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ELECTRIC RAZOR FOR SHAVING

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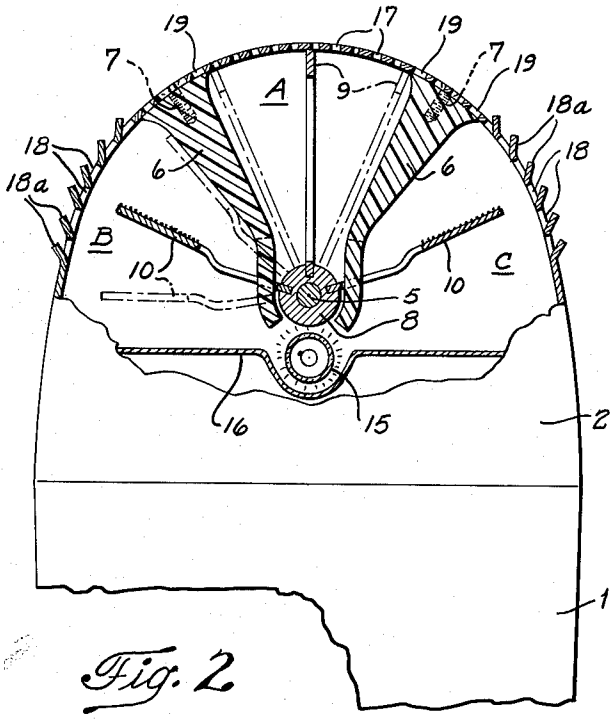
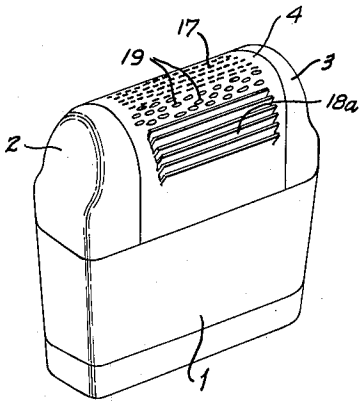


Fig. 2

Fig. 1



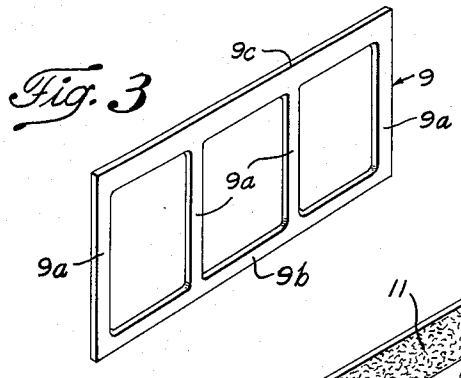


Fig. 3

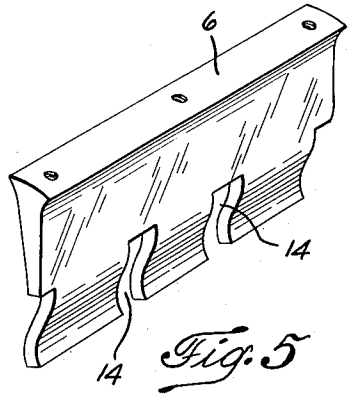


Fig. 5

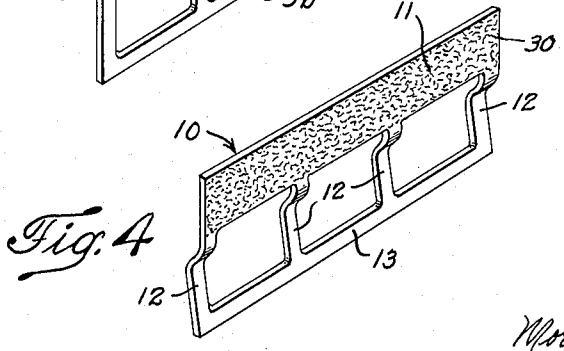


Fig. 4

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ELECTRIC RAZOR FOR SHAVING

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This invention relates to electric razors, particularly to electric razors having a lower body shell to house a motor which drives a cutting blade in an upper shaving head.

Customarily the shaving head has a centrally positioned cover plate with small orifices. The beard enters the orifices and is sheared off by the cutting blade, which moves with its cutting edge directly adjacent the undersurface of the cover plate.

This type of shaving operation is conducted without the benefit of lather or brushless type creams because the presence of liquid materials would interfere with the shearing action and also would foul the electrical and mechanical mechanism of the razor itself.

Shaving in such manner presents difficulties in achieving a close-cut shave. Perspiration on the skin softens the beard, causes the razor to stick to the skin, and usually causes a burn. Consequently, the cutting blade is less effective in shearing and the user's face is abused and irritated. In addition, the body of the razor frequently is held in a position between the shaving head and sources of light, so that the particular area of the skin being shaved cannot be observed except when the razor is removed. Moreover, the beard clippings are scattered and accumulated haphazardly within the shaving head in a manner which frequently interferes with the internal mechanism and often prevents ready disposal of the clippings and easy cleaning of the razor.

These difficulties are obviated by the present invention which provides an electric razor that automatically removes perspiration from the face during shaving to provide optimum conditions for shearing. The area of the skin being shaved is bathed in light so that the progress of the shave and the quality of the shearing can be observed without any interruption of the shaving operation. In addition, the beard clippings are retained and collected in convenient position for easy removal without any necessity for cleaning the razor parts except after extremely long periods of use.

Briefly, this is accomplished in an electric razor having the usual lower body shell to house an electric motor and having the usual convex upper shell or shaving head, which is attached to the lower shell at the end portions of the upper shell. The upper shell has a central portion in the form of a cover plate, which is detachably engageable with the end portions of the upper shell and with the upper edges of the lower shell. A shaft is provided within the upper shell, supported by the end portions thereof, to extend longitudinally of the upper shell in a centrally disposed position. Driving connections between the shaft and the motor oscillate the shaft through an arc of about 45°. A sleeve is fixed to a shaft and a cutting blade is fixed to the sleeve at the 12:00 o'clock position for oscillating movement with the shaft. Two fan blades are also provided by fixing them to the sleeve at the 10:00 o'clock and 2:00 o'clock positions for oscillating movement with the shaft. Two partitions are fixed at their upper edges to the cover plate and each

of them extends downwardly between the arcs of travel of the cutting blade and the fan blades to a point adjacent the sleeve. The cover plate has a central area between the partitions and directly above the arc of travel of the cutting blade with small orifices in this central area for entry of the beard. The side portions of the cover plate directly above the arc of travel of the fan blades have air exit ports.

Preferably, the fan blades are covered at their upper sides with a thin layer of electrostatically active material, such as wool felt, and the partitions are made of electrostatically chargeable materials of polarity opposite to the fan blade material, such as Lucite. The partitions are positioned precisely at the end of the path of movement of the fan blades for light contact with the fan blades as the latter oscillate.

More preferably, a light source is supported by the end portions of the upper shell within the shaving head directly below the shaft, and the Lucite partition members terminate adjacent the light source to transmit light therefrom to the cover plate. The cover plate is provided with exit ports at this area to permit passage of the light outwardly.

Still more preferably, the end portions of the upper shell also support and fix a flat platform positioned below the light source. The platform is provided with an upper light reflecting surface to catch and reflect light from the light source back to the Lucite partition members to increase the amount of light transmitted and passed through the light exit ports of the shaving head.

Having indicated the nature of the invention briefly, the improved electric razor of the invention will now be described in more detail and by reference to the drawings showing a preferred embodiment thereof.

In the drawings,

Figure 1 is a perspective view of a preferred embodiment of the invention;

Figure 2 is a transverse section view through the center portion of the shaving head of the preferred embodiment of the invention;

Figure 3 is a perspective view, slightly enlarged, of the cutting blade which is an element of the invention;

Figure 4 is a perspective view, slightly enlarged, of the fan blade, which is an element of the invention; and

Figure 5 is a perspective view, slightly enlarged, of the light transmitting partitions, which are elements of the invention.

Referring now to the drawings, the electric razor of the preferred embodiment there illustrated has a lower body shell 1 containing the usual electric motor (not shown). The upper shaving head has the usual convex shape. It consists of end portions 2 and 3, and a cover plate 4 in the central portion thereof. The end portions 2 and 3 are attached in fixed position on lower body shell 1. The cover plate 4 is detachably engageable, as by snap fitting, for example, with the end portions 2 and 3 of the upper shell and with the upper edges of the lower body shell 1.

The end portions 2 and 3 journal a shaft 5 in a position centrally and longitudinally disposed within the upper shell. The shaft 5 is connected by the ordinary driving means familiar to the art (not shown) to the motor in the lower shell 1 so that the motor will cause the shaft 5 to oscillate. In this instance, the driving connections are arranged to provide an oscillation movement limited to an arc of about 45°.

Two partitions 6 (see Fig. 5) are fastened to the underside of the cover plate 4 by bolts 7. They extend downwardly to a point adjacent the shaft 5 to divide the upper shaving head or shell (i.e., end portions 2 and 3 and cover plate 4) into a cutting space A and into blowing spaces B and C on each side of the cutting space. As

shown in Figure 5, partitions 6 have a broad thickness where they are attached to the cover plate 4 and terminate in a relatively narrower thickness adjacent the shaft. Preferably, the partitions 6 are made of light transmitting materials, such as Lucite and the like.

A sleeve 8 is fixed to shaft 5 for oscillation therewith. As shown in Figure 5, the light transmitting partitions 6 have lower portions which closely encircle the sleeve 8. A cutting blade 9 (Fig. 3) is fixed in sleeve 8 at the 12:00 o'clock position for oscillation therewith. The blade has thin integral uprights 9*a* extending upwardly from support portion 9*b* through cutting space A to terminate integrally in a narrow shear-type cutting edge 9*c* that sweeps the undersurface of cover plate 4 through an arc of about 45°. This arc of travel of the cutting blade 9 ends at a point closely adjacent to the light transmitting partitions 6.

Two fan blades 10 are also fixed to sleeve 8 for oscillation movement therewith, but are mounted at the 10:00 o'clock and the 2:00 o'clock positions. The fan blades 10 (see Fig. 4) each have a broad upper impeller surface 11 integrally supported by thin uprights 12 which are integral with a thin support member 13. The support surface 13 is mounted in the sleeve 8 with the uprights 12 extending through cooperating slots 14 in light transmitting partitions 6 for full freedom of oscillating movement by the impeller surface 11 of the fan blades 10 in blowing spaces B and C. As the fan blades oscillate, they describe an arc of movement of about 45° extending from horizontal position to a position in firm contact with light transmitting partition members 6. Caution should be exercised in locating the light transmitting partitions 6 so that they lie in the path of the movement of fan blades 10 to insure only a light but sure contact between the fan blades 10 and the light transmitting members 6 during each oscillation.

Preferably, the upper surface of the impeller area 11 of each fan blade 10 has a thin layer of electrostatically active material 30 thereon, such as textured wool felt. Also, preferably, the light transmitting partitions 6 are made of an electrostatically active material of opposite polarity, such as Lucite or the like.

A small light bulb 15, or other concentrated light source, is mounted on end portions 2 and 3 within the upper shell or shaving head in a central position mid-way of the shaving head directly beneath shaft 5. The light is connected by ordinary electrical means to the motor power source so that it provides light when the motor drives the shaft. As shown in Figure 1, the terminating ends of the light transmitting partitions 6 encircle the sleeve 8 in a manner which focuses on light bulb 15. The end portions 2 and 3 of the upper shell also support a platform 16 which is positioned to act as a reflector beneath bulb 15 and has a shiny upper surface for this purpose.

A multitude of small orifices 17 are provided in the cover plate 4 directly above the cutting space A for entry of the beard during the shaving operation. The lower sides of the cover plate 4 are slitted longitudinally to provide a series of air exit slits 18 above the blowing spaces B and C with vanes 18*a* directed upwardly. In between the area of the air exit slits 18 and the area of the beard orifices 17, and above the light transmitting members 6, the cover plate 4 has a large number of light exit ports 19.

In operation of the invention, the razor is connected to an outside electric power source in the usual manner. The circuit is closed by the usual switch on the razor to actuate the electric motor and to actuate the light bulb 15. This causes the shaft 5, the sleeve 8, the cutting blade 9 and the fan blades 10 to oscillate rapidly. The broad impeller surfaces 11 of the fan blades 10 provide a blowing action which directs air outwardly from within the shaving head through the air exit slits 18. The vanes 18*a* direct the air movement upwardly. Because of the intermittent contact between the electrostatically active upper surface of the fan blades 10 and the electrostatically active partitions 6, an electrostatic charge is created in the partitions 6.

When the person operating the device places the shaving head in contact with his face, the hairs of the beard enter and pass through orifices 17 and into the cutting space A where the cutting blade 9 shears off the beard. As the clippings scatter, they are attracted by the electrostatically charged partitions 6 and cling to the walls thereof in an orderly fashion. Movement of the clippings slightly downwardly away from the cutting area occurs because the fan blades 10 tend to create a slight vacuum in the cutting space A by reason of the movement of air outwardly from blowing spaces B and C. The air driven outwardly by fan blades 10 is directed upwardly by vanes 18*a* where it strikes the area of the face being shaved and removes perspiration therefrom. Light from bulb 15 is picked up by light transmitting members 6 and conducted outwardly through light exits 9 to flood the area of the face being shaved with light.

During the operation, the beard is shaved very close because of highly efficient shearing action. The shave is also completed relatively rapidly because the person conducting the operation has full vision of the progress of the shaving.

After the operation is completed, the outside power source is turned off and the electrostatic charge on light transmitting partitions 6 holds the clippings in place. When another shave is desired and the power source is applied again, the charge on light transmitting members 6 collects the new clippings as well. The operation is repeated for a large number of times until the clippings that have accumulated within the shaving head must be removed from the razor. The cover plate 4 then is squeezed slightly to disengage it from the lower body shell 1 and the end portions 2 and 3. The cover plate 4 is removed, the razor is turned upside down, and the clippings are brushed into any convenient receptacle.

It should be understood that the invention is not limited to oscillating type electric razors. The invention is easily adapted to equivalent arrangements. E.g., in a reciprocating razor the oscillating cutting blade is replaced by two cutting blades with orifices therein that reciprocate in opposite directions one over the other, and reciprocating fan blades are provided in the side portions of the razor head. Similarly, in a rotary type razor the cutting blade is a disc and the fan blades are mounted on the disc shaft to rotate outside the perimeter of the disc. In this latter instance, one circular light transmitting partition is provided at the perimeter.

It should also be understood that the invention is not limited to the details of the preferred embodiment illustrated in the drawings and described above.

I claim:

1. An electric razor comprised of a lower body shell adapted to contain an electric motor arranged for electrical connection to an outside power source, a convex shaped upper shell attached to the lower shell at the end portions of the upper shell, the upper shell having a central portion consisting of a cover plate which is detachably engageable with the end portions of the upper shell and with the upper edges of the lower shell, a shaft within the upper shell and supported by the end portions thereof to extend longitudinally in a centrally disposed position, said shaft being arranged for driving connection with the motor for oscillation through an arc of about 45°, a sleeve fixed to the shaft for oscillation therewith, a cutting blade fixed to the sleeve at the 12:00 o'clock position for oscillation movement with the shaft, the cutting blade having a lower support portion for mounting on the sleeve and thin uprights extending therefrom which terminate in a thin cutting edge, two fan blades fixed to the sleeve at the 10:00 o'clock and 2:00 o'clock positions for oscil-

lation with the shaft, two partition members fixed to the undersurface of the cover plate and extending downwardly to a point adjacent the sleeve between the arcs of travel of the cutting blade and the fan blades, the cover plate having small orifices in the central area between the partitions and directly above the arc of travel of the cutting blade, and the cover plate also having air exit ports in side areas directly above the arc of travel of the fan blades.

2. The subject matter of claim 2 characterized by the fact that the upper sides of the fan blades have a thin layer of electrostatically active material and the partition members are made of electrostatically active material of polarity opposite the fan blade material, and the partitions are positioned at the upper end of the path of movement of the fan blades for light contact with the fan blades to induce an electrostatic charge in the partition members during oscillation of the fan blades.

3. The subject matter of claim 2 characterized by the fact that the upper sides of the fan blades are covered with a thin layer of wool felt and the partitions are made of Lucite.

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