Sept. 18, 1951 H. C. ANDERSON 2,568,047

SAFETY RAZOR

Filed Sept. 30, 1948

Fig. 1.

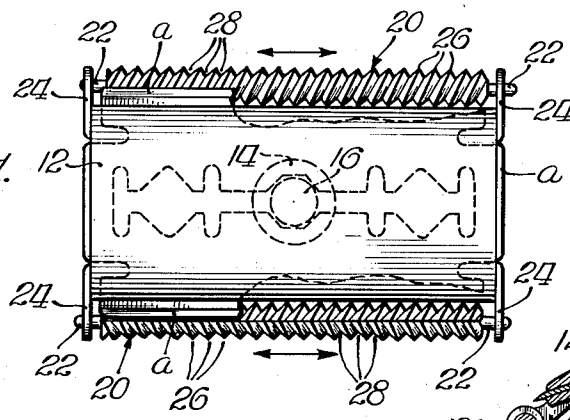

Fig. 4.

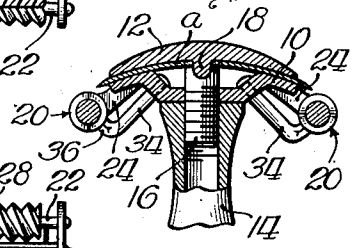

Fig. 2.

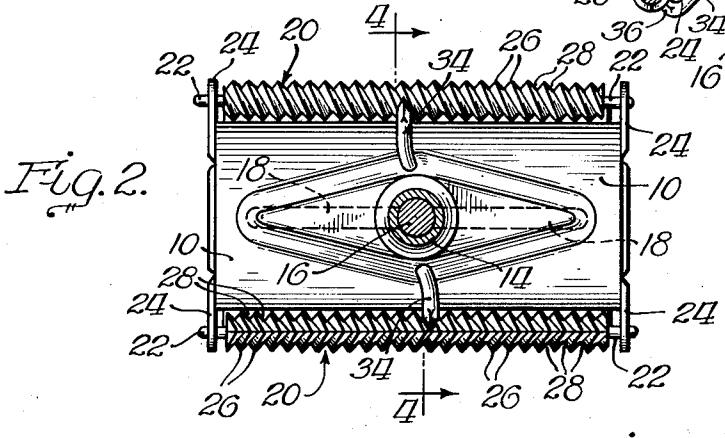

Fig. 3.

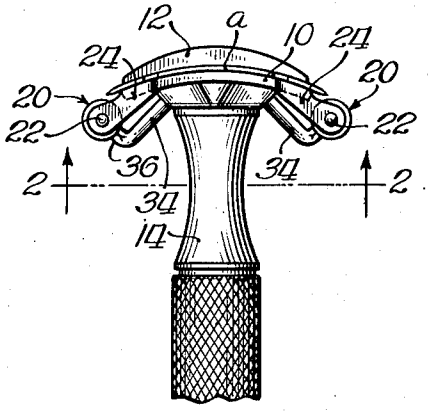

Fig. 5.

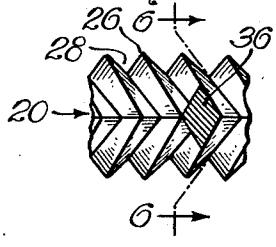

Fig. 6.

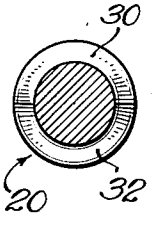

Fig. 7.

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SAFETY RAZOR

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5 Claims. (Cl. 30—34)

1

The invention relates to safety razors.

One object of the invention is to provide an improved safety razor which includes a guard-roller mounted to travel in advance of the cutting edge of a razor-blade, which will be rotated by frictional contact with the skin and will move the bristles or urge the skin longitudinally of the cutting edge of the blade during the normal cutting strokes applied to the razor. This movement of the bristles by the guard-roller results in the close cutting or clean shaving desired.

Another object of the invention is to provide a razor with a guard-roller for the movement of the bristles or urging the skin longitudinally of the cutting edge of the blade during strokes manually imparted to the razor, which is simple in construction and efficient in operation.

Other objects of the invention will appear from the detail description.

The invention consists in the several novel features hereinafter described, and more particularly defined by claims at the conclusion hereof.

In the drawings—

Fig. 1 is an inverted plan of a razor embodying the invention, a portion of the razor-blade being broken away for illustrative purposes;

Fig. 2 is a section taken on line 2—2 of Fig. 3;

Fig. 3 is a side elevation;

Fig. 4 is a section taken on line 4—4 of Fig. 2;

Fig. 5 is a detail, upon an enlarged scale, of a portion of the guard-roller;

Fig. 6 is a section taken on line 6—6 of Fig. 5; and

Fig. 7 is a detail of the end of one of the abutments engaging the guard-roller for effecting its axial reciprocation.

The invention is exemplified in a safety razor which comprises a head 10, which is usually provided with a cylindrically convex face and a double-edged razor-blade *a* which is secured on the head by a clamping member 12. A handle 14 is screw-threaded to a stem 16 on the clamping member 12 for detachably clamping together member 12, blade *a*, head 10, and handle 14, as well understood in the art. Clamping member 12 is usually provided with a rib 18 which extends through a slot in the blade *a* and into a recess in the head 10 for longitudinally aligning the edges of the clamping member, the blade, and head, as well understood in the art. These parts exemplify a holder in which a double-edged razor-blade is stationarily clamped while shaving.

A guard-roller generally designated 20 is provided to travel in advance of each of the cutting

2

edges of the blade of the razor, and its axis extends longitudinally of, and parallel to, said cutting edge. Each roller 20 is provided with trunnions 22 at its ends, which are rotatable and longitudinally slidable in ears or lugs 24, which are fixed to, or integral with, the head 10 outwardly of the ends of the blade. Ears or lugs 24 are spaced from the ends of the guard-roller to permit limited axial movement of the roller. Each roller 20 is provided on its periphery with a series of annular ribs 26 and intermediate annular grooves 28. These ribs are parallel to one another and are substantially V-shaped in cross-section. These ribs, when the roller is pressed against the skin, cause the roller to rotate on its axis during cutting strokes of the razor. Each rib 26 extends circumferentially around the roller and substantially one-half of its circumference is inclined longitudinally in one direction of the axis of the roller or has a pitch angle of substantially from 15° to 30°, and the other half 32 of its circumference is oppositely inclined longitudinally of the axis of the roller or has a reverse pitch angle of the same degree. Each roller 20, while it is rotating by contact with the skin during a cutting stroke, is shifted axially or longitudinally of the edge of the blade by an abutment 34 which is fixed to, and rigid with, the head 10 and has a pyramidal terminal 36 which extends into one of the annular grooves 28 adjacent the longitudinal center of the roller 20. The terminal 36 of abutment 34, during rotation of roller 20, is successively and alternately engaged by the circumferential sections 30, 32 of opposite pitch of the contiguous ribs 26, so that, during the rotation of the roller, it will be bodily reciprocated axially and longitudinally of the cutting edge of the blade. This results in a combined rotary and reciprocatory movement of the roller which causes the circumferential portions of the ribs to alternately urge the skin or bristles on the skin back and forth along, and in close proximity with, the cutting edge of the blade, while the blade remains fixed in the holder. The inclination of the ribs 26 also tends to urge the skin and bristles toward the cutting edge of the blade. The circumferential portions of the reverse pitch angle and the bodily reciprocation of the roller contribute to these results. The ribs 26 extend continuously from end-to-end of rollers 20 and the abutments 34 are positioned so they will not interfere with the action of the ribs along the entire cutting edges of the blade.

During the strokes of the razor over the areas to be shaved, the guard-roller 20 will contact the

skin and bristles slightly in advance of, and along, the cutting edge of the blade. The frictional engagement of ribs 26 with the skin will cause the roller to rotate on its axis and relatively to the blade. Each abutment 34 fits between a pair of contiguous annular ribs 26 and in the intermediate groove 28, and the semi-circular portions of opposite pitch in these ribs and grooves which engage said abutment will cause the rotating guard-roller to reciprocate axially and longitudinally of the cutting edge of the blade. During this rotation and axial reciprocation of the guard-roller, due both to reciprocations and the semi-circular rib-portions 30, 32 of opposite pitch angles, the bristles and the skin will be pressed or urged back and forth, or alternately in the opposite directions along and toward the cutting edge of the blade. This action of the annular ribs results in clean and efficient shaving. In practice, it has been found that opposite pitch angles of substantially 15° to 30° in the ribs 26 and the reciprocations of the roller will manipulate the skin and bristles adjacent the cutting edge of the blade to effect exceptionally clean shaving while the blade remains fixedly held in the holder.

The invention exemplifies a safety razor which comprises a guard-roller which is rotatable by contact with the skin during the shaving strokes and is longitudinally reciprocated to move the bristles back and forth adjacent the cutting edge of the blade to more effectively and cleanly cut the bristles. A characteristic of the invention is that this result is achieved with the razor blade stationarily held in the holder, and no blade-moving load is imposed upon the guard-roller. The longitudinally slidable guard-roller and the stationary abutment on the head exemplify simple means for imparting reciprocatory longitudinal movement to the guard-roller during its rotation by frictional contact with the skin.

The invention is not to be understood as limited to the details described, since these may be modified within the scope of the appended claims without departing from the spirit and scope of the invention.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A combination with a safety razor comprising a razor blade and a holder in which the blade is stationarily secured; of a guard roller mounted on the holder for rotation and axial reciprocation in advance of the cutting edge of the blade and provided with ribs on its periphery each having circumferential sections of opposite helical pitch for urging the skin back and forth along said cutting edge during rotation of the roller, and means between the holder and the blade for axially reciprocating the roller during rotation of the roller, the helical pitch of the ribs and their axial movement acting cumulatively in urging the skin back and forth along the cutting edge of the blade.

2. A combination with a safety razor comprising a razor blade and a holder in which the blade is stationarily secured; of a guard roller mounted on the holder for rotation and axial reciprocation in advance of the cutting edge of the blade and provided with a continuous series of V-shaped ribs on its periphery each having circumferential sections of opposite pitch for urging the skin back and forth along said cutting edge during each revolution of the roller, and means between the holder and the blade for axially reciprocating the roller during rotation of the roller, the helical pitch of the ribs and their axial movement acting cumulatively in urging the skin back and forth along the cutting edge of the blade.

3. A combination with a safety razor comprising a razor blade and a holder in which the blade is stationarily secured; of a guard roller mounted on the holder for rotation and axial reciprocation in advance of the cutting edge of the blade, and provided with a continuous series of ribs on its periphery, each having substantially 180° circumferential sections of opposite pitch for urging the skin back and forth along said cutting edge during each revolution of the roller, and means between the holder and the blade for axially reciprocating the roller during rotation of the roller, the helical pitch of the ribs and their axial movement acting cumulatively in urging the skin back and forth along the cutting edge of the blade.

4. A combination with a safety razor comprising a razor blade and a holder in which the blade is stationarily secured; of a guard roller mounted on the holder for rotation and axial reciprocation in advance of the cutting edge of the blade and provided with a continuous series of V-shaped ribs on its periphery each having circumferential sections of opposite pitch for urging the skin back and forth along said cutting edge during each revolution of the roller, and an abutment on the holder extending between a contiguous pair of said ribs for axially reciprocating the roller during its rotation, the helical pitch of the ribs and their axial movement acting cumulatively in urging the skin back and forth along the cutting edge of the blade.

5. A combination with a safety razor comprising a razor blade and a holder in which the blade is stationarily secured; of a guard roller mounted on the holder for rotation and axial reciprocation in advance of the cutting edge of the blade and provided with continuous series of annular ribs on its periphery each having circumferential sections of opposite pitch of substantially 15° to 30° for urging the skin back and forth along said cutting edge during each revolution of the roller, and means between the holder and the blade for axially reciprocating the roller during rotation of the roller, the helical pitch of the ribs and their axial movement acting cumulatively in urging the skin back and forth along the cutting edge of the blade.

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