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R. E. THOMPSON ET AL

2,108,758

SAFETY RAZOR

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Fig. 1

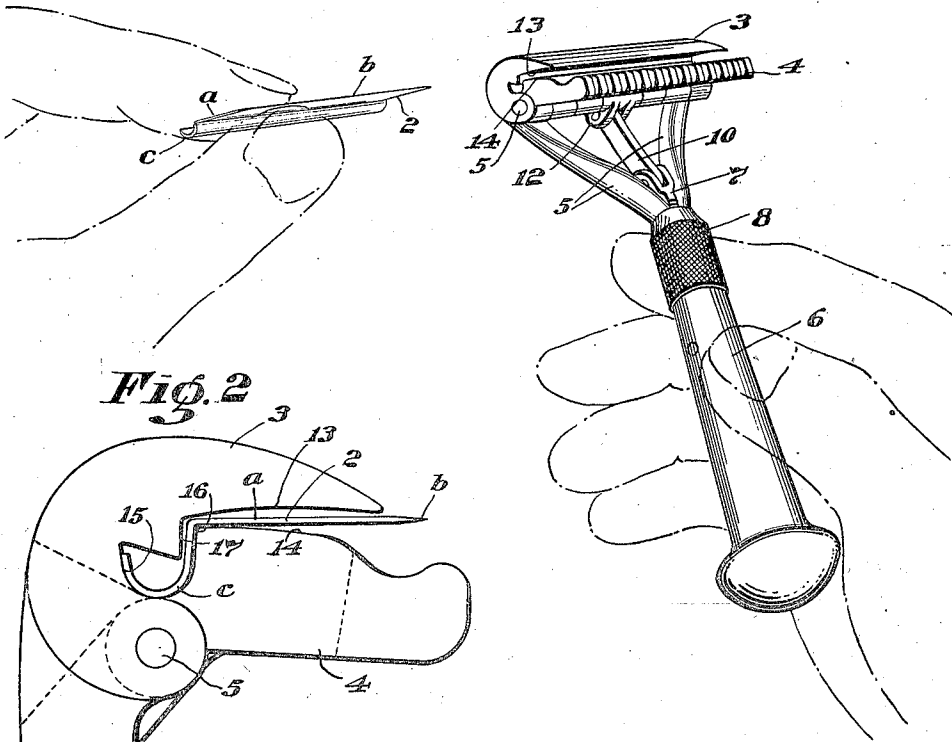


Fig. 2

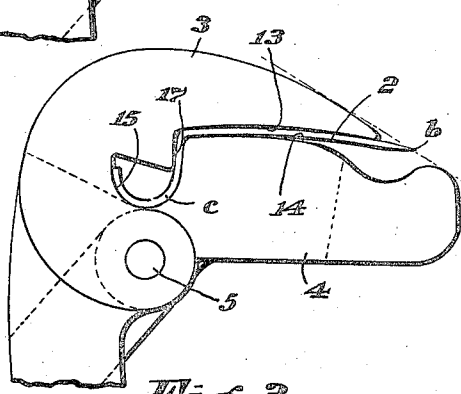
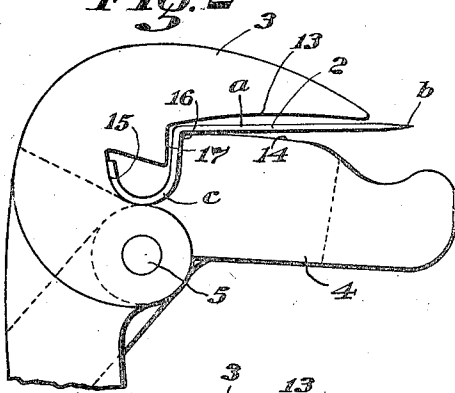


Fig. 3

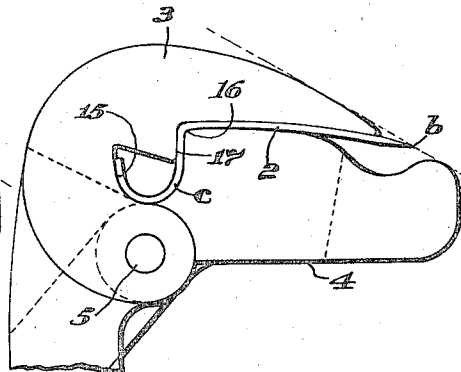


Fig. 4

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SAFETY RAZOR

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Application October 23, 1935, Serial No. 46,294

11 Claims. (Cl. 30—51)

This invention relates to safety razors, and is more especially concerned with those razor structures in which narrow razor blades are used.

In any safety razor it is important to be able to adjust the exposure of the sharpened edge of the blade; or, in other words, to adjust the degree by which said edge projects beyond the guard or other part or parts of the razor holder which serve to limit the approach of the cutting edge to the user's face. In those razor structures in which double edged blades, or other blades of considerable width are used, provision has been made for making this adjustment. These arrangements, however, are not suitable for use in those razors designed to take narrow blades. So far as we have been able to learn, no razor of the latter type has been available heretofore in which such an adjustment can be made. To devise a thoroughly practical solution for this problem forms the chief object of the present invention.

The nature of the invention will be readily understood from the following description when read in connection with the accompanying drawing, and the novel features will be particularly pointed out in the appended claims.

In the drawing,

Fig. 1 is a perspective view of a razor holder and a blade therefor, the holder being constructed in accordance with this invention; and

Figs. 2, 3, and 4 are side views illustrating the upper part of the holder shown in Fig. 1 with the blade positioned therein, and illustrates different adjustments of the blade.

The blade holder shown in the accompanying drawing is designed more especially for use with razor blades of the type shown and described in pending application Serial No. 629,451, filed August 19, 1932, now Patent No. 2,030,833 although not limited to use with such blades. The blade shown in said application usually is made of relatively thin stock, having a thickness somewhere between five-thousandths and eight-thousandths of an inch. It may be made of any of the grades of steel which are commonly used in the manufacture of safety razor blades of the thin type. Preferably it is made of a stainless steel such as that now used in the manufacture of the best safety razor blades. The blade comprises a main or body portion *a* of uniform thickness, a hardened and sharpened edge *b*, and a grooved portion *c* forming part of the body portion of the blade and extending along the margin of the blade opposite to the edge *b*. The dimensions of the groove or hollow rib *c* necessarily

will depend upon the design of the holder in which the blade is to be used. For a more detailed description of the construction and method of manufacture of these blades, reference should be made to the pending application above referred to.

The blade holder or razor per se resembles in general organization the holder shown in Patent No. 1,858,223. It comprises a cap *3* and a guard *4* hinged together at *5* so that these parts can be relatively moved to clamp a blade between them. Extending from the cap *3* and rigid therewith is the split shank *5* of the razor handle which also includes a grip portion *6*. Slidably mounted in the handle is a plunger *7* having screw threaded edges to engage an internally threaded sleeve *8* which is rotatably mounted on the holder at approximately the junction of the shank and grip portions, the arrangement being such that the sleeve can rotate freely but is held against movement longitudinally of the handle. A link *10* connects the upper end of the plunger *7* with an arm or lug *12* which extends rearwardly from the guard *4*. Consequently, when the sleeve *8* is rotated it moves the plunger *7* in or out, depending upon the direction of said rotation, and this motion is transmitted to the guard *4* and results in swinging the guard toward or from the cap *3*.

As clearly shown in Figs. 2, 3, and 4, the lower surface *13* of the cap *3* is curved or has the shape of a small section of a cylinder. The upper surface *14* of the guard *4* is correspondingly curved. Consequently, when the parts *3* and *4* of the holder are closed tightly to clamp the blade *2* securely between them, they bend the blade transversely in a manner similar to that above described as common heretofore. When the holder clamps the blade tightly, as shown in Fig. 4, the cutting edge *b* of the blade will lie in, or very slightly below, the dot and dash line in said figure. But as the guard *4* is dropped slightly the blade will tend to straighten and the edge *b* will rise to a point above said dot and dash line, as illustrated in Fig. 3. When adjusted in this manner the razor will give a closer shave than it will when the parts are in the relationship shown in Fig. 4.

The blade clamping parts *3* and *4* of the holder are so shaped as to provide a groove *15* for the reception of the rib *c* of the blade. Due to the fact that the guard *4* swings about the axis of the pivot *5* as the holder is opened, the groove *15* gradually widens while this opening movement occurs. This is illustrated in Figs. 2 and 3. It is

necessary to hold the blade securely in all positions of its adjustment for the shaving operation. Furthermore, it would be difficult, if not impossible, with very narrow blades to obtain the desired range of adjustment of the cutting edge *b* with reference to the guard and cap of the holder merely in the manner above described while still clamping the blade with the desired degree of firmness. For these reasons the rib *c* is made somewhat wider than the width of the groove *15* when the holder is closed, but nevertheless is narrow enough so that the blade can be inserted endwise into the holder when it is partly open, as illustrated in Fig. 1. This rib portion of the blade has a relatively high degree of elasticity or resiliency and consequently, when the holder is closed after the blade has been inserted, the rib *c* will be compressed transversely in a direction approximately parallel to the width of the blade. As the holder is opened, the rib *c* expands transversely and completely fills the groove *15* until the holder has been opened beyond the mere range of adjustment and far enough to permit the blade to straighten. Consequently, the rib anchors the rear margin of the blade firmly in the holder throughout the entire range of adjustment.

In addition, the expansion of the groove or rib increases the adjusting movement of the edge *b*. It will be observed that when the adjusting or opening movement of the guard *4* begins, the angle *16*, Fig. 4, which fits into the corner in the blade, begins to move forward or toward the right. The expansion of the rib *c* holds the blade firmly against this angle *16* as the opening or adjusting movement of the guard *4* continues. The cap *3* remains stationary. Consequently, the expansion of the rib *c* moves the cutting edge of the blade forward with reference to the cap at the same time that the blade straightens, and it therefore increases the exposure of the cutting edge or, in other words, increases the distance by which the cutting edge projects beyond the forward edge of the cap *3*. The degree of exposure of the cutting edge, and consequently, the character of the shave obtainable, is determined both by the extent to which the blade is flexed, bent or sprung between the faces *13* and *14*, and also by the degree to which the edge of the blade is projected by the expansion of the groove or rib *c*; or, in other words, by the degree to which the rib is transversely compressed or deformed by the walls of the groove in the holder.

A substantial and very fine adjustment of the position of the shaving edge *b* with reference to the guard and the cap thus can be obtained simply by turning the sleeve *8* backward slightly after it has been tightened up to clamp the blade securely in the holder. In all positions of adjustment the blade is backed up by the rib *c* which fits snugly in the groove *15*, this rib also serving to take up any vibration and shock to which the exposed edge portion of the blade may be subjected. Preferably the cap *3* is provided with a rib *17* which extends into the groove *c* and cooperates with the parts of the guard adjacent to the angle *16* to grip a portion of the wall of the groove or rib.

In addition to the foregoing, the rib on the blade and the groove in the holder cooperate to locate the blade accurately in the holder. Furthermore, the arrangement is such that a new blade can be inserted endwise into the holder,

forcing the old blade out, which is an advantage in magazine loading or feeding of the blades.

While we have herein shown and described a typical embodiment of our invention, it will be understood that the invention may be embodied in other forms without departing from the spirit or scope thereof.

Having thus described our invention, what we desire to claim as new is:

1. In a razor structure, the combination of a holder including parts relatively movable to clamp a blade between them in position for shaving, said parts being shaped to receive a hollow rib formed in said blade, and means for relatively moving said parts to squeeze said rib transversely so as to reduce the over-all width of the rib.

2. In a razor structure, the combination of a holder including parts relatively movable to clamp a blade between them in position for shaving, said parts being shaped to receive a hollow rib extending longitudinally of said blade, and means for relatively moving said parts to squeeze said rib in a direction approximately parallel to the width of the blade.

3. In a razor structure, the combination of a holder including parts relatively movable to clamp a blade between them in position for shaving, said parts being shaped to provide a groove to receive a hollow rib extending longitudinally of said blade in a direction generally parallel to the edge of the blade, and means for relatively moving said parts to reduce the width of said groove and thereby to squeeze said rib transversely.

4. In a razor structure, the combination of a holder including parts relatively movable to clamp between them a blade having a flat portion and a rib to secure said blade in position for shaving, said parts being shaped to provide a groove in which to receive the rib of said blade, and means for relatively moving said parts to reduce the width of said groove and thereby to squeeze said rib, and approximately simultaneously therewith to clamp the flat portion of said blade.

5. In a razor structure, the combination of a cap, a guard, means associated with said cap and guard for relatively moving them to clamp between them a blade having both a flat portion and another portion provided with a hollow rib, said cap and guard having blade engaging surfaces cooperating to act on the grooved portion of said blade to contract said portion in the direction of the width of the blade.

6. In a razor structure, the combination of a cap, a guard, means associated with said cap and guard for relatively moving them to clamp between them a blade having both a flat portion and another portion provided with a hollow rib, said cap and guard having blade engaging surfaces operable to bend the flat portion of said blade transversely and to squeeze the rib of said blade in the direction of the width of the blade.

7. A razor blade holder comprising a cap and a guard hinged together for relative closing movement to clamp a blade between them and for relative opening movement to release the blade, said parts being shaped to provide a groove for receiving a rib projecting from the blade, and said groove being so positioned that it will be narrowed in width by said closing movement and will be widened by said opening movement.

8. A razor blade holder comprising a cap and a guard hinged together for relative closing

5 movement to clamp a blade between them and for relative opening movement to release the blade, said parts being shaped to provide a groove for receiving a rib projecting from the blade, and one of said members having a part to enter said groove when the holder is closed, the groove being so located with reference to the hinge that the opening movement of said holder will widen the groove and the closing movement of the holder will reduce the width of said groove.

10 9. In a razor structure, the combination of a cap, a guard, means associated with said cap and guard for relatively moving them to clamp between them a blade having a hollow rib extending longitudinally of the blade in a direction generally parallel to the edge of the blade, said structure being provided with a groove to receive said rib and said groove being so located with reference to said cap and guard that the closing movement of them reduces a transverse dimension of the groove and thereby operates to transversely compress said rib.

15 10. In a razor structure, the combination of a holder including parts relatively movable to clamp between them a blade having a flat portion and a rib to secure said blade in position

for shaving, said parts having members constructed to clamp and flex both the flat and ribbed portions of the blade, and means for relatively moving said parts in one direction to produce said clamping and flexing action and in a different direction to release said blade.

11. In a razor structure, the combination of a holder including parts relatively movable to clamp between them a blade having a flat portion and a hollow rib to secure said blade in position for shaving, said parts being shaped to provide a groove to receive the rib of said blade and also having portions for clamping the flat portion of the blade, one of said parts having a flange to extend into said groove and to cooperate with a portion of the wall of the groove to clamp the rib of the blade, and means for relatively moving said parts to apply clamping pressure to said flat portion of the blade in a different direction from that applied to said rib by said flange and the cooperating portion of the wall of said groove.

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