

Feb. 11, 1936.

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2,030,833

RAZOR BLADE

Filed Aug. 19, 1932

2 Sheets-Sheet 1

Fig. 1

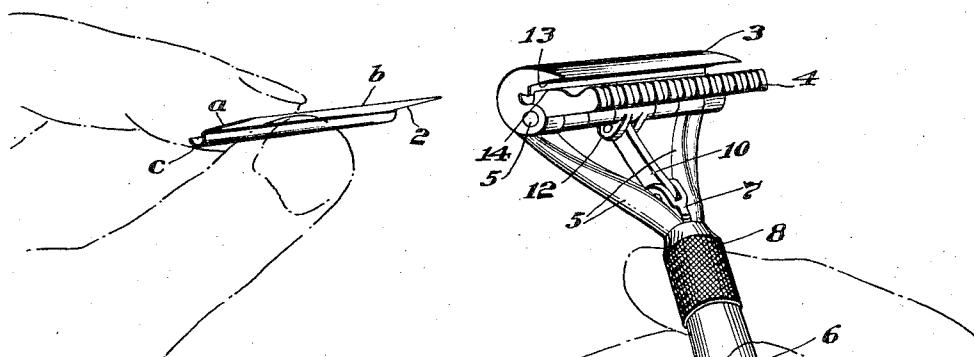


Fig. 2

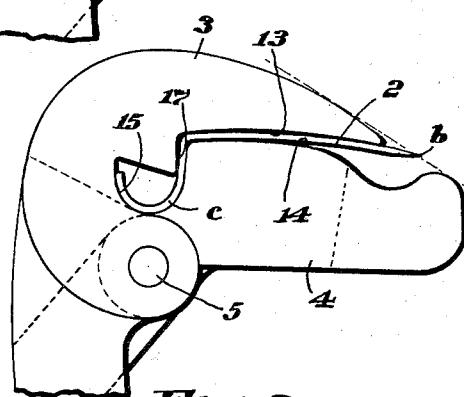
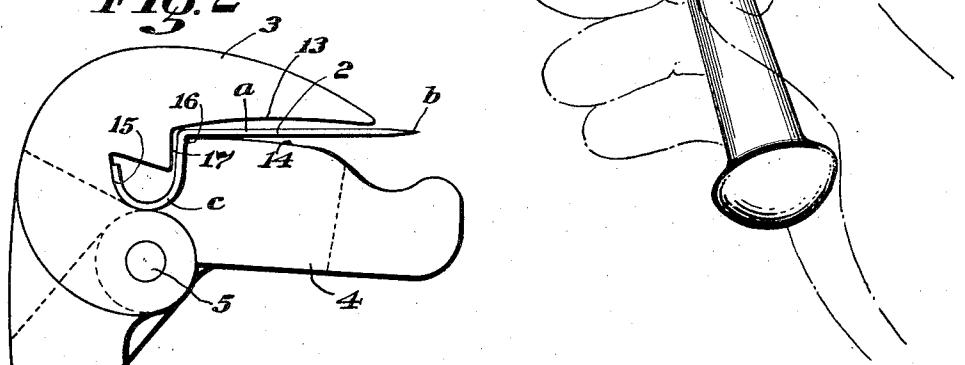


Fig. 3

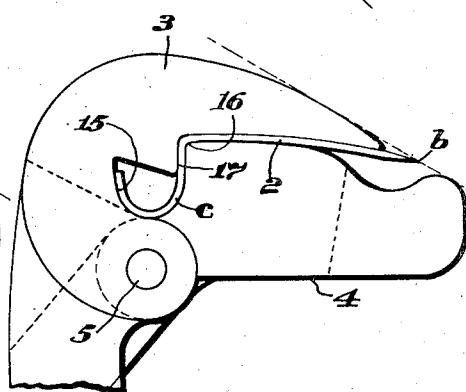


Fig. 4

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Fig. 5

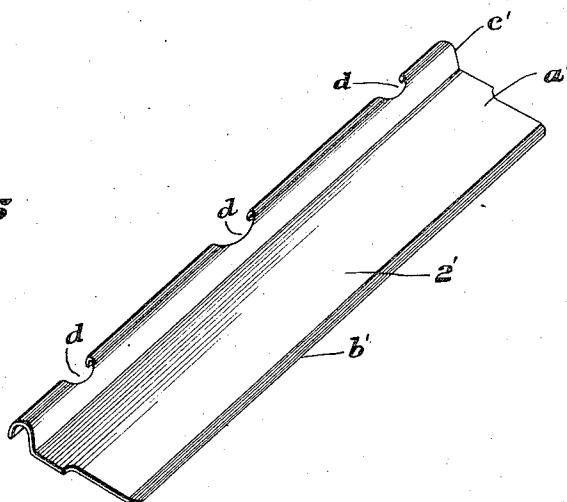


Fig. 6

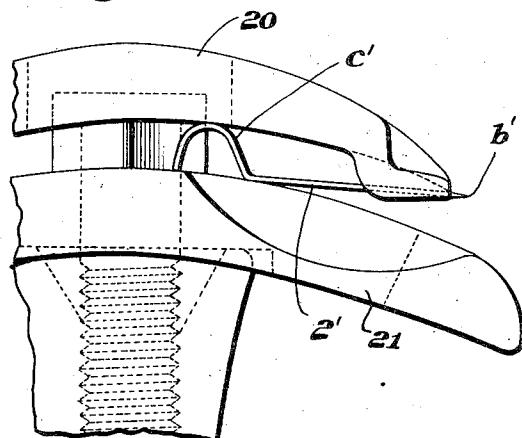


Fig. 7

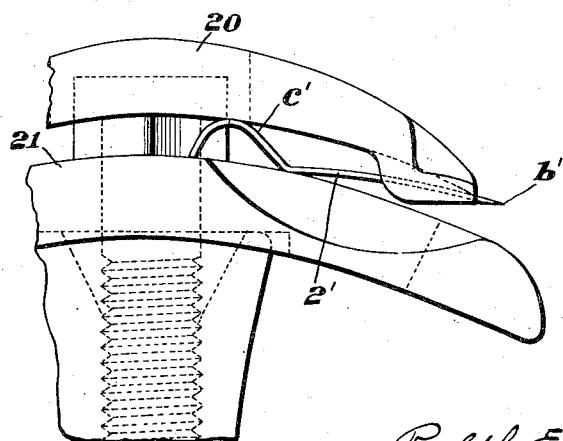
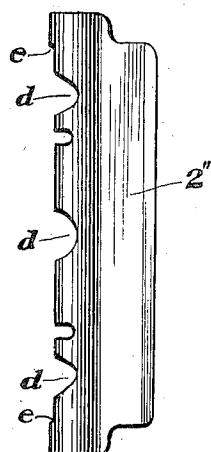


Fig. 8



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UNITED STATES PATENT OFFICE

2,030,833

RAZOR BLADE

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3 Claims. (Cl. 30—92)

This invention relates to safety razor blades. It has been a common commercial practice to make relatively wide double edged blades of thin metal, say for example, six-thousandths to eight-thousandths of an inch in thickness, and to mount these blades in a holder having curved complementary blade clamping surfaces adapted to spring the blade transversely and to hold it in this sprung or curved condition during shaving. An important advantage of this arrangement is that it enables the user to adjust the razor so as to change the exposure of the sharpened edge portions of the blade and thus to vary the closeness of the shave obtainable. This arrangement has not, so far as I am aware, been adopted in those razors which use very narrow single edged blades, largely due, apparently, to difficulties in properly holding the blades when bent or sprung in this manner, but more especially because of the fact that the degree of adjustment so afforded is too small in a blade having a width of, say, one-quarter or three-eighths of an inch, to be of any material value.

The present invention deals particularly with these considerations and it aims to devise a thoroughly practical solution for them. It is also an object of the invention to facilitate the handling and control of safety razor blades, and to provide a blade which can be used in a great variety of commercial forms of safety razors.

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

In the drawings,

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

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;

Fig. 5 is a perspective view of another safety razor blade embodying this invention;

Figs. 6 and 7 show the blade illustrated in Fig. 5, clamped in a holder of a common commercial form; and

Fig. 8 is a plan view of another form of razor blade embodying this invention.

Referring first to Figs. 1 to 4, inclusive, a razor blade embodying this invention is shown at 2. Preferably this blade is made of relatively thin stock, usually 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, embossed or corrugated 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 corrugation *c* necessarily will depend upon the design of the holder in which the blade is to be used, but I consider it preferable to make this corrugation of very substantial dimensions. For example, in a blade having an over-all width of one-quarter inch or three-eighths of an inch, the corrugation *c* may have a width of, say, one-sixteenth of an inch, or slightly more, and preferably has a depth approximately equal to its width. The location of the corrugation, also can be changed, although it is preferable in a narrow single edged blade to have this corrugation extend along the rearward margin of the blade. In a wider or double edged blade the corrugation might be located in the middle of the blade, or two grooves or ribs might be formed in the blade at opposite sides of the median line. In fact, more than one groove can also be used in a narrow blade, if desired.

These blades may be manufactured in essentially the usual manner, the blade preferably, but not necessarily, being maintained in its flat condition until the manufacturing operations have been substantially completed and the groove or corrugation *c* then being pressed into it. According to some methods of manufacture it may be found preferable to harden the entire blade and subsequently to anneal the rearward margin of the body portion and later to corrugate said margin. In other systems, particularly those in which the edge of the blade is hardened by the nitriding process, or some similar method, the entire body portion of the blade will be maintained in an unhardened condition, and it may be given its corrugated shape at any stage of the manufacturing process.

Such a blade may be used in a considerable variety of holders, that shown in Fig. 1 being much like the holder shown in Patent No. 1,858,223, dated May 10, 1932. 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 10 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 corrugation or 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. For these reasons the 50 rib or corrugation *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 corrugated 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 or corrugation *c* will be compressed transversely in a direction approximately parallel to the width of the blade. As the holder is opened, the corrugation *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 corrugation anchors the rear margin of the blade firmly in the holder throughout the entire range of adjustment.

In addition, the expansion of the corrugation 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 corrugation

gation *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 corrugation or 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 corrugation or rib *c*; or, in other words, by the degree to which the corrugation is compressed or deformed by the wall of the groove in the holder. 20

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 25 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 30 be subjected. Preferably the cap 3 is provided with a rib 17 which extends into the groove in the corrugation *c* and cooperates with the parts of the guard adjacent to the angle 16 to grip a portion of the corrugation. 35

A slightly different form of blade is shown in Fig. 5, differing from that illustrated in Fig. 4 in no material particular except that the rib or corrugation *c'* is notched as shown at *d*, these notches facilitating the flexing or deforming of 40 the rib. In addition, the notches *d* assist in positioning the blade when it is used in certain of the commercial holders, such as that of the well known Gillette razor, the notches being so spaced as to fit against the positioning pins and the central post of this holder. Such a holder is illustrated in Figs. 6 and 7. When the blade 2' is used in it and the holder is tightened up, the corrugation *c'* is compressed vertically between the curved cap 20 and the guard 21. As the pressure increases, the corrugation is flattened and deformed more or less, depending upon the degree of pressure. The rearward edge of the blade rests against the positioning pins and the central post and therefore cannot move inwardly. Consequently, the more the corrugation *c'* is deformed, the more the edge *b'* will be projected beyond the edge of the cap. The closeness of the shave obtained thus can be controlled by tightening up the holder more or less. Also, since, as above 50 stated, the corrugation is not hardened and has a relatively high degree of elasticity, it can be deformed to a very substantial extent without exceeding the elastic limit. A further advantage of this blade when used in the holder shown in Fig. 7 is the fact that the blade is clamped more securely in those positions in which the exposure of its edge is greatest. This is important from a practical standpoint since most users who desire a large edge exposure have hard, stiff beards 55 which present unusual resistance to shaving and which, consequently, demand a firmly held blade, although this result is not usually obtained in the commercial forms of razors. A man with a light beard usually prefers a narrow exposure, his 60

beard offers much less resistance to cutting, and it is not so essential, therefore, that the blade be as firmly clamped.

Two blades 2' naturally will be used in the holder shown in Figs. 6 and 7, one at each side, or a special double edged blade having two ribs c' can be made for this particular blade holder.

If the blade is further modified, as shown in Fig. 8, to retain the notches d for accommodating

10 the positioning pins and the central post, and is also cut out as shown at e—e, the blade can then be used in either the old or the new styles of Gillette holders, it being understood that this blade is corrugated just as is the blade shown in 15 Fig. 5. The rearward edge of this blade fits against the rib of the new style Gillette holder, the ends of this rib lying partly in the notches e—e.

The invention thus provides a blade which can 20 be used in several forms of commercial razors and with which a relatively large but accurate adjustment of the blade edge can be made to suit the requirements of different users. In addition, the blade is much easier to pick up from a flat 25 surface and therefore easier to handle and control than are the common flat blades, due to the presence of the corrugation or rib c.

The novel holder construction disclosed in 30 this application is not claimed here but will be made the basis of an independent application.

While I have herein shown and described typical embodiments of my invention, it will be evident that the invention may be embodied in other forms without departing from the spirit or 35 scope thereof. For example, the corrugations may take other forms while still producing certain of the advantages above described.

Having thus described my invention, what I desire to claim as new is:

1. A flexible safety razor blade comprising a relatively thin metal body provided with a hardened and sharpened edge, said body having a groove extending along the margin thereof opposite to said edge, and the walls of said groove being resilient, whereby the resiliency of said walls may be utilized in anchoring the blades in its holder. 10

2. A safety razor blade comprising a relatively thin metal body provided with a hardened and sharpened edge, said body having a groove extending along the margin thereof opposite to said edge and including a flat portion connecting said groove with said edge, the walls of said groove being sufficiently elastic to permit substantial deformation of them within the limit of resiliency of said walls, whereby said resiliency may be utilized in anchoring the blade in its holder. 15

3. A safety razor blade comprising a relatively thin flexible metal body provided with a hardened and sharpened edge, said body having a groove extending along the margin thereof opposite to said edge and presenting a rib on the side of the blade opposite to said groove, the walls of said groove being resilient, thereby being adapted to anchor the blade in its holder due to the resiliency of said walls, said walls being of substantially the same thickness as the body of the blade, and the groove having a depth substantially greater than the thickness of said body and of such dimensions that it may be utilized to anchor the blade in its holder. 20 25 30

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