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W. A. PHELPS

2,204,444

ELECTRIC RAZOR

Filed April 2, 1938

FIG. 1.

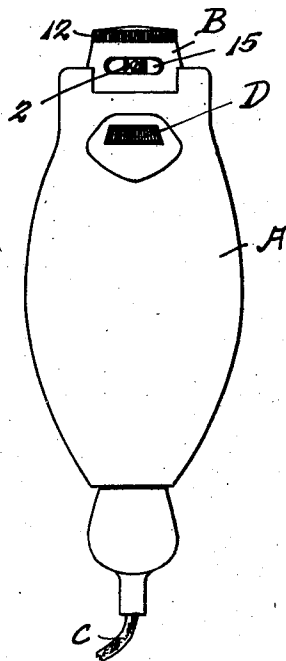


FIG. 2.

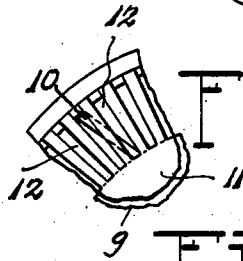
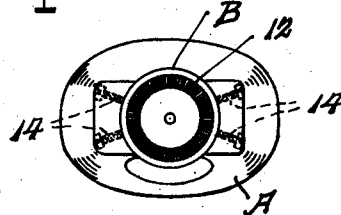


FIG. 6.

FIG. 3.

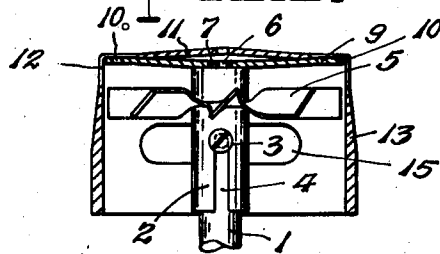


FIG. 4.

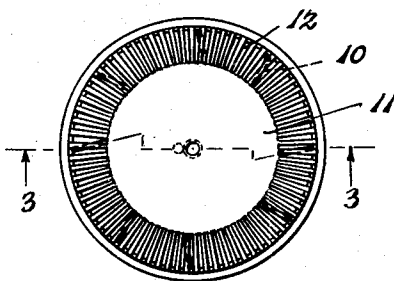
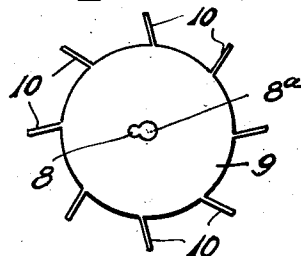


FIG. 5.



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ELECTRIC RAZOR

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Application April 2, 1938, Serial No. 199,694

2 Claims. (Cl. 30-43)

The present invention comprises a novel form of motor operated type razor, largely known today as an electric razor.

A primary feature of the invention lies in a special provision made for drawing off the hairs which are severed by the action of the razor in the movement of the cutter head over the face of the user. For this purpose I have availed of a suction fan arranged proximate to the cutter head and to the cutter or guard plate which extends over the cutter and operates in conjunction therewith.

Another feature of my invention lies in the provision of a rotary cutter, preferably constantly driven, and adapted, by reason of the formation of the cutter blades thereof, to act in conjunction with the cutter plate or guard with a shearing effect in the cutting operation.

My invention further involves a general novel assemblage of the suction fan unit and cutting means to provide an efficient cutting instrument of the class referred to.

An additional feature of my invention involves the formation of the cutter head, the surface thereof adapted to be pressed against the face of the user being slightly concave outwardly for more efficient accomplishment of the shaving operation and to minimize friction between the cutting member and cutter plate or guard.

In the accompanying drawing—

Figure 1 is a side view of a motor operated type razor embodying the invention.

Figure 2 is an end view showing more particularly the cutter head and its mounting on the handle.

Figure 3 is a vertical sectional view taken on about the line 3-3 of Figure 4.

Figure 4 is an end view of the cutter head showing the cutting member disposed therebeneath in dotted lines.

Figure 5 is a plan view of the cutting member with its blades, alone.

Figure 6 is an enlarged view of the cutting plate and cutting member, showing the disposition of the blades of the cutting member relatively to the slots of the cutting plate or guard.

In the drawing a preferred embodiment of my invention is illustrated as comprising generally the handle A and the cutter head B associated therewith and detachably mounted upon the handle at one end thereof. The handle A or body of my razor houses in the usual manner a motor which comprises the driving shaft 1, see Figure 3, upon which shaft is carried the sleeve 2. The sleeve 2 is detachably secured to the shaft 1 by

means of the set screw 3, or any suitable means of an equivalent nature, said sleeve having a slot 4 therein enabling the same to be moved longitudinally on the shaft 1 when adjusted to the correct position to be secured in fixed relation to the shaft by the screw 3.

The sleeve 2 is a carrier for the suction fan 5 which may be of any suitable construction, and said fan is retained on the upper end of the sleeve 2 by pressing or shrinking the fan structure upon the sleeve. The upper end of the sleeve carries a stud shaft 6 and a fixed key member 7 adapted to enter a keyhole slot 8 in the cutting member 9, while shaft 6 extends into hole 8a of the center of the cutting member, the latter being equipped with the approximately radially disposed blades 10.

The cutting member 9 rests upon the upper end of the sleeve in interlocked connection therewith by means of the key 7 and is held from displacement by means of the guard or cutter plate 11, which is formed at its peripheral portion with the grid or slotted annulus 12 through which the hairs of the person being shaved may enter the space of the cutting area of the cutting member 9 comprising the blades 10.

The guard 11, which acts as a cutting plate cooperating with the cutting member 9, is formed with a depending hood or skirt portion 13, and the latter is seated in a recess at the upper end of the handle A. Suitable radially mounted screws 14 that are carried by the upper end portion of the handle A engage with the lower end of the skirt or hood 13 and hold the same detachably in place upon the handle.

It is notable that the central portion of the cutting member 9 is depressed or slightly concave inwardly of the hood 13, the blades 10 frictionally contacting with the underside of the guard at the peripheral slotted annulus of the latter. The guard or hood 11 is likewise slightly concave outwardly at its center adjacent the central portion of the cutting member 9. On account of the above structures of the parts 11 and 9, the friction from these parts is confined primarily to the portions directly contacting, which are the blades 10 and the slotted annulus portion 12 of the member 11. The slots previously referred to as 12 extend radially at the outer edge portion of the guard 11 and longitudinally of the handle a short distance down the hood or skirt portion 13.

By reason of the round formation of the cutter head B, it will be evident that the same may be moved in any direction upon the surface of the body which is being shaved, and the cut-

ting action of the blades 10 is effective under all such conditions, without need of turning the handle when changing direction of movement of the device.

It is notable that the motor in the handle A may be of any conventional type and will be supplied with electric current by the lead C. Said motor is not illustrated as its construction may take different forms. On the shaft 1, driven by the motor, is a knurled starting wheel D, shown in Figure 1.

It is notable that the cutter blades 10 are arranged at somewhat of a tangent to the axis shaft 1 supporting the sleeve 2 and cutter member 9, the purpose of this structure being to arrange the members 10 slightly out of parallel to the radial slots of the slotted annulus 12, whereby the cutter blades working in conjunction with the slotted portion of the guard 11 will operate with a shearing cutting action, which is desirable for the purpose of efficient operation of the instrument. The formation of the parts 9 and 11 as to the spacing of their central portions reduces the amount of current or power necessary for operation of the device.

As the hairs are severed by the movement of the cutter head B over the surface carrying the hairs, the suction fan 5 pulls air through the slotted portion 12 of the cutter head B and forces said air through slots or openings 15 in the sides of the cutter head, one or more of which openings may be provided. In this manner the hairs severed by the razor are carried off, and this assists in preventing the clogging of the slots 12 and reduces the likelihood of the hairs remaining in the space between the parts 11 and 9.

It is contemplated within the purview of the invention that the blades 10 may be arranged parallel to the slots of the slotted annulus 12, if desired, but the arrangement above described is preferred because a more efficient shearing action is thereby secured.

Additionally, it may be noted that the central portion of the cutting member 9 need not necessarily be depressed inwardly, if the cutter guard 11 is concave outwardly. Preferably, however, either one or both the plate 9 and guard 11 will be formed as above described for the purpose of minimizing friction between said members. While the guard 11 need not be formed concave outwardly, if the plate 9 is depressed inwardly, the outward concave formation of said guard is desirable for the additional reason that a more efficient cutting action is secured in reference to the contact of the cutter guard with the portions of the body being shaved.

If desired the fan 5 and cutter member 9 may be secured directly to the motor or drive shaft 1,

without recourse to the employment of the sleeve 2.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States, is—

1. In a motor driven razor construction, in combination, a handle, a motor driven shaft carried by said handle, and detachable cutting means, comprising a cutter head of hood-like formation detachably secured to said handle, said cutter head including a guard portion and a depending skirt portion having an opening therein, a member detachably associated with said shaft and axially slidable respecting the same to different positions for adjustment of said member relative to the guard portion of said head, means for maintaining said member in fixed relation to said shaft upon axial adjustment of said member, a rotary cutting member detachably secured to said first member in fixed relation thereto and co-acting with the guard portion of said head, and a suction fan member carried by said first member for drawing off hairs severed by the cutting member, said fan being located within the skirt portion of said head adjacent the aforesaid opening therein, whereby the hairs drawn off by said fan will be exhausted from said head through said opening.

2. In a motor driven razor construction, in combination, a handle, a motor driven shaft carried by said handle, and detachable cutting means comprising a cutter head of hood-like formation detachably secured to said handle, said cutter head including a guard portion and a depending skirt portion having an opening therein, said guard portion being provided with radial slots extending downwardly of said skirt portion, a member detachably associated with said shaft and axially slidable respecting the same to different positions for adjustment of said member relative to the guard portion of said head, means for maintaining said member in fixed relation to said shaft upon axial adjustment of said member, a rotary cutting member detachably secured to said first member in fixed relation thereto and co-acting with the guard portion of said cutter head, said cutting member comprising a disk having spaced rectilinear blades each extending from the circumference of said disk at an acute angle to a radial line intersecting said blade, and a suction fan secured to said first member for drawing off hairs severed by said cutting member, said fan being located within the skirt portion of said head adjacent the aforesaid opening therein, whereby the hairs drawn off by said fan will be exhausted through said opening.

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