March 10, 1936. J. E. McWILLIAMS 2,033,725

RAZOR BLADE

Filed Nov. 19, 1932

Fig. 1.

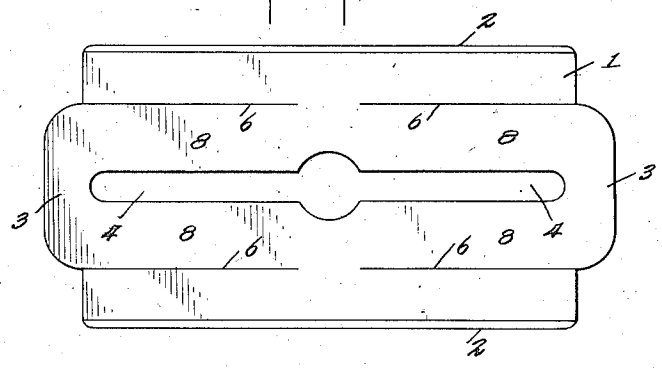


Fig. 2.

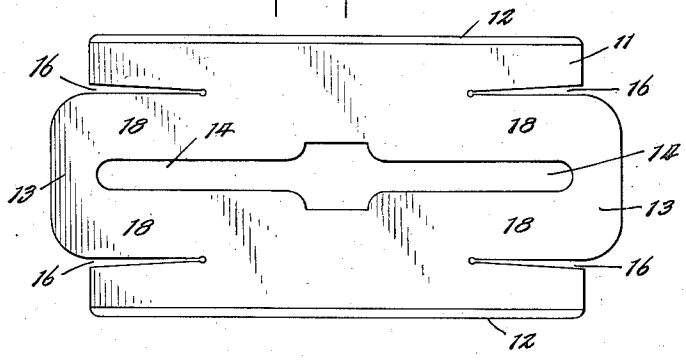


Fig. 3.

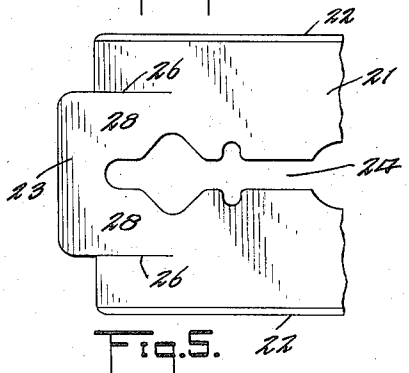


Fig. 4.

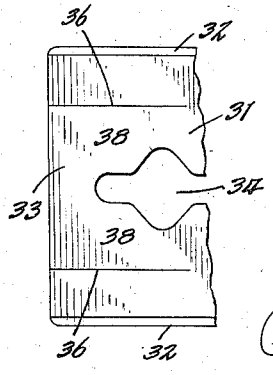
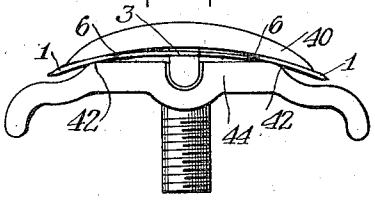


Fig. 5.



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RAZOR BLADE

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Application November 19, 1932, Serial No. 643,490

8 Claims. (Cl. 30—93)

This invention relates to an improved blade for safety razors, and in particular, to a flexible blade for razors of the class in which the blade is held in a bent position in the holder. The object of the invention is to minimize cracking or breaking of the blade and to preserve a straight or plane edge for the blade when clamped in the holder.

In the drawing:

Figures 1 and 2 are plan views of blades formed in accordance with this invention, each figure showing a separate modification thereof; and

Figures 3 and 4 are fragmentary plan views illustrating further modifications of this invention.

Fig. 5 is a view in end elevation showing diagrammatically the relation of a blade constructed in accordance with this invention to the cap and guard of a safety razor of common construction.

As shown in Figure 1, a razor blade constructed in accordance with this invention comprises a flexible body 1 having the parallel cutting edges 2. At its center the blade is longer than at the edges forming projecting portions 3 which provide along the center line of the blade sufficient length for the slot 4 which is at least as long as the cutting edges 2. In line with the edges of the projecting portions 3 the body 1 is sheared or slotted as at 6 and the shears or slots 6 extend inwardly of the body 1 for a substantial distance. The shears 6 are so placed that when the blade is assembled with a holder the holder will clamp the blade along the cutting edge portions outwardly of the shears 6 so that the portions of the blades lying between the shears 6 and the slot 4 are not rigidly held by the holder.

The shears or slots 6 separate the edge portions from the remainder of the blade for a part of the length of the edge portions at each end thereof and free the portions 8 of the body of the blade at each end of the slot 4 to flex without transmitting undesirable stresses to the cutting edges. When the blade is clamped in a holder the portions 8 of the body of the blade and the projecting portions 3 form substantially U-shaped flexible hinge portions at each end of the blade which unite the cutting edge portions and permit of the distribution of the flexing strains throughout a considerable area within the limits of the cutting edges thus greatly reducing the liability of the blade to crack at the hinge portions. It also insures more perfect alinement of the cutting edges as the shears or slots 6 prevent distortion of the cutting edges by strains transmitted from the body of the blade.

In the modification shown in Figure 2 the blade 11 is provided with the cutting edges 12, the projecting portions 13 and the central slot 14 which is substantially the length of the cutting edges 12. Extending inwardly into the body of the blade 11 for a substantial distance and in line with the edges of the projecting portions 13 are the shears or slots 16 shown as gradually narrowing from the outer ends thereof. As in the modification shown in Figure 1, the shears or slots 16 free portions 18 of the body of the blade from the cutting edges and the portions 18 together with the projecting portions 13 form substantially U-shaped hinges which extend around the slot 14 and unite the cutting edges 12 of the blade. The structure of this modification permits the distribution of the strains of flexing over the large area of the hinges and prevents the transmission of strains to the cutting edges as described in connection with Figure 1.

In the modification shown in Figure 3 the blade 21 is provided with the cutting edges 22, the projecting portions 23 and the central slot 24, which is substantially as long as the cutting edges as are the slots 4 and 14 of Figs. 1 and 2. The blade 21 is also provided with the shears or slots 26 which extend into the body of the blade 21 in line with the edges of the projecting portions 23. It will be noted that the slot 24 differs in outline from the slots 4 and 14 but that despite the difference in slot outline the shears or slots 26 free the portions 28 of the body of the blade from the cutting edge portions and the portions 28 and the projecting portions 23 form U-shaped flexible hinge portions which unite the cutting edges of the blade and operate as do the U-shaped hinges described in connection with Figure 1.

In the modification shown in Figure 4, the blade 31 is provided with cutting edges 32 and a central slot 34 which is of less length than the cutting edges 32 so that the cutting edge portions are joined by end portions 33 of the blade body. Extending inwardly from the ends of the blade are the shears or slots 36 which separate the portions 38 of the body from the cutting edge portions so that the portions 38 and the end portions 33 form U-shaped flexible hinge portions uniting the cutting edge portions of the blade which operate as do the flexible hinge portions described in connection with Figure 1.

While central slots 4, 14, 24 and 34 of different lengths and having different outlines have been shown, it is to be understood that the invention is not limited to any particular length or

outline for the central slot so long as the shears or slots 6, 16, 26 and 36 divide the blade so that portions thereof form U-shaped flexible hinges extending around the ends of the central slots.

As shown in Fig. 5, a blade constructed in accordance with this invention when applied to safety razors of usual construction has its edge portions 1 bearing against the inner face of the cap 40 and against the fulcrum shoulders 42 of the guard 44 so that the edge portions are firmly clamped in the usual manner. The shears 6 of the blade, it will be noted, lie between the fulcrum shoulders 42 of the guard 44 so that the hinge portions 8, 3, 8, of the blade are not clamped between the cap and guard and the binding or flexing of the hinge portions is not restricted by the parts of the holder. The hinge portions 8, 3, 8, do not follow the contour of the cap 40 but assume a position intermediate the cap and guard in which the hinge portions are bent or curved to a much less degree.

I claim:—

1. A razor blade adapted to be flexed transversely by the clamping action of a holder and having two cutting edge portions separated longitudinally by a slot and shears extending inwardly from the blade ends and forming flexing hinge portions extending around the ends of said slot from zones inwardly of the ends of the cutting edges and inwardly of the zones where the blade is restrained by the holder fulcrums.

2. A razor blade adapted to be flexed transversely by the clamping action of a holder and having two cutting edge portions separated longitudinally by a slot and shears extending inwardly beyond the ends of the cutting edges and forming U-shaped flexing hinge portions extending around the ends of said slot, the side and end portions of said hinges being positioned inwardly of the zones of the holder fulcrums and free to flex when said blade is clamped in a holder.

3. A razor blade adapted to be flexed transversely by the clamping action of a holder and having two cutting edge portions separated longitudinally by a slot and connected by hinges having flexing side portions extending longitudinally of said blade and inwardly of the ends of the cutting edges between the zones of the holder fulcrums.

4. A razor blade adapted to be flexed transversely by the clamping action of a holder and having two cutting edge portions separated longitudinally by a slot and connected by U-shaped flexing hinge portions having regions of flexure extending between the cutting edge portions and the slot, said hinge portions being positioned so as to be free of restraint by a holder.

5. A razor blade adapted to be flexed transversely by the clamping action of a holder and having two cutting edge portions separated longitudinally by a slot extending the length of the cutting edges and connected by flexing hinge portions having parallel side portions forming regions of flexure extending between the blade edges and the slot, said side portions being positioned to lie between the holder fulcrums when the blade is clamped in a holder.

6. A razor blade adapted to be flexed transversely by the clamping action of a holder and having two cutting edge portions separated longitudinally by a slot extending the length of the cutting edges and connected by U-shaped flexing hinge portions extending around the ends of said slot and having parallel side portions forming regions of flexure extending between the blade edges and the slot, said side portions being positioned to lie between the holder fulcrums when the blade is clamped in a holder.

7. A razor blade having two cutting edge portions separated longitudinally by a slot and connected by U-shaped hinges having side portions extending longitudinally of the blade and inwardly of the ends of the cutting edges, said hinges being free to flex throughout in use.

8. A razor blade having two cutting edge portions separated longitudinally by a slot and connected by U-shaped hinges, said hinges having the major portion thereof extending parallel to the cutting edges and inwardly of the ends thereof.

JOSEPH E. McWILLIAMS.