

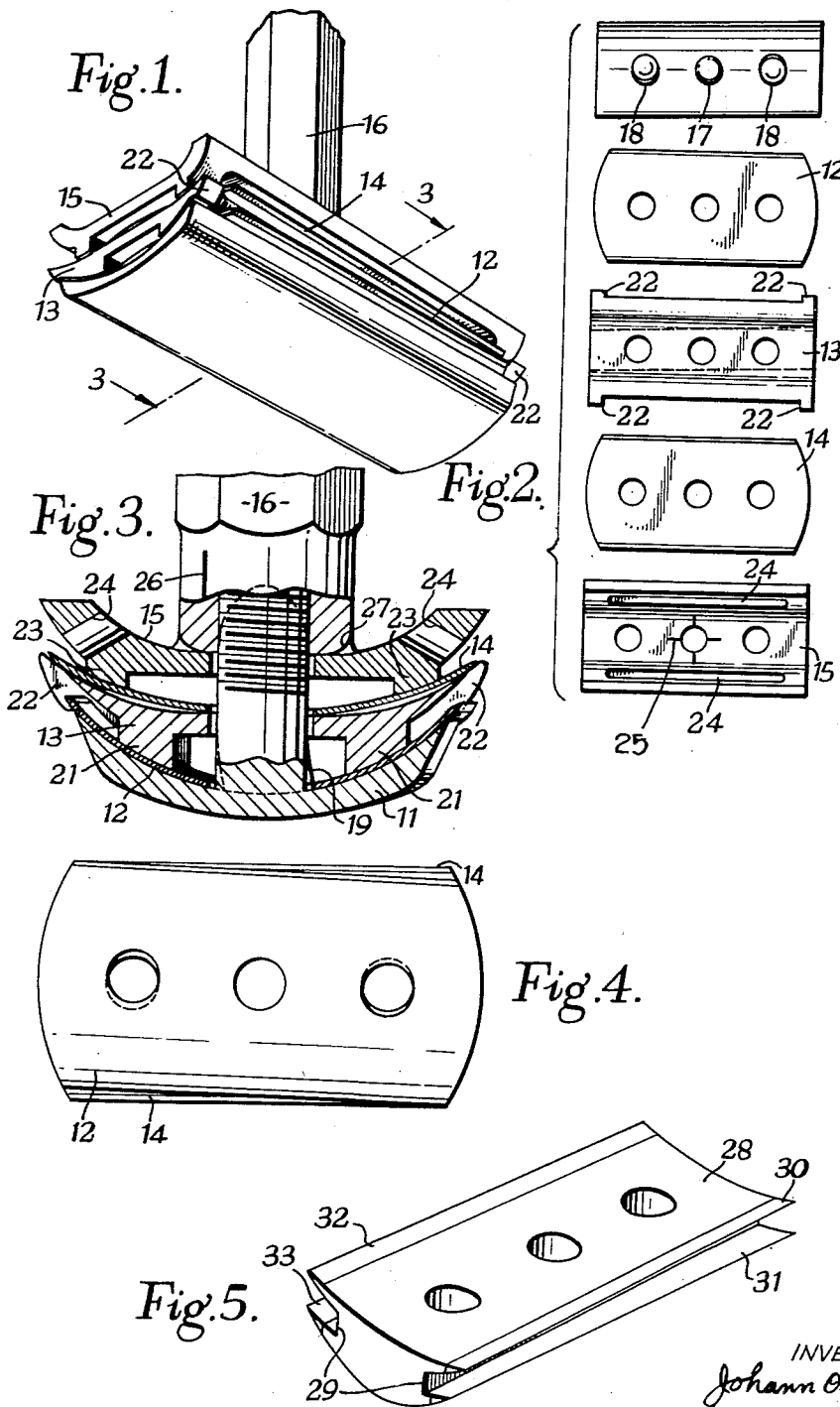
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SAFETY RAZORS

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SAFETY RAZORS

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The present invention relates to improvements in safety razors and is concerned with safety razors of the kind comprising a base clamping plate, an intermediate plate, a top plate and clamping means for clamping the plates together in the order given, the arrangement being such that when cutting members are included to form a razor assembly the cutting members are spaced apart to provide one pair of spaced cutting edges on one side of the razor assembly and lying outwardly of the intermediate plate and another pair of spaced cutting edges on the other side of the razor assembly and lying outwardly of the said intermediate plate.

The cutting members may be two double-edged razor blades of standard pattern, one blade assembled between the base clamping plate and the intermediate plate and the other blade assembled between the top plate and the said intermediate plate, one pair of cutting edges on the one side of the razor assembly being formed by two cutting edges of the two blades respectively, and the other pair of cutting edges on the other side of the razor assembly being formed by the other two cutting edges of the two blades respectively.

Alternatively the cutting members may be two pairs of knives mounted on the intermediate plate, one pair of knives being mounted on one side of the intermediate plate in the two surfaces respectively of the said intermediate plate to form one pair of cutting edges of the razor assembly, and the other pair of knives being mounted on the other side of the intermediate plate in the two surfaces respectively of the said intermediate plate to form the other pair of cutting edges of the razor assembly.

An object of the present invention is to provide an improved razor of the kind specified by which hairs on a skin surface may be more efficiently shaved due to one or both cutting edges of each pair of cutting edges operating with a draw-cut planing action.

According to the present invention, in a razor of the kind specified, the cutting edges of a least one pair of cutting edges take up positions, when the razor assembly is clamped, in which they are angularly displaced relatively to one another.

According to a feature of the invention, in a razor of the kind specified, the cutting edges of at least one pair of cutting edges take up positions, when the razor assembly is clamped, in which the projections of the cutting edges on to a plane perpendicular to the central axis of the razor are angularly displaced relatively to one another. If the cutting members are razor blades of the conventional pattern, the angular displacement may be achieved by providing on the base clamping plate, locating pins which have short inclined portions in the region of their junctions with the said base clamping plate, the inclined portions being oppositely directed towards the sides of the base clamping plate so as to cause a slewing action on the blade assembled between the base clamping plate and the intermediate plate to slew the latter blade

round as the razor assembly is clamped. If the cutting members are four knives mounted on the intermediate plate as hereinbefore described then the knives of at least one pair of knives may be mounted on the intermediate plate so that the projections of the two cutting edges on to the plane perpendicular to the central axis of the razor are angularly displaced relatively to one another.

According to a second feature of the invention, in a razor of the kind specified, the cutting edges of at least one pair of cutting edges take up positions, when the razor assembly is clamped, in which the projections of the two cutting edges on to a plane passing through the central axis of the razor and substantially parallel to one of the pair of cutting edges, are angularly displaced relatively to one another. If the cutting members are two double-edged razor blades, this angular displacement may be achieved by providing an intermediate plate which is itself thicker at one end of the plate than the other end or which carries projections which are thicker at one end of the plate than at the other end. If the cutting members are knives mounted on the intermediate plate, this angular displacement may be obtained by mounting the knives so that projections of the cutting edges on to the said plane through the central axis of the razor are angularly displaced relatively to one another.

According to a further feature of the invention, in a razor of the kind specified, the cutting members of at least one pair of cutting edges in the region of the cutting edges lie in planes which intersect the two planes parallel to the central axis and passing through the two cutting edges at different cutting angles. If the cutting members are razor blades of the conventional pattern, different cutting angles of the pair of cutting edges may be achieved by providing plates which are shaped in such a manner that, when the razor is clamped, the blades are bent in the same direction with different lateral curvatures. If the cutting members are knives mounted on the intermediate plate, the knives of one or both pairs of knives may be mounted also in such a manner that different cutting angles are obtained.

It may be preferred that, in the clamped razor assembly, the projections of the cutting edges of at least one pair of cutting edges on to the plane perpendicular to the central axis do not intersect. If the cutting members are razor blades, it may be preferred that the projections of two diametrically opposite corners of one of the blades coincide approximately with points on the two cutting edges respectively of the other blade.

The invention will now be described, by way of example, with reference to the accompanying drawing in which:

Figure 1 is a perspective view of a razor assembly with blades clamped in position, ready for use,

Figure 2 shows, to a smaller scale, a plan view from above of each component part of the razor shown in Figure 1,

Figure 3 shows a cross-sectional view of this razor taken on the line 3—3 in Figure 1, and

Figure 4 is a plan view showing the relative positions of the two blades as viewed from below in Figure 1.

Figure 5 shows an intermediate plate of a razor assembly according to a second embodiment of the invention.

The assembly of Figure 1 comprises a base clamping plate 11 of curved cross-section, a first blade 12, an intermediate plate 13 of curved cross-section, a second blade 14, a top plate 15 also of curved cross-section and a handle 16.

The base clamping plate 11 is provided with a central screw pin 17 and two locating pins 18 as shown in Figure 2. The locating pins 18 each have short inclined portions 19 (Fig. 3) in the region of their junctions with

the base clamping plate 11, the inclinations of one inclined portion 19 being directed towards one longitudinal edge of the base clamping plate 11 and the other inclined portion 19 being directed towards the other longitudinal edge of the said plate 11. The straight portions of the locating pins 18 have centres lying on a line which passes through the centre of the central screw pin 17 and is perpendicular to the ends of the base clamping plate 11. The centres of the bases of the locating pins 18, by reason of the inclined portions 19, lie on a line which passes through the centre of the central screw pin 17 and which is inclined at a small angle to the line of centres of the straight portions. The longitudinal edges of the base clamping plate 11 are formed parallel to the line of centres of the bases of the locating pins 18.

By reason of the inclined portions 19, the first blade 12 in taking up its clamped position is angularly displaced relative to the second blade, the displacement being such that the edges of the first blade 12 in its clamped position lie parallel to the longitudinal edges of the base clamping plate 11.

The intermediate plate 13 has surfaces which, by reason of their different lateral curvatures, converge to form parallel longitudinal edges. One surface of the plate 13 is formed with ribs 21 extending along the length of the plate and inclined at a small angle to the longitudinal edges thereof. The ribs 21 also taper along their length from substantial ribs at one end of the plate 13 to shallow ribs at the other end of the plate 13. These ribs 21 give a lateral curvature to the first blade 12 when the razor is assembled and clamped. The intermediate plate has a set of three holes for receiving the central screw pin 17 and the locating pins 18 of the base clamping plate 11, the centres of these holes lying along a line through the middle of the plate parallel to its longitudinal edges. The plate is also provided with lugs 22 formed at each corner thereof to prevent the corners of the blades in the assembled razor from cutting or scratching the surface to be shaved.

The top plate 15 has parallel longitudinal edges. One surface of the top plate 15 is provided with uniform ribs 23 extending along the length of the plate parallel to its edges. The ribs 23 give the lateral curvature to the second blade when the razor is assembled. The top plate 15 is also provided with slots 24 which extend along the plate parallel to its edges. A set of three holes for receiving the pins of the base clamping plate 11 are formed in the top plate 15, the centres of the holes lying along a line through the middle of the top plate 15 and parallel to its longitudinal edges.

The handle 16 is counterbored and internally threaded at one end to receive the central screw pin 17, and this end of the handle is formed with a convex end surface 27.

In assembling the razor shown in Figure 1, the pins of the base clamping plate 11 are passed through sets of registering holes in the other component parts of the assembly, and the handle 16 is screwed on to the screw pin 17, the end surface 27 of the handle 16 engaging with the top plate 15, whereby the component parts are drawn together into the positions shown in Figure 1. The convex end surface 27 ensures that the handle 16 does not interfere with the freedom of the top plate 15 to tilt with respect to the base clamping plate 11.

By reason of the inclined portions 19 of the locating pins 18, the first blade is angularly displaced relative to the second blade, and by reason of the tapering ribs 21 on the intermediate plate 13 the two blades take up positions inclined to each other.

The cutting angles of the blades are determined by their lateral curvatures when the blades are assembled. By a screw adjustment of the handle 16, the extent to which the blades are bent can be varied, whereby different cutting angles can be obtained. The provision of marks 25 on the top plate 15 and a coincidence mark

26 on the handle 16 facilitates the adjustment of the cutting angles of the blades to any required value.

It is to be understood that the apparatus is equally well adapted for use with blades of different widths, lengths or thicknesses.

In a second embodiment of the invention, the two blades 12, 14 and the intermediate plate 13 are substituted by an intermediate plate of the kind shown in Figure 5. The intermediate plate 28 is in the form of a rectangular plate of curved cross-section and has a set of three holes for receiving a central screw pin and two straight locating pins of a base clamping plate, the centres of these holes lying along a line through the middle of the plate parallel to the longitudinal edges of the said plate. The longitudinal edges of the intermediate plate 28 are formed with recesses 29. Four knives 30, 31, 32 and 33 are mounted on four projections respectively, formed by recessing the longitudinal edges of the plate 28. The knives 30, 32 are mounted and shaped in such a manner that their edges lie parallel to the line through the centres of the three holes in the plate.

The knives 31, 33 are mounted and shaped in such a manner that the projections of their cutting edges on to the plane perpendicular to the line through the centre hole in the plate are equally angularly displaced from the projections respectively of the cutting edges of the knives 30, 32. The intermediate plate 28 is made thicker at one end of the plate than at the other end, so that when the knives are mounted the projections of the cutting edges 31 and 33 on to a plane through the central axis of the intermediate plate and through the line of centres of the registering holes, are equally angularly displaced from the projections respectively of the cutting edges of the knives 30 and 32. In addition, the knives 30, 32 are mounted so that the cutting angles of the knives 30, 32 are greater than the cutting angles of the knives 31, 33.

I claim:

1. A safety razor comprising a base clamping plate, an intermediate plate, cutting members comprising two double-edged blades, a top plate, and clamping means for clamping the plates and blades together to form a razor assembly, one blade being assembled between the base clamping plate and the intermediate plate and the other blade assembled between the top plate and the intermediate plate, one pair of cutting edges on one side of the razor assembly being formed by two cutting edges of the two blades respectively, and the other pair of cutting edges on the other side of the razor assembly being formed by the other two edges of the two blades, the cutting edges of at least one pair of cutting edges taking up positions, when the razor assembly is clamped, in which the projections of the cutting edges of the said pair of cutting edges on to a plane perpendicular to the central axis of the razor are angularly displaced relatively to one another, and said base clamping plate being provided with locating pins having short inclined portions in the regions of their junctions with the said base clamping plate, the locating pins being adapted to be inserted in registering holes in the razor assembly and the inclined portions being oppositely directed towards the sides of said base clamping plate so as to cause a slewing action on the blade assembled between the base clamping plate and the intermediate plate to slew the latter blade round as the razor assembly is clamped.

2. A safety razor comprising a base clamping plate, an intermediate plate, cutting members comprising two double-edged blades, a top plate, and clamping means for clamping the plates and blades together to form a razor assembly, one blade being assembled between the base clamping plate and the intermediate plate and the other blade assembled between the top plate and the said intermediate plate, one pair of cutting edges on one side of the razor assembly being formed by two cutting edges of the two blades respectively and the

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other pair of cutting edges on the other side of the razor assembly being formed by the other two edges of the two blades respectively, and wherein the intermediate plate tapers from a thick cross-section at one end to a thin cross-section at the other end, whereby, in the assembled and clamped razor, the blades take up positions in which their edges are more widely spaced at one end than at the other end, the cutting edges of at least one pair of cutting edges taking up positions, when the razor assembly is clamped, in which the projections of the cutting edges of the said pair of cutting edges on to a plane passing through the central axis of the razor and substantially parallel to one cutting edge of the said pair of cutting edges are angularly displaced relatively to one another, the said clamping means comprising a handle adapted to engage with a screw-threaded member

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on the base clamping plate and a clamping surface engaging with the top plate to cause clamping pressure to be applied to the blades and to the intermediate plate, the clamping surface being a convex curved surface so that when the clamping pressure is applied, the handle allows the top plate to tilt with respect to the base clamping plate.

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