

Sept. 23, 1941.

D. F. SILVER

2,256,871

RAZOR

Filed July 1, 1939

Fig. 1

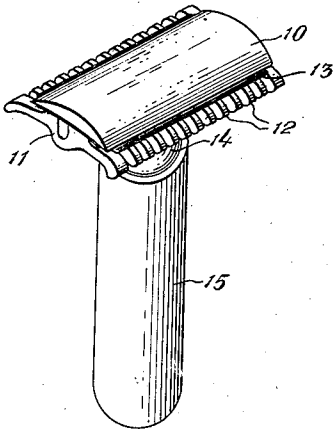


Fig. 2

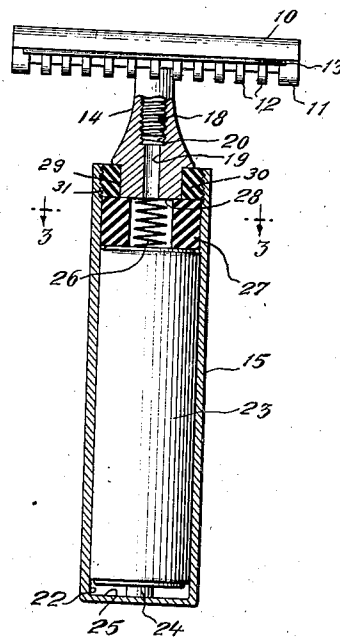
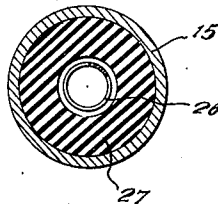


Fig. 3



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UNITED STATES PATENT OFFICE

2,256,871

RAZOR

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Application July 1, 1939, Serial No. 282,340

7 Claims. (Cl. 30—32)

This invention relates to improvements in razors, and more particularly to razors which make use of electric currents for increased efficiency.

The invention resides in the provision of a small battery or dry cell in the handle of the razor and suitable insulating means to confine the battery terminals to selected portions of the razor assembly. The handle which is held in the hand while shaving is connected to the positive battery terminal while the blade is connected to the negative terminal. A closed circuit is formed when the user holds the handle in one hand and presses the blade against the skin of his face, the path of the current being from the positive pole of the battery to the handle, through the body to the skin of the face, to the cutting blade, and the negative terminal of the battery.

It is a well known fact that the human skin is an ideal membrane, well suited to exhibit and illustrate the phenomena of osmosis. The laws and principles relating to osmosis may be found in any standard textbook on physics; therefore, they will not be presented here in detail. Briefly stated, when a porous membrane such as the skin, forms the dividing line between two dissimilar solutions, a double transfer will be effected; each solution traversing the membrane to mix with the other at a speed which depends upon the concentration and individual characteristics of the dissolved material.

It has been discovered that the application of an electric current, traversing the membrane from one solution to the other, greatly modifies the speed of transfer of the solutions through the membrane, in some cases, reducing the speed of transfer of one solution to almost zero and greatly increasing the flow of the other solution.

The conditions as outlined above are present when lather is applied to the face and current is caused to flow from the body to a metallic cutting edge. Moisture and body oils are continually being supplied to the razor's cutting edge through the skin, thereby providing the needed lubrication for a good shave.

One of the objects of the invention is to provide an improved razor utilizing the effects of electro-endosmosis for blade lubrication.

Another object of the invention is to provide a structure which will produce an electric current having as circuit elements the body of the user, the cutting element of a razor blade, and the handle of the razor.

Another object of the invention is to provide a structure consisting of a razor and a battery with provision for the generation of a current only when the structure is being used.

Still another object of the invention is to provide a razor combination which will lubricate the skin with the body oils, thereby resulting in superior shaving characteristics.

Other objects and structural details of the invention will be apparent from the following description when read in connection with the accompanying drawing.

In the drawing:

Fig. 1 is a perspective view of a safety razor constructed in accordance with the present invention;

Fig. 2 is a central vertical section taken through the handle portion of the razor, the head portion being shown in elevation;

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

The embodiment of the invention chosen for illustration in the drawing is a safety razor, although it will be appreciated that the invention may be applied to a straight razor or to an electric shaver, or, in fact, to any other cutting device.

The razor includes a blade cap 10, a base member 11 having spaced comb portions 12 along the marginal edges thereof, the members 10 and 11 being adapted to support a double edged blade 13 therebetween. The razor further includes a neck portion 14 removably positioned at the upper end of a tubular metallic handle 15 closed at its lower end. The neck portion is formed with a longitudinal aperture 19 having an enlarged threaded portion 20 at the upper end thereof which receives a threaded shank 18 which is secured to the guard 10 in any suitable manner. The base 11 and the cap 10 may be made from metal and when the metallic blade 13 is positioned therebetween, electrical current from the face of the user will pass to the cap and the blade and thence to shank 18 and into the neck portion 14. In some instances, however, it may be desirable to form the portions 10 and 11 from insulating material such as molded plastic, and in this instance a suitable electrode (not shown) will be positioned in the lower surface of the cap engaging the blade and the shank 18 in order to cause current to pass from the blade to such shank, which in the present arrangement must be formed of conductive material. The handle portion 15 is formed with a longitudinal bore 22 of such size as to receive a

conventional dry cell 23 having a low voltage of the order of one and one-half volts, the central or positive terminal 24 of such battery engaging the upper surface 25 of the lower end wall of the handle. The exterior of the cell is insulated, as is well known, and it will accordingly be apparent that current from the positive terminal of the battery will pass to the hand of the user. A coil spring 26 engages, at its lower end, a negative terminal of the battery, and at its upper end engages the lower surface 28 of the neck portion 14, such spring being positioned with a longitudinal aperture formed in a bushing 27 made from suitable insulating material, such bushing engaging the upper end of the battery at its lower end.

The neck portion 14 is formed with a reduced portion 29 at its lower end, such portion carrying a collar 30 made from suitable insulating material which is force fitted upon such portion 29, the external periphery of such collar 30 being threaded and adapted to engage internal threads 31 at the upper end of the handle.

It will be apparent from the foregoing that the positive pole of the battery makes electrical contact with the external surface of the metallic handle, which is held in the hand of the user during the shaving operation. Furthermore, the handle is insulated from the head or blade supporting portion and electrical contact is made between the negative pole of the battery and the blade positioned in the head of the razor. Accordingly, an open circuit is formed which is closed by contact between the handle and the blade, which contact is made through the body of the user by the handle being held in the hand of the user and the blade being in contact with the moisture-laden lather on the face of the user.

Thus, the skin and the water which is in contact therewith, acquire unlike charges resulting in a potential difference between them. One of the phases, namely the water, is free to move and it will migrate to an electrode under the influence of an electric field. The high dielectric constant of water results in its being positively charged when in contact with the skin and when contact is made through the handle to the body of the user, the blade, being negatively charged, attracts water and such blade is thus lubricated continuously by a very thin film of water. It will also be apparent that the air bubbles suspended in the lather migrate to the anode which in this instance is the skin, thus further assuring a moisture lubricated blade edge which tends to protect the skin from direct or intimate contact with the edge of the blade. This effect is continuous during the shaving operation and accordingly the film is being continuously replaced.

The foregoing embodiment of the invention, specifically described and claimed, is capable of considerable modification without departing from the spirit of the invention. For instance, a straight razor may be formed in substantially the same manner with a recess for the battery or the battery may be separate and apart from the razor, and suitable contact made with the body. Also, the invention may be embodied in razors with moving blades and other cutting instruments. Under certain conditions, the polarity of the current may be reversed, although the best results have been obtained by connecting the negative pole of the battery with the blade.

Another modification would be to provide a rigid connection between the handle and the neck

portion 14 or other support for the blade seat 11, and then provide a removable cap or other equivalent means at the lower end of the handle for supporting the battery in such handle.

What I claim is:

1. A razor comprising a blade and support therefor, and a source of electrical energy associated with the support and connected at one pole thereof with said blade and at its other pole with the support whereby current from such latter pole will pass through the hand of the user and form a closed circuit when the blade engages another portion of the body of the user.

2. A cutting device comprising a shaving edge, a support for such cutting edge, and a circuit including a source of direct current connecting such cutting edge with a portion of the body of the user, whereby, when such cutting edge engages another portion of the body of the user, the circuit will become closed.

3. A razor comprising a head portion, a blade mounted in said head portion and a handle portion for supporting the latter, the handle portion being made from electrically conductive material and having a longitudinal bore therein, an electric cell positioned within such bore, the positive pole of such cell being connected with the handle and the negative pole thereof being connected with the blade, thus forming an open circuit adapted to be closed when the body of the user is engaged by said blade.

4. A razor comprising a blade portion and a support therefor, such support having a recess therein adapted to receive a battery, means for providing an electrical connection between the blade and one pole of the battery and means for connecting the other pole with the hand of the user, forming an open circuit adapted to be closed when the user touches the blade to a portion of the body.

5. A cutting device comprising a shaving edge, a support for such cutting edge and a source of direct current associated with the supporting device, means providing an electrical connection between one pole of said current source and the body of the user and means connecting the other pole with said cutting edge.

6. A safety razor comprising a blade support and blade cap made from insulating material, a blade positioned between said support and cap and a tubular handle structure carried by but insulated from said blade and support therefor, a battery positioned within the handle structure, one of the poles of the battery being connected with the metallic handle, whereby current from one of the poles of the battery will pass through the handle to the body of the user, means for providing a removable connection between the handle and the blade support and means for providing an electrical connection between the second pole of the battery and the blade, thus forming an open circuit adapted to be closed when the user manually places the blade in engagement with a portion of his body.

7. A safety razor comprising a blade support and blade cap made from insulating material, a blade positioned between said support and cap, and a handle structure carried by but insulated from said blade and support therefor, said handle structure being made from metallic material and having a longitudinal bore therein, a battery positioned within said bore, one of the poles of the battery being connected with the metallic handle, whereby current from one of the poles of the battery will pass through the handle to

the body of the user, the upper end of the handle structure being provided with an internal threaded portion, an externally threaded collar of insulating material rigidly carried by the blade support and adapted to be removably supported 5 in said upper end portion of the handle struc-

ture and means providing an electrical connection between the second pole of the battery and the blade, thus forming an open circuit adapted to be closed when the user manually places the blade in engagement with a portion of his body.

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