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SAFETY RAZOR BLADE HAVING AN INTERNALLY SHARPENED EDGE AND EXTERNALLY BLUNT EDGES

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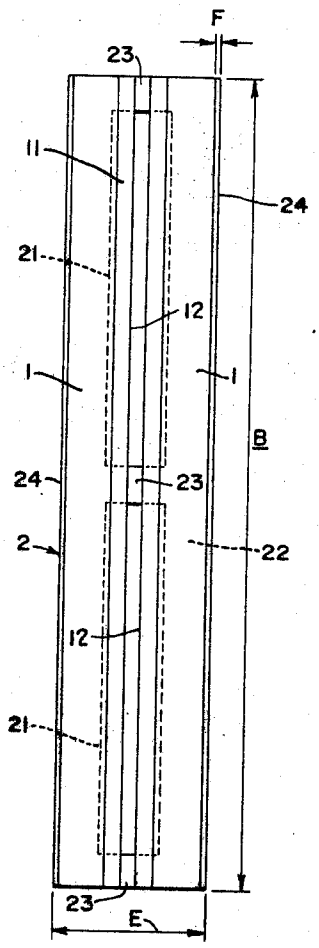

FIG. 1

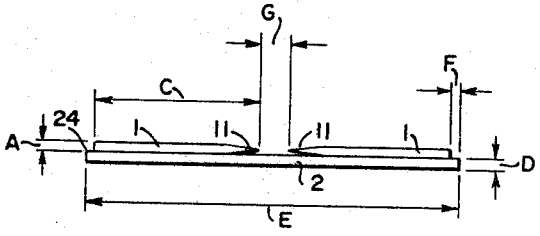

FIG. 2

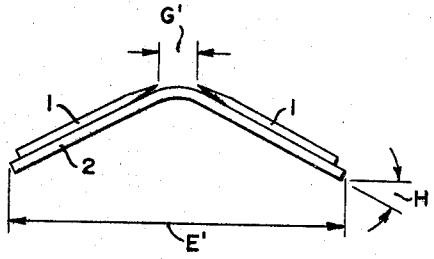

FIG. 3

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SAFETY RAZOR BLADE HAVING AN INTERNALLY SHARPENED EDGE AND EXTERNALLY BLUNT EDGES

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ABSTRACT OF THE DISCLOSURE

A safety razor blade having two blade portions disposed parallel to each other but separated from each other and interconnected, the blade portions and interconnecting means forming a slot centrally of the blade. A cutting edge defines at least one of the longitudinal sides of the slot. The edges of the blade portions parallel to the slot but removed therefrom comprise non-cutting surfaces, whereby to provide a razor blade having no cutting edges on its periphery.

This invention relates to blades for safety razors. While much time and effort has been expended in attempts to reduce the risk of cutting the face while shaving, that is to making razor blades safe during use and while in position in the razor, little or no attempt has been made to make such blades safe in themselves. Before insertion into the razor and after removal therefrom, the blades now commonly used and the very many alternative forms of safety razor blade which have been suggested possess extremely sharp cutting edges which are more or less openly exposed and are capable of inflicting severe cuts if carelessly handled, for example by children.

The general object of the present invention is to provide a razor blade which while giving a shave at least as close and as safe as existing blades, will have greatly enhanced safety when out of the razor.

A safety razor blade in accordance with the preferred form of the present invention comprises two blade strips of steel, each having one only of its longitudinally extending edges sharpened, and resiliently flexible coupling means securing the blade strips together with their sharpened edges parallel to and closely adjacent one another, said coupling means when unstressed holding the strips in a common plane, but permitting the two blade strips to be displaced angularly relative to one another while parallelism of their sharpened edges is maintained.

For use in shaving, this blade is held in the razor with the coupling means flexed, so that the two sharpened steel strips lie in planes at an angle of some 130° to one another, thus allowing the blade to be applied against the skin with each cutting edge inclined at an angle of some 25° to the skin. Shaving is effected by moving the blade both backwards and forwards over the skin in a direction generally perpendicular to the cutting edges, each blade strip in turn effecting the shaving action, while the other blade strip forms a safety guard. To allow easy entry of hairs into the gap between the blade strips, this gap should have a width of not less than about 0.015" and to enable the cutting edges to act as efficient guards for one another and give increased safety over conventional safety razors, the width of the gap should not exceed about 0.045", the upper limit being dependent on the "exposure" of the cutting edges, that is the extent to which they project beyond the adjacent parts of the razor in which they are used, or the extent to which those parts project beyond the cutting edges. Preferably, the

width of the gap is about 0.030". When separate from the razor before use, the resilient coupling means between the blade strips holds the blade flat, the two blade strips lying in a common plane with their cutting edges directly facing one another and separated only by a very narrow gap. As explained below, this gap may be even narrower than the gap which desirably exists between the cutting edges during shaving. Such a blade is inherently very safe and the risk that cuts will be inflicted by careless handling of the blade is very greatly reduced.

While it is preferred to provide the blade with two opposed cutting edges, each serving to guard the other both during shaving and when the blade is out of the razor, it is possible to use only a single cutting edge, guarded by the unsharpened edge of a strip of any suitable material. The invention accordingly includes also a modification of the safety razor blade described above in which one of the blade strips is replaced by a guard strip having no sharpened edge. Such a blade has the same inherent safety as the double edge blade and may be mounted in the razor and used in the same way as the double edged blade, except that shaving is effected by moving the blade in one direction only. Alternatively, the razor construction may be such that when the blade is mounted in the razor the guard strip is enclosed within the shoulders of the razor and forms no part of the skin supporting system. The invention is further described below with reference primarily to double edged blades, but with the obvious necessary modifications this description applies also to single edged blades in which one of the blade strips is replaced by an unsharpened guard strip.

The coupling means between the blade strips may be constituted by two or more narrow strips of resiliently flexible sheet material, these coupling strips lying in a plane parallel to that of the sharpened blade strips and extending generally perpendicular to those strips, each of the coupling strips being secured at its opposite ends to the two blade strips respectively. The coupling strips also may be made of hardened steel and spot welded or otherwise joined to the blade strips. Alternatively, they may be made of a suitable synthetic resin plastics material and cemented or otherwise adhesively secured to the blade strips. In a single edged blade, having one blade strip replaced by an unsharpened guard strip, the coupling strips may be made integral with the guard strip. If the blade strips, or the coupling strips, or both, are relatively stiff (for example, blades of the usual length of about 1½" formed from steel having a thickness of about 0.010" and spring steel coupling strips) it may be sufficient to provide two coupling strips, one at each end of the blade strips. With more flexible blade strips (for example strips of the same length formed from steel 0.004" thick) and for more flexible coupling strips of plastics materials, the provision of only two coupling strips would invlove some risk that the cutting edges would accidentally touch and damage one another. In such a case it is preferable to provide a third coupling strip at the centre of the length of the cutting edges. More than three coupling strips may be provided if desired.

Particularly when only two coupling strips are employed at the ends of the cutting edges, the coupling strips may be disposed on that side of the blade strips which is presented to the face in shaving, but preferably the coupling strips are disposed on the reverse face of the blade strips. This latter arrangement not only leaves the cutting edges entirely unobstructed by the coupling strips, but also has the effect that the flexing of the blade into shaving position causes the cutting edges to move further apart from one another, so that when the blade is in the flat condition, the gap left between the cutting edges can be even smaller than it is during shaving.

One particular form of blade in accordance with the invention is shown by way of example in the accompanying drawing, in which:

FIGURE 1 is a plan view of the blade;

FIGURE 2 is an end view thereof on a larger scale, and

FIGURE 3 is a view corresponding to FIGURE 2 but showing the blade in the flexed condition which it assumes when in position in a suitable razor (not illustrated).

In the blade illustrated, the two blade strips **1** are formed from steel 0.004" in thickness (dimension A) and each strip has a length (dimension B) of about 1½" and a wide (dimension C) slightly less than ⅛". Along one of its longer edges **11**, the strip is sharpened to a cutting edge **12**, the remaining edges of the strip being blunt. These blade strips are secured on a backing member **2** cut from a resiliently flexible plastics film. A suitable plastics material for the backing member is Du Pont "Mylar" (trademark) polyester film having a thickness (dimension D) of about 0.005". The backing member has a length (dimension B) equal to that of the blade strips and a width (dimension E) of about 0.275", which is slightly greater than the combined width of the blade strips (including the gap between their cutting edges), so that the longitudinal margins **24** of the backing member project slightly beyond the unsharpened longitudinal edges of the blade strips, the width of each projection (dimension F) being about 0.010". The backing member is formed along its longitudinal centre line with two rectangular openings **21** measuring about ⅝" by 1/16", thus giving the backing member the form of a frame comprising two longitudinally extending side strips **22**, (each about 1½" in length and 3/32" in width) disposed parallel to one another with a gap about 1/16" wide between their longer edges, these longitudinal strips being joined together by three integral transverse coupling strips **23**, each about 1/16" wide, extending across the gap. Each blade strip **1** is cemented to one of the longitudinal side strips **22** of the frame, the two blade strips being on the same face of the backing member, with their sharpened edges **12** overlying the openings in the frame and spaced apart from one another by a gap having a width (dimension G) of about 0.025". A suitable cement for securing the blade strips to the backing member is Du Pont polyester adhesive 46960.

For use in shaving the blade is inserted into a razor (not illustrated) which constrains the blade to assume the form shown in FIGURE 3. The planes of the two blade strips are then inclined to one another at an angle of about 126°, so that when the blade is applied symmetrically to the face, each blade strip is inclined to the skin at an angle H of about 27°. The overall width of the blade is reduced by the flexure and is slightly further reduced by compressive force applied by the razor to the projecting margins **24** of the backing member, the final width (dimension E') being about 0.250". With the blade thus flexed and compressed, the width of the gap between the cutting edges (dimension G') is about 0.030".

In another particular embodiment of the present invention (not illustrated) the blade strips are identical with those of the embodiment illustrated, but the plastics backing member **2** is omitted and the blade strips are secured together in the required coplanar, spaced parallel relationship by strips of spring steel about 0.002" thick, each about ¼" in length and about 1/16" in width. Each of these coupling strips extends transversely to the length of the blade strips and is spot welded near its two ends to the two blade strips respectively, all the coupling strips being on the same face of the blade strips. One coupling strip is arranged at, or close to, each end of the blade strips and a third coupling strip may be arranged at the centre of the length of the blade strips.

I claim:

1. A safety razor blade comprising first and second elongated planar blade portions, means adjacent to and flexibly interconnecting said blade portions intermediate the ends thereof, said blade portions being disposed parallel to each other, said blade portions and said interconnecting means defining a slot extending longitudinally between said first and second blade portions, a cutting edge comprising a longitudinal side of said slot, a first non-cutting surface comprising a peripheral edge of said first blade portion parallel to and substantially coextensive with said slot but removed from said slot, and a second non-cutting surface comprising a peripheral edge of said second blade portion parallel to and substantially coextensive with said slot but removed from said slot.

2. A blade in accordance with claim **1** in which the width of said slot is about 0.010 inch to 0.040 inch.

3. A blade in accordance with claim **2** in which at least on of said blade portions is of steel and has a thickness of about 0.002 inch to 0.010 inch and a width of about 0.100 inch to 0.150 inch.

4. A safety razor blade comprising two blade strips of steel, each of said strips having one only of its longitudinally extending edges sharpened, and resiliently flexible coupling means securing the blade strips together with their sharpened edges parallel to and closely adjacent one another, said coupling means comprising at least two narrow strips of resiliently flexible sheet material, said coupling strips when unstressed lying in a common plane parallel to the plane of the blade strips and extending transversely to the blade strips, said coupling strips being disposed adjacent each end of the blade strips and at an intermediate position, said coupling strips permitting the two blade strips to be displaced angularly relative to one another while parallelism of their sharpened edges is maintained.

5. A blade in accordance with claim **4** in which the coupling strips comprise integral portions of a sheet material backing member having a width exceeding the combined width of the blade strips and having a length substantially equal to the length of the blade strips, the longitudinal margins of the backing member projecting slightly beyond the unsharpened longitudinal edges of the blade strips, the backing member being apertured along its longitudinal center line so as to leave two longitudinally extending marginal strips, said marginal strips being adhesively secured to the blade strips, and said transversely extending coupling strips interconnecting said marginal strips.

6. A blade in accordance with claim **4** in which the blade strips and coupling means are so disposed that when the blade strips are displaced such that the blade strips lie in planes inclined to one another at an angle of about 120°–130°, the width of a gap between the adjacent sharpened edges of the blade strips is in the range of about 0.015 inch to 0.045 inch.

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