June 30, 1931. F. WIESE 1,812,422

SAFETY RAZOR

Filed Nov. 9, 1925

Fig. 1.

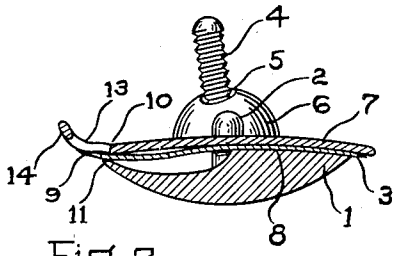


Fig. 2.

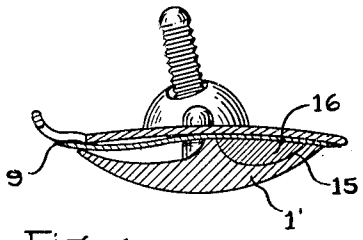


Fig. 3.

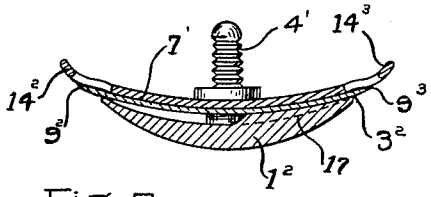


Fig. 4.

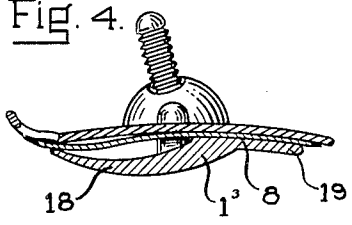


Fig. 6.

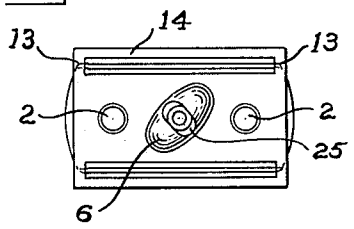


Fig. 5.

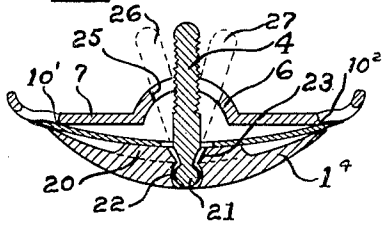


Fig. 7.

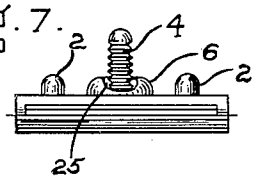
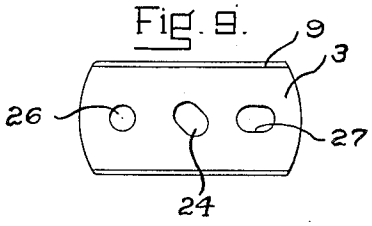


Fig. 9.



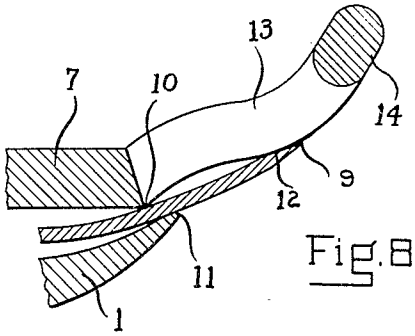


Fig. 8.

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ATTY.

Patented June 30, 1931 1,812,422

UNITED STATES PATENT OFFICE

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SAFETY RAZOR

Application filed November 9, 1925, Serial No. 67,999, and in Germany December 16, 1924.

This invention relates to safety razors of the type in which a flexible wafer-like blade is clamped between a cap and a guard member.

Among the objects of the invention are to provide a construction which will give the blade a reverse curve of novel characteristics; to absorb any and all vibrations which may be set up in the blade during the use of the device, to protect the corners of the cutting edge of the blade and also to support these corners, thus precluding vibrations longitudinally of the cutting edge; to provide for the adjustment of the handle relatively to the head of the razor, whereby to facilitate its use for shaving in a direction diagonal to the cutting edge; and to provide a blade usable in the above types of razors which has novel and positive positioning means. Other objects and advantages of the present invention will be particularly pointed out in the accompanying specification and claims read in connection with the drawings, in which:

Figs. 1, 2, 3 and 4 are transverse sectional views of four forms of my razor, showing how the invention may be applied, each of these forms being designed for using only one cutting edge of the blade at a time;

Fig. 5 is a central transverse section showing the method of adjusting the handle relatively to the head;

Fig. 6 is a plan view of the form of razor shown in Fig. 5.

Fig. 7 is an edge elevation of the razor shown in Fig. 6.

Fig. 8 is an enlarged section of a portion of the razor of any one of the above modifications showing the method of clamping the blade adjacent to its edge and its relation to the ends of the guard; and

Fig. 9 is a plan view of a blade usable in any one of these razors.

Referring to Fig. 1, the blade-clamping cap is indicated at 1 and is shaped in section substantially like a curved tooth. It is provided with positioning pins 2 which are adapted to protrude through and position the blade 3 relatively to the cap in a manner later to be described. A threaded stem 4 is associated with the cap 1 in a manner also later to be described. This stem 4 protrudes through a central aperture in the blade 3 and thence through an aperture 5 in a dome-shaped boss 6 on the guard member 7.

The cap 1 and guard member 7 are provided respectively with convex and concave surfaces positioned opposite each other when the parts are in operative position and together serving to clamp a substantial area of the blade 3 and flex the clamped portion of it in one direction, the convex surface of the cap 1 being indicated at 8. The guard is provided at 10 (Fig. 8) with a shoulder which serves as a fulcrum for flexing the blade in a direction opposite that to which it is flexed by the surface 8 and the cooperating surface of the guard 7. The cap 1 is provided on its left-hand side as seen in Fig. 1 with an edge portion 11 bearing on the blade 3 on a line nearer the cutting edge 9 of the blade than the fulcrum shoulder 10 and parallel with both of these. This construction of the cap and guard serves to give the blade a single reverse curvature extending substantially all of the way between its edges, thereby retaining its cutting edge 9 substantially rigid. Fig. 8 also shows the manner in which the blade bevel 12 is supported at its ends by making contact over the entire width of the bevel with the portion 13 of the guard, which in turn carries the bar guard 14 at both ends, Fig. 6. It is to be understood that this same idea could be utilized with a toothed guard by making the end teeth of a configuration similar to that shown at 13.

Fig. 2 shows a razor identical with that shown in Fig. 1 with the exception that the cap member 1′ is recessed as shown at 15, this recess being filled with lead or other relatively soft and nonresilient material 16 which serves to absorb any vibrations which may be transmitted to the rear portion of the blade from the cutting edge 9 while the device is in use.

Fig. 3 shows the invention applied to a razor using a blade having a single curve, in which case a double edged blade 3^2 may be used. Only one edge of the blade is designed to be used in this form of razor, as in those shown in Figs. 1, 2 and 4, the guard 14^2 being

used in connection with shaving and the guard 14^3 being only to protect the edge not in use. In this modification the stem 4′ is fixed to the head 1^2 and protrudes through suitable apertures in the blade 3^2 and guard 7′ thus permitting but a single position of the handle substantially symmetrical with the head of the razor. The cap 1^2 may be grooved transversely as indicated by the dotted line 17 and soft material, as for example lead, inserted in the grooves for the same purposes as in the razor shown in Fig. 2.

Fig. 4 shows a form of the razor similar to Fig. 1 with the exception that the head 1^3 is of lighter construction than the head 1 of Fig. 1. The head 1^3 comprises a relatively light tooth-shaped portion 18 which is integral with the bearing portion 19, the latter being provided with a surface 8 as is the cap 1, Fig. 1.

Figs. 5, 6 and 7 show the invention applied to a double edged razor in which the enlarged bearing portion of the cap on the blade is made as a series of lugs or ribs 20 centrally of the cap. The flexing of the blade is accomplished by fulcrum shoulders 10′ and 10 similar to shoulder 10, Figs. 1 and 8, portions of the cap 1^4 overhanging these fulcrum shoulders on either side in the same manner as is shown in detail in Fig. 8.

The means for mounting the handle at various angles with the head of the razor may comprise a ball and socket connection between the stem 4 and the cap 1^4, the blade and guard being provided with suitable enlarged openings for permitting the adjustment of the stem relatively to the cap. While a universal adjustment may for some purposes be desirable, and is contemplated by this invention, I have shown an adjustment on a line making an angle of approximately 45° with the cutting edge or edges of the blade. This is accomplished by providing the stem 4 with an enlarged ball-like head 21 which fits within a similarly shaped socket 22 in the cap 1^4, the stem 4 protruding through a tapering aperture 23 in one of the enlargements 20. The blade 3 is provided with a central elongated aperture 24 arranged at an angle of approximately 45° with its cutting edges and the guard 7 is provided with a dome-shaped boss 6 having an elongated aperture 25 therein similar to and parallel with the aperture 24 in the blade, whereby the stem 4 may be adjusted through a range, the limits of which are indicated by the dotted outlines 26 and 27 in Fig. 5.

Fig. 9 shows a blade 3 provided with a central elongated slot 24 for the purpose described above and permitting angular adjustment of the stem without disturbing the position of the blade. It is also provided with positioning apertures for engagement with the pins 2 of the cap. One of these apertures 26 is preferably of substantially the same size and configuration as one of the pins 2, whereby to position that portion of the blade in all directions; the other aperture 27 is shown elongated in a direction parallel to the cutting edges of the blade, and preferably also the long dimension of the aperture 27 is on a line passing through the center of aperture 26, providing for slight variations in the dimensions of the parts employed.

It is to be understood that in each of the above described modifications of the invention any suitable type of handle may be provided to engage with the threaded stem 4 or 4′, in each case bearing against the enlargement 6 of the guard portion or that portion itself, thus clamping all of the parts together. When the stem 4 is positioned centrally of the razor as shown in the full line position, Fig. 5, the handle will be symmetrically disposed with respect to the head of the razor. If, however, the user desires to shave with the so-called "diagonal stroke," it may be convenient to adjust the handle to one of the dotted line positions as seen in Fig. 5 or as shown in full lines in Figs. 1, 2 and 4 or any intermediate position, whereby if the handle is drawn in the direction which it is desired to shave, the blade will be held at an angle with that direction which in the opinion of some users gives a better and more comfortable shave.

As it is obvious that various modifications, using the basic ideas outlined above, may be made, I do not wish to limit myself except by the scope of the appended claims.

What I claim is:

1. A safety razor comprising a thin wafer-like blade and cap and guard members adapted to clamp the blade between them so as to flex it transversely of its cutting edge, in which the guard is provided with projections at both ends extending above the remainder of the guard, curved reversely as compared to the blade curvature and shaped to make contact with the blade only over the width of the bevel at both ends of the cutting edge, thus protecting the ends of the edge.

2. A safety razor comprising a thin wafer-like blade and cap and guard members adapted to clamp the blade between them so as to flex it transversely of its cutting edge, in which the cap and guard are provided with relatively large surfaces cooperating with each other to clamp the blade when the parts are in operative position, another portion of the cap having a line contact with the blade, and a portion of one of said surfaces being provided with a recess which is filled with a soft and substantially non-resilient metal to absorb any vibrations of the blade while in use.

3. A safety razor comprising a thin wafer-like blade and cap and guard members adapted to clamp the blade between them so as to

flex it transversely of its cutting edge, said blade having positioning apertures therein and an elongated slot at an oblique angle to the cutting edge of the blade, and a threaded stem having a ball and socket engagement with the cap, the guard being provided with a dome-shaped boss thereon having an obliquely disposed elongated slot adapted to register with that in the blade to permit the threaded stem to pass through both when the parts are in operative position, said threaded stem adapted to engage a handle, whereby the handle may be adjusted relatively to the razor head to adapt the razor for shaving with a diagonal cutting stroke.

4. A safety razor comprising a cap, a guard, a flexible blade, and means to hold the parts in assembled relation, the cap having a relatively large convex surface adapted to clamp that portion of the blade away from its operative edge between itself and a correspondingly-shaped portion of the guard, said guard having adjacent to the operative edge of the blade a fulcrum shoulder, and the cap having a portion making a line contact with the blade and overhanging the fulcrum shoulder, whereby the blade is given a single reverse flexure in a direction transverse to its cutting edge.

5. A flexible blade for safety razors having two positioning apertures shaped to retain the blade against transverse displacement and a slot located between them and arranged at an oblique angle to the cutting edge of the blade.

In testimony whereof I affix my signature.

FRANZ WIESE.