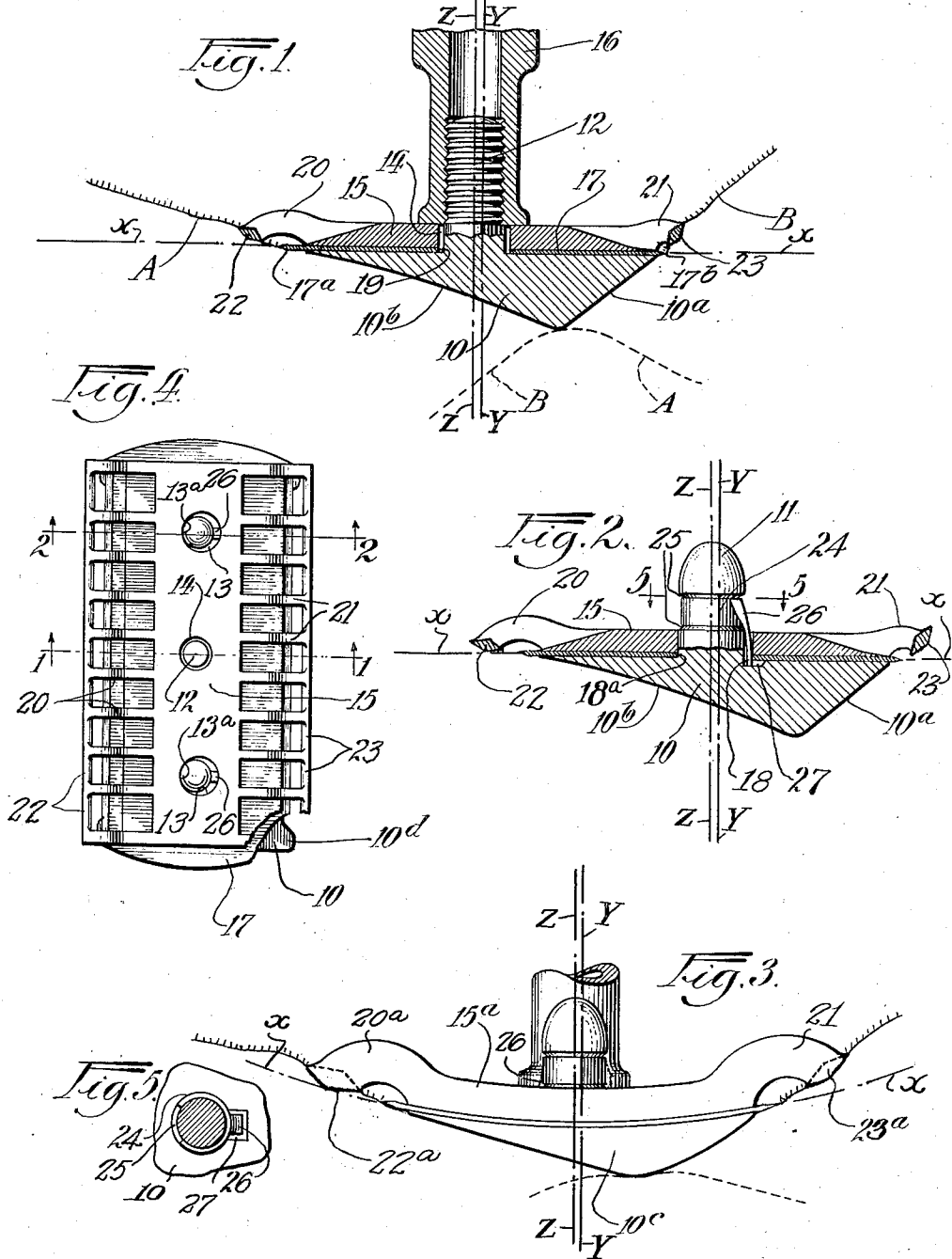
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SAFETY RAZOR

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UNITED STATES PATENT OFFICE

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SAFETY RAZOR

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This invention relates to safety razors and is fully described in the following specification and shown in the accompanying drawings, in which—

5 Figure 1 is an enlarged transverse sectional view on line 1—1 of Fig. 4;

Fig. 2 is a similar view on line 2—2 of Fig. 4;

10 Fig. 3 is an end elevation showing a modified form of the invention;

Fig. 4 is a top plan view of the safety razor showing the handle removed;

Fig. 5 is a transverse section on the line 5—5 of Fig. 2.

15 The embodiment illustrated in Figs. 1 and 2 comprises a cap 10 which has upwardly extending studs or preferably pins 11, one at each end and a centrally located screw 12. The pins and the screw are adapted to pass through suitable openings 13 and 14, respectively, in a guard 15 which is adapted to overlie and conform with the cap 10.

20 A hollow handle 16 is screw-threaded to receive the screw 12. When the handle 16 is screwed thereon, it draws the guard 15 and the cap 10 together, thereby clamping a symmetrical, two-edged flexible razor blade 17 provided with the usual pin openings 18 and the screw opening 19, between them in the usual manner. The cap 10 is constructed with a steep face 10^a at one side and a sloping face 10^b at the other, the side edges of the two faces being designedly not equidistant from the plane *z—z* drawn through the axes of the pins 11 and the screw 12; for a purpose hereinafter described and which characterizes this invention.

25 The guard is preferably provided with laterally projecting teeth or ribs 20 and 21. The ribs 20 are tied together by means of a bar 22 extending along one edge and serving to protect the edge 17^a of the blade 17. In this form, the bar 22 extends down to the plane *x—x* of the razor blade and serves to depress the surface of the skin A while shaving, as clearly shown in Fig. 1.

30 A bar 23 extends along the opposite edge of the guard and connects the ribs 21. The bar 23 lies above the surface (plane *x—x*) of the razor blade so that the blade has a

tendency to cut deeper as it is set at a more rakish angle to the surface of the skin B.

It must be noted that we are here concerned with a device from which greatly different results are obtained for variations of a thousandth part of an inch in the relative position of the several parts.

35 An examination of the art shows that the axes and centers of the blade positioning means, such as the pins 11 of the cap 10, have been heretofore placed in a line midway between the long edges of the cap and seldom out of such midway line in safety razors in which two cutting edges are simultaneously exposed for use, depending entirely for the lateral positioning (in the plane of the blade) of the cutting edges on crude means which neglected entirely the control of the unavoidable easement space between the positioning holder-means and the positioning blade-means. And it is now proposed to show how a simple spring means attached to the blade positioning holder-means can positively prevent haphazard mal-alignment due to the neglect of such conventional easement space, and that such neglected easement space can be utilized to obtain an accurately predetermined projection of the cutting edges of the blade, as well as other valuable results.

40 Therefore, the feature which characterizes this invention is the combination of auxiliary positioning resilient means with positioning rigid means, the axes of which rigid means preferably lie out of the plane *y—y* passed midway between the long edges of the cap and which plane *y—y* is parallel to the plane *z—z* which includes said axes. See Figs. 1 and 3 for illustration.

45 The advantages arising from this novel automatic positioning combination, while obvious enough after being revealed to those skilled in the art, are: first, an accurate abutted blade control by which a predetermined projection is obtained; second, a simple reciprocal and opposite difference in the projection of the cutting edges of a two-edged blade beyond the long edges of the cap; third, a refinement of such control involving automatic precision of systematic parallel-

ism; fourth, such control may include a maximum-minimum novelty; and fifth, a combination of said four advantages with old art.

5 Advantage of old features is taken in devising the cap 10 with the two slopes 10^a and 10^b , either alone or in combination with the guard 15 which has the overhanging side bars 22 and 23. These refinements widen the
10 field of shaving angles. The low angle of 10^b which is preferably hollow-ground, gives a medium close shave, while the steep angle of 10^a gives a closer shave. This is particularly true when 10^a is used with the guard
15 bar 23, this combination being shown in Figs. 1 and 2. It will be understood that the guard 15 may be reversed so as to give four combinations of height of guard and angle of cap adjacent thereto, thereby providing four
20 degrees of closeness of shave. As shown in Fig. 4, the corner 10^a may be extended as in old art to protect the corner of the razor blade and to prevent it from going into the skin of the user.

25 In Fig. 3 is shown a modification of the cap which is designated as 10^c , this cap being concave within and convex on the outside. The guard 15^a is somewhat similar to the guard 15 but is curved to fit the cap 10^c .
30 Also the bars 22^a and 23^a lie preferably above the plane $x-x$ of the upper surface of the blade, one bar being somewhat lower than the other to insure still other degrees of fineness of shave. In any of these forms, the
35 bar lies so close to the skin as to permit the lather to pass over the bar as the bar is pushed along the skin, and in this device serves to present the hair to the cutting edge of the blade in a line of skin exactly parallel
40 to but in a different plane with respect to said cutting edge for each combination of cap and guard as hereinafter described.

In order to prevent the blade and guard from shifting with respect to the cap, the
45 usual easement space between the pins 11 and the edges of the openings 18 and 13 of the blade and guard, respectively, is utilized in the following ingenious manner, primarily to assist as auxiliary means to automatically
50 project one cutting edge while reciprocally withdrawing the other cutting edge a like distance. This action applies to the blade, first; then to the guard.

I provide the pins 11 with the spring clips
55 24 which are set in the recesses 25, Fig. 2, in the pins and have fingers 26 adapted to extend into recess 27 in the cap, and to engage one part of the adjacent inner surface of the openings 18 in the blade so as to keep
60 the opposite part of the inner surface 18^a of said openings against the pins 11. It will also be observed that the handle 16 rotates in a clockwise direction about the screw 12 when the handle 16 is screwed down into tight contact with the guard.

In like manner, when the guard is placed over the pins of the cap, the fingers 26 position the left edge 13^a of the openings 13 of the guard against the pins 11 as shown in
70 Fig. 4. The adjusted position of the blade is undisturbed by the torsion of the handle upon the guard, because the guard acts only as a washer between the blade and the handle, thereby transmitting a perpendicular thrust to the blade. And moreover the blade and
75 guard are in an abutted position before such possible torsion becomes effective. Any possible clockwise thrust from the guard to the blade is further minimized by the difference in material between the soft metal guard and
80 the hard smooth blade. The openings 13 are preferably devised of less width in the guard than the openings 18 in the blade so that when the guard is positioned on the pins 11 it receives the thrust from the fingers 26 into
85 contact with the pins 11 so that the long edges of the guard shall be parallel to the long edges of the cap. Thus the blade and guard are positioned in parallelism relative to the cap and a uniformity of shaving action is guaranteed.

In Figs. 2 and 4, the fingers 26 of the spring clips are shown facing the edge of the cap from which the pins are further, thus causing a minimum parallel projection of
95 the blade to the left beyond the cap. In Fig. 3, the fingers 26 are shown on the other side of the pins, and a maximum parallel projection in the same (left as shown) direction results. And quite obviously, a single
100 spring on the side of a pin toward the end of the cap or holder would readily be adapted to co-act with inherent mechanical parallel-positioning means in a blade "to take up any looseness between said blade and cap" and automatically produce the desired parallel positioning.

While I have shown and described but a single embodiment of my invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made which do not depart from the spirit and scope of the invention as covered by the appended claims.

I claim:

1. In a safety razor, a cap, a guard, a handle, a blade and means for clamping said parts in position for shaving, said cap being provided with combined positioning resilient and rigid means adapted to co-act with apertures provided in said blade to insure parallelism of said cap and blade by automatically taking up any looseness due to the lateral
125 easement space between said cap and blade and moving said blade edgewise across said cap a distance predetermined by said easement space as said parts are assembled.

2. In a safety razor, a cap, a guard, and 130

means for clamping a double-edged blade between said cap and guard, said cap being provided with combined positioning spring and pin means, said pin means lying out of the longitudinal axis of said cap, said combined means being adapted to co-act with positioning pin openings in said blade to automatically take up any looseness between said cap and blade due to the longitudinal easement space between said cap pins and blade openings by moving said blade endwise along said cap, as said parts are assembled.

3. In a safety razor, a cap, a guard, and means for clamping a double edged blade between said cap and guard, said cap being provided with rigid blade-positioning means, said rigid means being in turn provided with resilient blade-positioning means thereon whereby to co-act with positioning means inherent in the blade and automatically take up any looseness due to the easement space between said cap and blade and force said blade into accurate alignment with said cap as said parts are assembled.

4. In a safety razor, a cap, a guard, and means for clamping a blade between said cap and guard, said cap being provided with blade and guard positioning pins attached thereto and lying out of the longitudinal axis of said cap, said pins being provided with spring means thereon whereby to co-act between said blade and cap, and between said guard and cap, and automatically take up any looseness due to the easement space between said parts as said parts are assembled.

5. In a safety razor, a blade, a guard, a handle, and a unit comprising a cap having means in combination with said handle for clamping said parts together, said blade and guard having positioning apertures, said cap being provided with studs smaller than said apertures whereby the blade and guard may be shifted with reference to said unit, resilient means mounted on said unit and located at the side of each stud whereby the cap, blade and guard may be automatically aligned while said razor is being assembled.

6. In a safety razor, a cap, a guard, a handle and a blade, means for clamping said parts together in shaving position, said guard and blade having positioning apertures, said cap member having positioning pins and a clamping handle-engaging stud smaller in diameter than said apertures whereby an easement space is provided wherein said blade and guard may be shifted with reference to said pins, said pins having resilient means mounted thereon and projecting from one side of each pin, whereby one cutting edge of the blade may be caused to move outward from the adjacent supporting edge of the cap a distance equal to the said easement space while reciprocally moving the other cutting edge a like distance inward toward the adja-

cent supporting edge of the cap as the razor is assembled.

In testimony whereof, I have hereunto set my hand this 6th day of July, 1928.

WILLIAM C. ROGERS.

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