May 3, 1938. E. G. BADER 2,116,229

ELECTRIC RAZOR

Filed Nov. 23, 1936

Fig. 1.

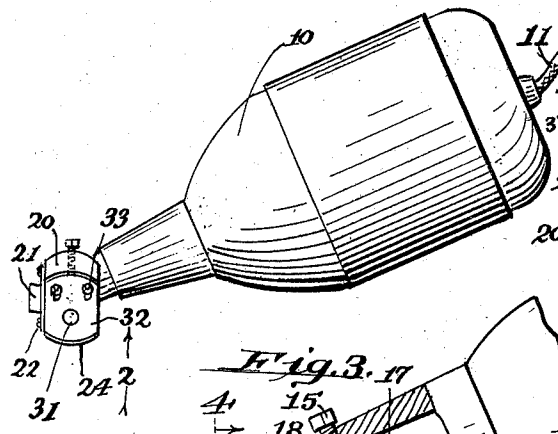


Fig. 2.

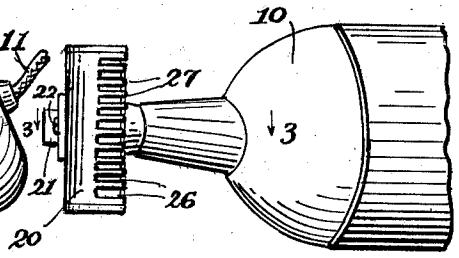


Fig. 3.

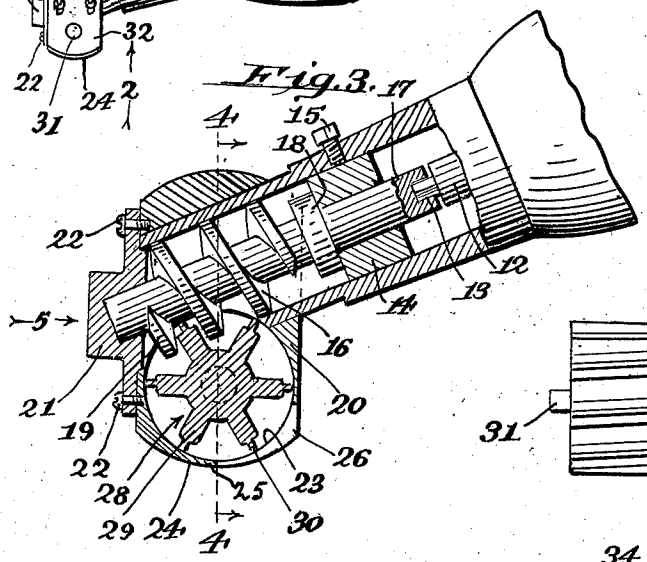


Fig. 6.

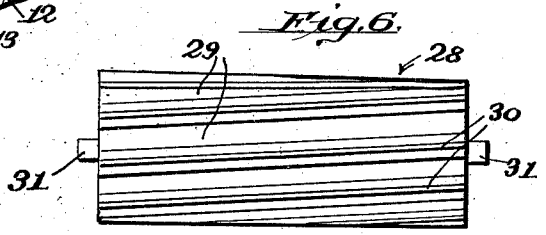


Fig. 4.

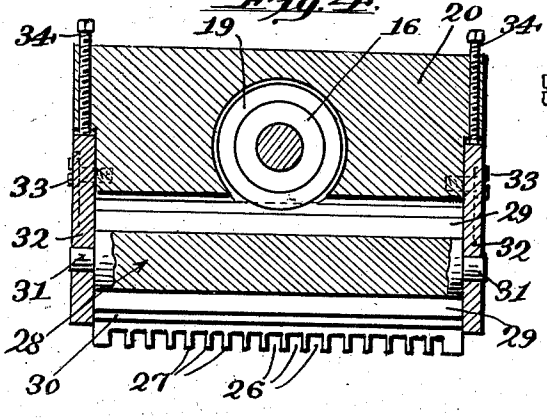
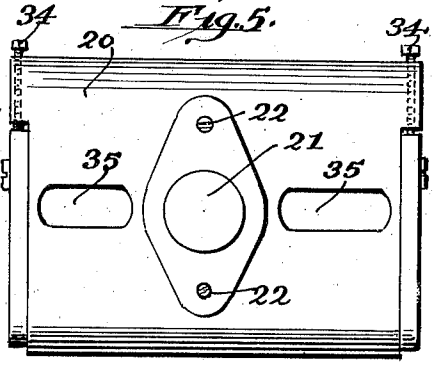


Fig. 5.



Inventor
Edward G. Bader
by Hazard and Miller
Attorneys.

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UNITED STATES PATENT OFFICE

2,116,229

ELECTRIC RAZOR

Edward G. Bader, Inglewood, Calif.

Application November 23, 1936, Serial No. 112,322

2 Claims. (Cl. 30—43)

This invention relates to an electric razor.

An object of the invention is to provide a razor electrically operated in its preferred form, wherein there is a body or housing providing a stationary blade adjacent which there is a suitable guard and a bladed rotor driven by the electric motor and rotatably mounted adjacent the blade to cooperate therewith in shearing hair.

The present razor operates primarily on a shearing as distinguished from a cutting principle.

Another object of the invention is to provide a razor having a stationary blade adjacent which is rotatably mounted a bladed rotor and to provide a novel, simple, and durable construction for rotating the rotor at required speed to cause the construction to adequately shave all surface traversed by the razor.

Another object of the invention is to provide a razor construction having a novel, simple, and advantageous guard construction so arranged as to expose the entire length of the stationary blade, affording an opportunity for hair traversed by the guard to freely stand immediately in front of the stationary blade so as to be sheared off.

With the foregoing and other objects in view, which will be made manifest in the following detailed description, and specifically pointed out in the appended claims, reference is had to the accompanying drawing for an illustrative embodiment of the invention, wherein:

Fig. 1 is a view in side elevation of the improved electric razor.

Fig. 2 is a partial view of the under side of the razor taken in the direction of the arrow 2 upon Fig. 1.

Fig. 3 is a partial view in vertical section taken substantially upon the line 3—3 upon Fig. 2.

Fig. 4 is a sectional view taken substantially upon the line 4—4 upon Fig. 3.

Fig. 5 is a front view in elevation of the razor, taken in the direction of the arrow 5 upon Fig. 3.

Fig. 6 is a view in elevation of the cutter or bladed rotor.

Referring to the accompany drawing, wherein similar reference characters designate similar parts throughout, the improved razor consists of a suitable tubular handle 10 within which is mounted a small electric motor which may be of any preferred design and which is supplied with current preferably through a flexible cord 11 for attachment to a light socket.

The rotor shaft of the motor that is enclosed within the handle is indicated at 12 and preferably has a squared end as indicated at 13. Within the handle there is mounted a bearing block 14 held in position as by a set screw 15. This bearing block forms a bearing for a worm 16, the upper end of which is socketed as at 17 to receive the squared end 13 on rotor shaft 12. The worm is equipped with a thrust collar or shoulder 18 which bears against the bearing block 14 and the tooth or thread 19 on the worm is arranged to be located within a housing or body 20 into which the end of the handle extends. The body 20 has its forward face covered by a cap 21 held in position as by screws 22 and this provides a bearing for the lower end of the worm.

A cylindrical bore 23 extends transversely through the body or housing very close to the bottom thereof. The bottom of the housing is preferably convexly shaped, as indicated at 24, the curvature being somewhat greater than the radius of curvature of the bore 23. In this manner the bore 23 is very nearly tangent to the curved surface of the bottom of the housing at approximately the center line of the bottom of the housing forming a stationary blade 25 that extends across the housing and which is directed forwardly or underneath the handle.

The metal of the housing forwardly of the blade 25 is slotted as indicated by slots 26 forming the tines 27 of a guard for the blade, the tines terminating a short distance in front of blade 25. In this manner the tines of the guard are not only integral with the housing in the preferred form but their upper surfaces define a portion of the interior surface of bore 23.

Within bore 23 there is disposed a bladed rotor 28 having a plurality of blades 29. In the preferred form of construction these blades have their outer edges of reduced thickness as indicated at 30. The portions of reduced thickness form cutting edges designed to cooperate with the stationary blade 25 in shearing. The thickened portions of the blades 29 constitute the teeth of a worm wheel meshing with the thread or tooth 19 on the worm. While the blades 29 may extend transversely across the rotor, in the preferred form of construction they are given a very slight pitch as shown in Fig. 6 so as to be of slight helical contour.

The ends of the rotor are provided with trunnions 31 disposed in bearings 32 which are held on the body by means of screws 33 disposed in slots in the bearings. Adjusting screws 34 which are threaded into the body or housing 20 may be utilized to advance the bearings 32 and thus effect a fine adjustment of the rotor 28 with respect to the stationary blade 25.

The operation and advantages of the improved electric razor are as follows:

In the course of shaving the razor is moved across the face in a manner quite similar to that of a conventional safety razor. The guard tines 27 being located closely adjacent the blade 25 serve to prevent inadvertent cutting or lacerations. However, as the tines terminate forwardly of the blade 25, as shown on Fig. 2, any hair covered by a tine in the course of movement of the razor is afforded an opportunity just ahead of the stationary blade 25 to stand freely before it is encountered by the stationary blade. The rotation of the motor produces rotation of the worm 16 which is turn rotates the bladed rotor.

In the construction shown, if the electric motor is designed to rotate at a speed of 1700 R. P. M. the relation between the bladed rotor and the worm is such as to cause 1700 shearing cuts to take place per minute in as much as one blade is caused to sweep adjacent the stationary blade 25 for every revolution of the worm. This high succession of shearing cuts serves to easily and quickly cut all hair from the skin traversed by the razor without pulling due to the fact that cutting action by blade 25 is not relied upon except in conjunction with the shearing action involved in the blade 29 moving across the stationary blade.

While the stationary blade 25 has its cutting edge quite thin, it need not be as thin as the edge of a razor blade which is used for cutting as distinguished from shearing.

From the above described construction it will be appreciated that the improved electric razor is of simple and sturdy construction, having a relatively few moving parts. It will enable shaving to be accomplished without pulling and cause all hair traversed by blade 25 to be sheared off. Due to the fact that the tooth on the worm engages the sides of the thick portions of the blades the thin portions of the blades which present the shearing edges are not engaged by the worm nor are their edges dulled in any manner.

The holes 35 formed in the front of the housing provide for egress of cut hair from bore 23. The present razor is primarily designed for use without requiring the application of lather or the equivalent and such being the case there is no necessity for frequent or regular cleaning. However, when cleaning is necessary this may be easily accomplished by removing one of the bearings 32, which enables the rotor to be withdrawn and cleaned. Likewise, removal of cap 21 permits removal of the worm for this purpose when occasion requires.

Various changes may be made in the details of construction without departing from the spirit or scope of the invention as defined by the appended claims.

I claim:

1. In a razor, a housing providing a stationary blade extending transversely thereof, a bladed rotor in the housing, the blades of which are arranged to sweep adjacent the stationary blade, a worm extending into the housing meshing with the blades of the rotor and serving to rotate the rotor, the edges of the blades of the rotor being of reduced thickness so as to present shearing edges which cooperate with the stationary blade and which will not be engaged by the worm, and means for rotating the worm.

2. In a razor, a housing providing a stationary blade extending transversely thereof, a bladed rotor in the housing, the blades of which are arranged to sweep adjacent the stationary blade, a worm extending into the housing meshing with the blades of the rotor and serving to rotate the rotor, the edges of the blades of the rotor being rebated to present shearing edges which cooperate with the stationary blade but which will not be engaged by the worm, and means for rotating the worm.

EDW. G. BADER.