

R. P. HARSHBERGER,
SAFETY RAZOR.
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1,394,827.

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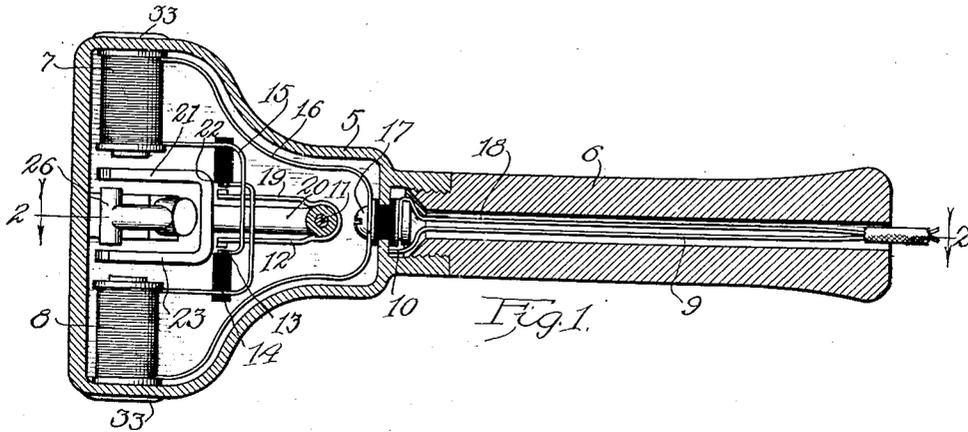


Fig. 1.

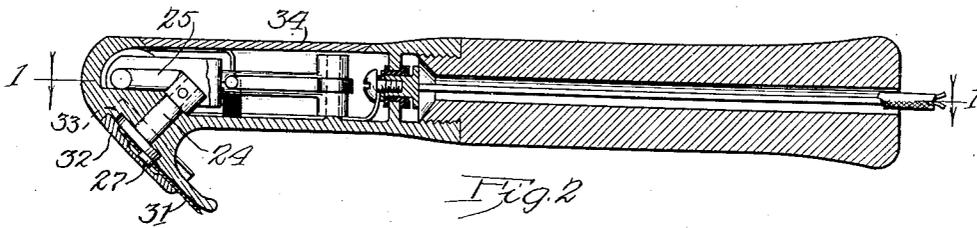


Fig. 2.

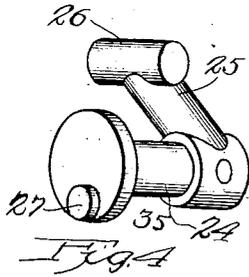


Fig. 4.

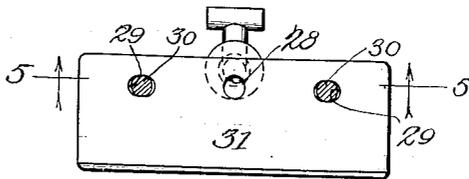


Fig. 3.

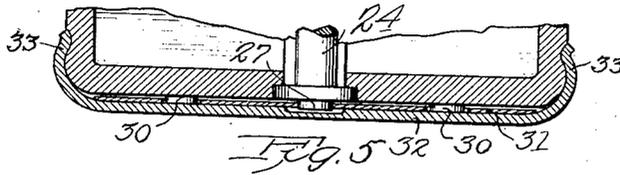


Fig. 5.

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UNITED STATES PATENT OFFICE.

RUSSELL P. HARSHBERGER, OF CHICAGO, ILLINOIS.

SAFETY-RAZOR.

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To all whom it may concern:

Be it known that I, RUSSELL P. HARSHBERGER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Safety-Razors, of which the following is a specification.

This invention relates to improvements in safety razors, and has for its object the production of a safety razor the blade of which is given a vibratory movement when in operation. Herein I have illustrated and described a razor with the blade set at an angle of about 45 degrees with the handle; but it is to be understood that the invention applies to blades set at any ordinary angle with the handle. A further object of the invention is to provide suitable mechanism for vibrating the blade and for protecting such mechanism against injury from dirt and moisture, and also for starting the vibrations of the blade in case any of the moving parts should by chance become set. Other objects will be apparent from a consideration of the drawings and the following description:

Of the drawings Figure 1 is a central longitudinal section of a razor embodying the features of my invention, the section being along the line 1—1 of Fig. 2. Fig. 2 is a section along the line 2—2 of Fig. 1. Fig. 3 is a detached view of the razor blade and the member connecting it with the operating mechanism. Fig. 4 is an enlarged perspective view of the connecting member. And Fig. 5 is an enlarged section along the line 5—5 of Fig. 3, showing also the face guard.

The blade of the razor is operated by electromagnets which in this illustration are inclosed in a casing and arranged so that the armature of the magnets strikes against a pivoted member which is thus vibrated, and the member is operatively connected with the blade and hence, imparts vibrations thereto. It is to be understood however, that any suitable vibrating means may be used in place of the electromagnets shown.

Referring to the drawings, a casing 5 is fixed to the handle 6, and incloses the electromagnets 7 and 8. The magnets are alternately energized by any suitable source of electric current, which passes through the following circuit to energize magnet 7: from any suitable source of supply, through wire 9, the casing 5 to which the wire 9 is

connected at the point 10, thence through pivot 11, and the pivoted end of the armature 20. The armature is freely revoluble about the pivot, and if held with its forks vertical as shown it will turn downwardly until the spring 12 comes in contact with contact pin 13 set in an insulation member 14. The current, in such an event, will then pass into contact pin 13, wire 15, the coil of magnet 7, wire 16, screw 17, and wire 18, which is fixed to the screw 17, and thence back to the source. When the magnet 7 is energized the branch 21 of the armature is pulled toward the magnet, contacts 12 and 13 are separated, and contacts 19 and 22 are closed; hence the armature is released by magnet 7, and magnet 8 being energized by a current flowing through the circuit corresponding to the circuit of magnet 7, the branch 23 is attracted thereto.

In this manner the armature is continuously vibrated, and the blade 31 is vibrated thereby in the following manner:

Journalled in the casing 5 is a rock pin 24 of the connecting member 35; fixed to the inner end of the pin is an arm 25; and mounted on the end of the arm 25 is a bumper 26 projecting between the branches of the armature. As the armature vibrates its branches alternately strike against the bumper 26 and thus rock the pin 24. The pin 24 projects out of the casing and has fixed to its outer end an eccentric 27 which projects through an opening 28 in the blade 31. The blade 31 is slidably mounted in the casing wall in any suitable manner, for example by means of the elongated openings 29 through which project the posts 30 which are fixed to the casing. By this arrangement it will be seen that as the pin 24 is rocked the blade 31 will be vibrated in a path parallel with the cutting edge of the blade.

The blade is held in position on the posts 30 by the guard 32 which is spaced from the frame by the posts and is held in place by the clips 33 fixed to the guard and normally clasping the end walls of the casing. In this way the blade moves freely between the guard and the frame.

In operation the electric circuit is closed by any suitable external means and by turning the razor so that the armature moves downwardly and closes the circuit at the contact 13 or 22. The electro-magnets are then alternately energized and deenergized;

the armature branches are thus caused to alternately strike against the bumper 26 causing it to vibrate and rock the pin 24; this, by oscillating the eccentric 27, causes the blade to be vibrated. The impacts of the armature branches acting alternately in opposite directions upon the bumper overcome any sticking tendency of the blade or of the connecting member 35 due to dirt or moisture, and insure relative movement of the blade and the beard of the operator.

If desired the casing may be entirely closed, and all dirt and moisture will thus be excluded from the operating mechanism. The rotary movement of the pin 24 journaled in the wall of the casing, and fitting snugly in its bearings, will not allow moisture or dirt to enter. The casing may be opened by means of a plate 34 detachably fixed in any suitable manner to the casing. Suitable adjusting means may be used to control the action of the mechanism if desired; and the weight of the armature, the strength of the magnets and the range of movement of the armature or the blade may be made to suit the needs.

Although I have described with much particularity the various details of the mechanism which I have provided in carrying out my invention, yet it is to be understood that various improvements therein may be made by those skilled in the art without departing from the spirit of my invention.

I claim as my invention:

1. In a safety razor a casing, a blade slidably mounted outside of said casing, a member journaled in the wall of said casing and having an eccentric portion operatively connected with said blade, and means in said casing for rocking said member.

2. A casing, a member slidably mounted outside of said casing, a pin journaled through the wall of said casing, an eccentric fixed to the outer end of said pin and being operatively connected with said member, a vibrator in said casing, and an arm on said

pin operatively associated with said vibrator.

3. A casing, a first member movably mounted outside of said casing, a second member passing through the wall of said casing, said second member having an eccentric on its outer end, said eccentric being operatively associated with said first member, and means in said casing for producing impacts on the inner end of said second member.

4. In a safety razor a frame, a handle fixed to said frame, a blade slidably mounted in said frame, a member rotatably journaled in said frame with its axis forming an oblique angle with said handle, an eccentric on said member operatively associated with said blade, a second eccentric on said member, and rocking means operatively associated with said second eccentric.

5. In a razor a closed casing, a handle fixed to said casing, a blade slidably mounted on said casing, a pin journaled in and extending through the wall of said casing at an oblique angle to said handle, an eccentric on the outer end of said pin cooperating with said blade, an arm on the inner end of said pin, and means for vibrating said arm.

6. In a razor a casing, a handle fixed to said casing, a blade slidably mounted on said casing, a pin journaled in the wall of said casing at an oblique angle with said handle, an eccentric fixed to said pin and cooperating with said blade, and means for rocking said pin.

7. In a safety razor a frame, a blade slidably mounted in said frame, a member mounted in said frame having an eccentric operatively connected with said blade, an arm fixed to said member and extending therefrom at an acute angle, and means for oscillating said arm.

In testimony whereof, I hereunto set my hand.

RUSSELL P. HARSHBERGER.