

Feb. 3, 1942.

J. D. ALTEMUS

2,272,054

ELECTRICAL RAZOR

Filed March 31, 1938

3 Sheets-Sheet 1

Fig. 1.

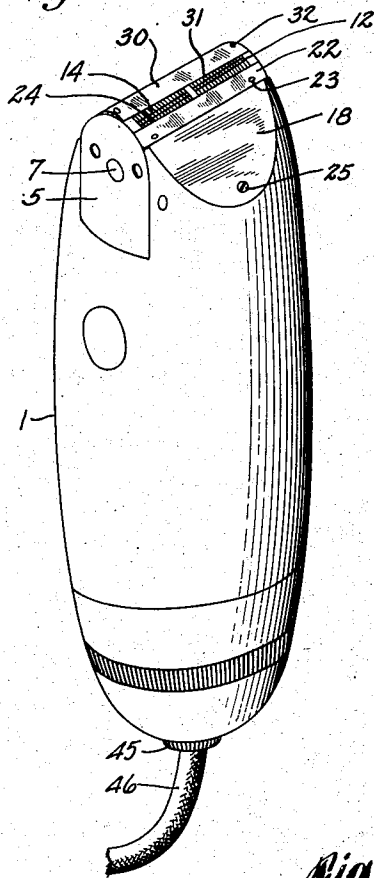


Fig. 2.

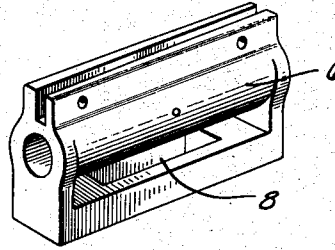


Fig. 3.

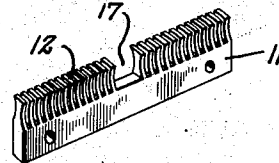


Fig. 4.

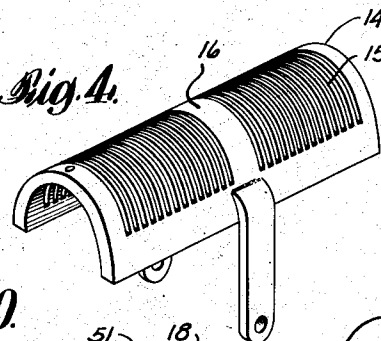


Fig. 10.

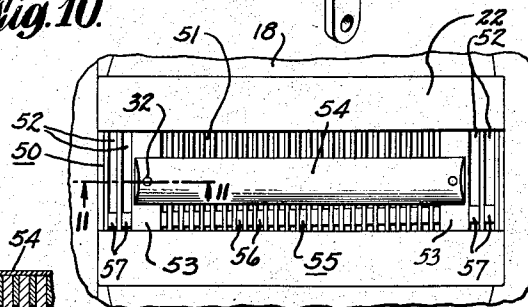


Fig. 5.

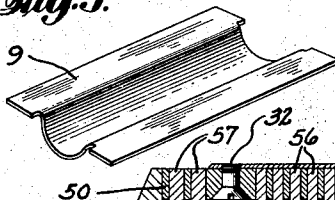
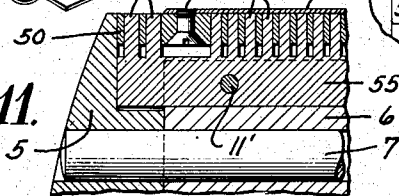


Fig. 11.



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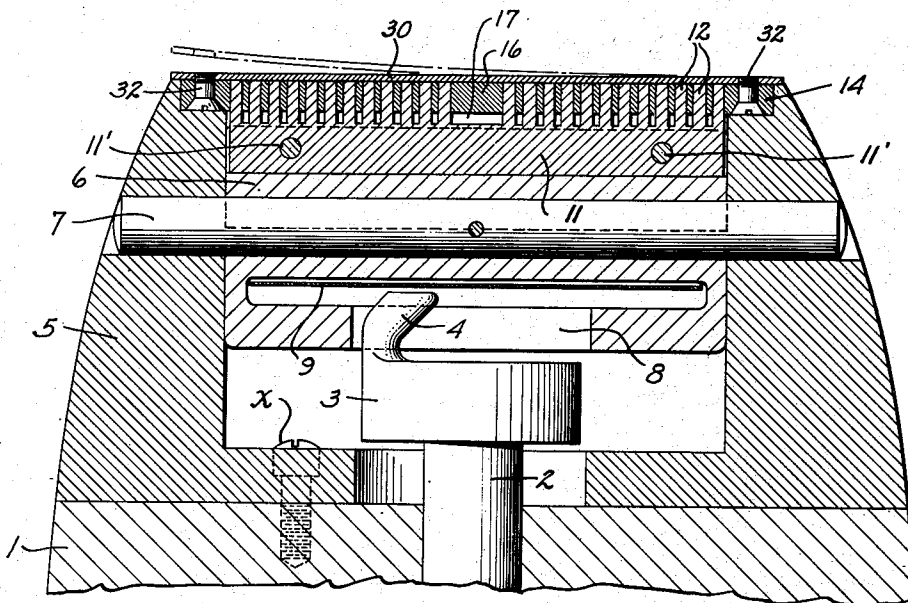
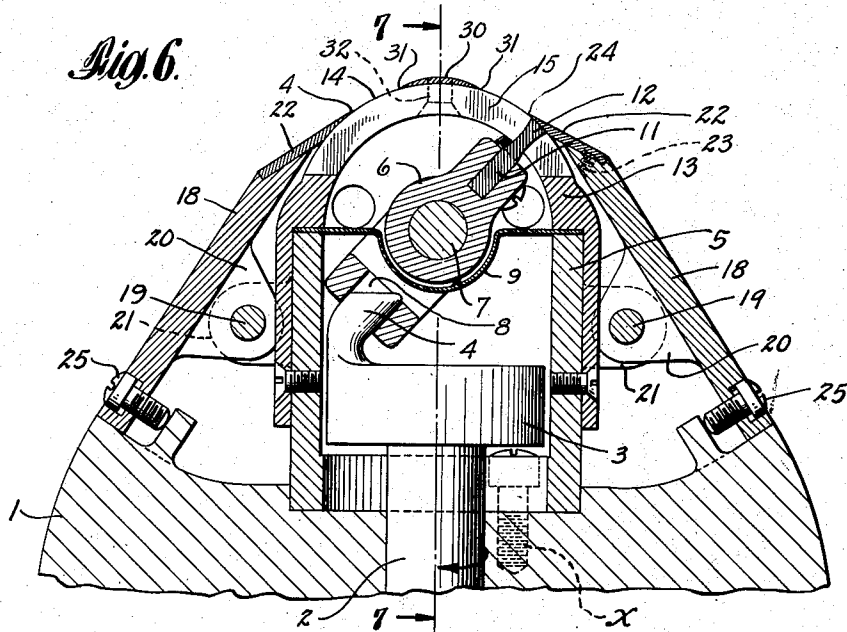


Fig. 7.

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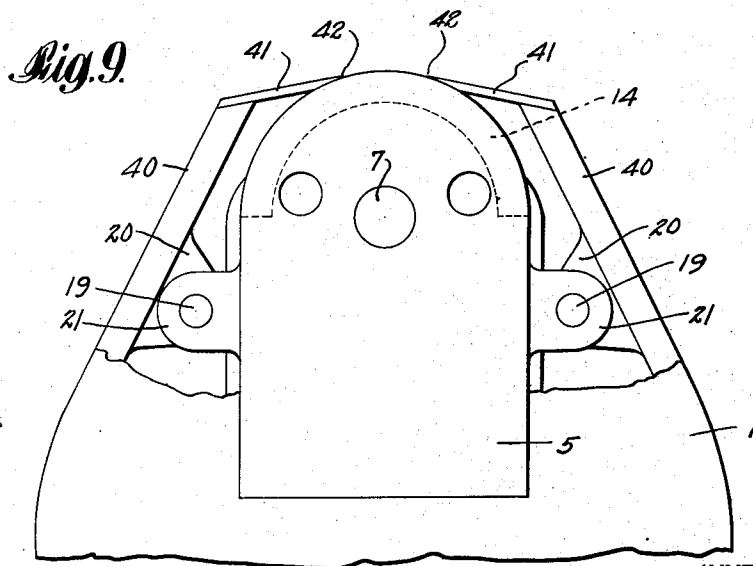
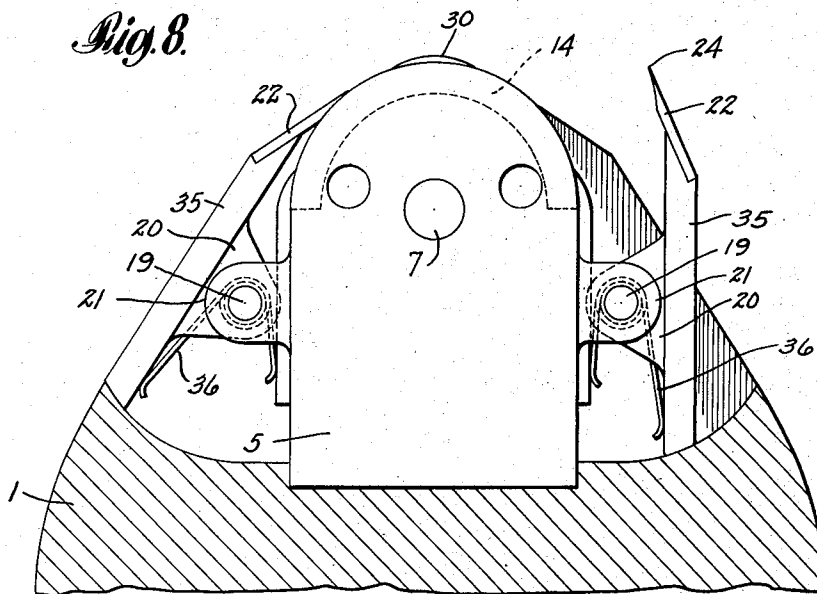
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2,272,054

ELECTRICAL RAZOR

Filed March 31, 1938

3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,272,054

ELECTRICAL RAZOR

James Dobson Altemus, Roslyn, N. Y.

Application March 31, 1938, Serial No. 199,108

9 Claims. (Cl. 30—43)

This invention relates to electric shaving implements of the true razor type, as contra-distinguished from the clipper type, and has for its particular objects the provision of an implement of that character in which the movable blade member or cutter bar and the co-operating stationary blades on the shearing head are so disposed that the shearing edges of these members are exposed so as to have substantially flush engagement with the skin during the shaving operation while only the hairs which it is desired to cut are permitted to project through the guard or comb, thus effectively protecting the skin at all times against laceration or injury. Other objects of the invention are the provision of an implement which is sturdy, compact, attractive in appearance and in which the shearing edges of the cutting elements while being easily renewable, are capable of long service without requiring their resharpening, besides the other advantages hereinafter set forth.

In the accompanying drawings, in which I have illustrated preferred forms of my invention:

Figure 1 is a perspective view of an electrical razor embodying my invention;

Fig. 2 is a perspective view of the oscillating blade holder, isolated;

Fig. 3 is a perspective view of the movable blade element, isolated;

Fig. 4 is a perspective view of the stationary guard or comb member, isolated;

Fig. 5 is a perspective view of the separator or pan for collecting the cut hairs;

Fig. 6 is a fragmentary vertical section of the razor shown in Fig. 1;

Fig. 7 is a vertical section on line 7—7 of Fig. 6, but with the crank moved forward 90° to bring the blade to a central position;

Figs. 8 and 9 are fragmentary end elevations, with the housing partially broken away, of two different modifications; and

Fig. 10 is a fragmentary plan view and Fig. 11 a fragmentary vertical section of the shaving head, showing a modification wherein certain of the slots of the comb and the cutter teeth which oscillate therein are enlarged for the better reception and shearing of long hairs.

Referring to the drawings and the construction shown therein, the reference numeral 1 designates a housing, which also serves as a handle, of my improved electric razor and in which is housed an electric motor (not shown). Said motor serves to rotate the main shaft 2 in the direction indicated by the arrow in Fig. 6. A disk 3, having an eccentric crank pin 4, is

centrally mounted on the upper end of the shaft 2 and moves therewith.

In the top of the housing is mounted a shaving head 5, the same including an oscillatable blade holder or frame 6 which is mounted on a longitudinal axle 7 that is secured at its opposite ends in said head 5. Said blade holder has a rectangular slot 8 formed therein which receives said crank pin and co-operates therewith in the well known manner to effect oscillation of its blade holder upon rotation of the shaft 2. A channeled pan 9 which serves as a receptacle for severed hairs entering into the shaving head and also as a guard to prevent the same fouling the motor mechanism, is mounted directly below the blade holder 6. A cutter bar 11 which, as shown, has separated cutting elements or teeth 12, is rigidly and obliquely secured by screws 11' and 11'' in said blade holder, the same being adapted to oscillate therewith. An arcuate comb or guard member 13 is rigidly mounted on the shaving head, the comb having parallel spaced arcuate fingers 14 with parallel slots 15 formed therebetween, each of which is of a width to snugly receive a different tooth of the cutter bar while admitting of the free oscillation of the teeth in said slots. Preferably an arcuate reinforcing center bar 16 is formed on said comb and the cutter bar has a corresponding slot 17 formed therein to snugly receive said bar 16 while admitting of the free oscillation of the cutter bar with respect to said comb. Cheek pieces 18 are pivotally secured to the opposite sides of the shaving head, the same being mounted on pintles 19, each of which extends through the end plates of said head and also through forks 20 and 21 respectively carried by said cheek pieces and the shaving head. Each of said cheek pieces has a blade member 22 removably secured thereto by screws 23, said blade members having their opposing edges 24 sharpened to a knife edge for co-operation with the teeth of said oscillatory cutter bar.

Regulating screws 25 serve to maintain the knife edges 24 in intimate engagement with the outer surface of the fingers of the comb 13.

In the razor construction illustrated in Figs. 1, 6 and 7, a central reinforcing bar 30, having opposing knife edges 31, is rigidly secured to the stationary comb 13, preferably by screws 32 inserted from below. This central bar reduces the exposed area of the comb and also tends to minimize vibration of the comb in those cases where the spacing between the cheek pieces is relatively great, such as in this latter form of razor.

In Fig. 8, the cheek pieces 35 are elastically mounted on coil springs 36 which normally maintain the cheek pieces in elastic engagement with the comb 13, and when it is desired to brush out the accumulated hairs from the comb, these cheek pieces are adapted to be raised to the position shown at the right side of Fig. 8 by manually applying pressure to the lower end thereof.

In the modification illustrated in Fig. 9, the cheek pieces 40 and the blade members 41 carried thereby are so disposed as to leave but a relatively narrow area of the comb exposed and consequently the interposition of a stationary cutter bar, such as the bar 30 of the construction shown in Figs. 1, 6, 7 and 8, may be dispensed with. In such a construction, however, the shearing of the hairs will occur only along the two knife edges 42 of the blade members 41 instead of along the four knife edges of the three blade members employed in the construction illustrated in Fig. 1.

Preferably the teeth 12 of the cutter bar 11 are hollow ground or undercut on their lateral faces to provide a more efficient shearing action.

In order to dispense with the necessity of a central screw or other central retaining means to maintain the bar 30 in snug engagement with the stationary comb, said bar is formed of spring steel of concave curvature in longitudinal cross-section so that when the terminal screws are screwed home, the bar will be held in pressure engagement throughout with all of the fingers of the comb, the same as if a straight bar were employed and an additional central screw was provided to centrally secure the same to the central bar 16 of the comb.

In the modification shown in Figs. 10 and 11, the recess in the housing which receives the shaving head is enlarged to receive an enlarged comb 50 which is provided with a series of intermediate slots 51, generally corresponding in width to the aforesaid slots 15 of the comb 13, and also two series of enlarged terminal slots 52 which, while generally similar to the slots 51, are preferably of greater width, for example some twenty-five thousandths of an inch, in order to facilitate the entrance of long curly hairs thereinto. Adjacent, but not at the ends of the comb 50, are transverse reinforcing bars 53 and preferably the central portion of the comb is slotted in lieu of providing a reinforcing center bar, such as the bar 16 shown in Fig. 4, in order to partially compensate for the abbreviation of the central or shaving area of the comb as a result of the addition of the two series of enlarged terminal slots. These bars 53 also serve as anchorages for the screws 32 which secure the central blade 54 to the comb.

The cutter bar also is provided with three series of teeth, namely an intermediate series of teeth 56 adapted to freely oscillate in the slots 51 of the comb generally conforming in size to the teeth 12 and two series of terminal teeth 57 which are of greater width, being slightly narrower than the width of the wide terminal slots 52 of the comb 50 in which they are adapted to freely oscillate.

The terminal slots 52 of the comb 50, being preferably substantially wider than the intermediate slots 51 and being relatively long, because of being unobstructed by the central blade 54, serve to facilitate the entrance of long soft curly hairs which otherwise might escape the shearing action of the cutter teeth.

In operation, the plug 45 of the usual flexible

cord 46 which supplies current to the motor, is plugged into the socket (not shown) of the housing or handle and the other end of the cord is plugged into the socket of an electric light fixture. The operation of the motor effects the rotation of the main shaft 2 which in turn imparts motion to the crank pin 4 and the latter, co-operating with the slot 8 in the blade holder 6, imparts an oscillating motion to the blade holder upon which the cutter bar, as aforesaid, is rigidly mounted. The teeth or cutting elements 11 of the cutter bar oscillate in the slots 15 of the comb and, as illustrated in Figs. 6 and 7, the same project into said slots so as to be flush with the outer surface of the fingers and thereby said cutting elements are enabled to intimately engage the knife edges of the cheek piece 18 and of the center bar 30. When the instrument is held so that the exposed guard rests on the face of the user and then said razor is moved back and forth across the face in the manner customary in shaving with an electrical shaver, the hairs will project through the slots in the comb and be sheared off flush with the skin upon the progressive or shearing engagement of each cutting element or tooth of the obliquely disposed cutter bar with the knife edges of the co-operating cheek piece and the opposing shearing edge of the center stationary cutter plate. In no case should the shearing areas of the cutter bar extend beyond the exposed outer surface of the guard member which engages the skin of the user during the shaving operation, as were the shearing areas to project the slightest degree beyond the outer surface of the guard, the skin would become objectionably irritated, if not injured thereby during such shaving operation.

The shaving head in each of the various forms of razor construction herein illustrated is removably mounted in the housing, being preferably secured thereto by diagonally opposed screws *x*, but one of which is illustrated.

While I have illustrated a cutter bar which is adapted to oscillate, I may employ a continuously rotating cutter member of the general type shown in Patent No. 1,247,828 granted Nov. 27, 1917, but having the blades thereof substituted by cutter bars of the type herein described wherein the shearing edges are discontinuous and adapted to travel in the slots of the guard, but in such event, the trailing edge or edges of the slot or slots in the shaving head are, of course, not required to be sharpened as they would not function as shearing edges.

In order to prevent the skin of the user from penetrating between the bars or fingers of the transversely slotted guard member during the shaving operation, such fingers are spaced approximately nineteen thousandths of an inch from each other, though this distance may be varied within reasonable limits, but it is desirable that these slots should be of the maximum width compatible with the protection of the skin against injury or irritation during the shaving operation in order to facilitate the entrance of hairs to be shorn into such slots through which the shearing elements of the cutter bar are oscillating.

I am well aware of the Patent No. 1,286,606, granted Dec. 3, 1918, wherein an oscillating cutter bar having a continuous cutting area and which projects beyond the outermost limits of a protective movable guard is employed and accordingly, make no claim herein to any such construction.

Various changes or modifications of the con-

struction herein disclosed may be made without departing from the spirit of my invention as embraced within the scope of the appended claims.

Having thus described my invention, what I claim and desire to obtain by United States Letters Patent is:

1. In an electrical razor, the combination comprising a shaving head, a movable cutter bar having a discontinuous shearing edge mounted therein and adapted to move transversely of the head, a co-operating stationary blade member having a longitudinal shearing edge also carried by said head, a protective apertured guard member, which guard member and cutter member are relatively movable with respect to each other and the outer surface of which guard member is flush with the extreme outer surfaces of the shearing areas of said cutter member and means for moving said cutter member.

2. In an electrical razor, the combination comprising a shaving head having a longitudinal slot whose margins constitute shearing edges, a transversely slotted stationary guard member positioned in said slot, a movable cutter bar having a discontinuous cutting edge mounted in said head and adapted to periodically cross the respective shearing edges of said slot, the cutting areas of the edge of said cutter bar lying flush with the outer surface of said guard and means for effecting movement of said cutter bar.

3. In an electrical razor, the combination comprising a slotted shaving head, the margins of said slot constituting shearing edges, a movable cutter bar mounted in said head and adapted to periodically cross the line of the respective shearing edges of said slot and to co-operate therewith to effect the shearing off of hairs entering said slot, a guard member interposed in said slot, the portions of said guard member adjacent the said shearing edges of the slot lying below the same, said guard member having a series of transverse slots therein and the shearing portions of said cutter bar being discontinuous longitudinally thereof and being adapted to travel in the slots in said guard and to extend outwardly so that the outer periphery of its path of movement lies flush with the outermost surface of the slotted area of said guard and a supplemental stationary cutter bar having opposing shearing edges mounted on said shaving head outside of said guard and intermediate the aforesaid shearing edges of said slot.

4. In an electrical razor, the sub-combination comprising a stationary, transversely slotted guard member and a movable cutter bar having longitudinally discontinuous shearing elements, each of said shearing elements being adapted to travel in a different slot in said guard and the outermost surface of each of the shearing elements of the cutter bar lying flush with the outer surface of the adjacent slotted portion of said guard when said cutter bar passes the shearing line of the said slot in the shaving head.

5. In an electrical razor, the sub-combination comprising a stationary guard member having a plurality of parallel transverse slots therein and a movable cutter bar having a plurality of shearing elements formed on the outer surface

thereof, the combined shearing elements constituting a discontinuous cutting edge and each of such shearing elements being adapted to travel in a different slot in said guard, and the outer surface of said shearing elements being adapted to extend longitudinally flush with the outer surface of the slotted portion of said guard when the shearing elements of the cutter bar travel through said slots in the guard.

6. In an electrical razor, the sub-combination comprising a stationary, arcuate guard member having a plurality of parallel transverse slots therein and a movable cutter bar having a plurality of shearing elements having shearing areas formed on the outer surface thereof, the combined shearing areas constituting a discontinuous cutting edge and each of such shearing elements being adapted to travel in a different slot in said guard, and the outer surface of said shearing elements being adapted to extend longitudinally flush with the outer surface of the slotted portion of said guard when the shearing areas of the cutter bar travel through said slots in the guard.

7. In an electrical razor, the sub-combination comprising a cutter bar having separated shearing areas which constitute a discontinuous shearing edge and having grooves intermediate said cutting areas, a stationary guard member having spaced, transversely extending bars, the said bars being adapted to extend into the grooves in said cutter bar during the movement of said cutter bar transversely of said guard and the outermost surface of the shearing edges of the cutter bar projecting flush with the outer surface of the transverse bars of the guard member during the movement of the cutter bar transversely of the guard member.

8. In an electrical razor, the sub-combination comprising a shaving head having a longitudinal terminal slot formed therein, the margins of said slot constituting knife edges, a movable cutter bar longitudinally inclined with respect to said knife edges, a slotted guard member interposed in said slot, said cutter bar having separated shearing elements which constitute a discontinuous shearing edge and said shearing elements each passing through a different slot in said guard during the movement of the cutter bar and said shearing elements extending flush with the outer surfaces of the adjacent portions of said guard during such movement.

9. In an electrical razor, the sub-combination comprising a comb member having a plurality of transverse slots formed therein, at least one is of substantially greater width than the majority of the other slots, and a cutter bar having a plurality of teeth formed therein which co-operate with and are adapted to respectively freely oscillate while snugly fitting in the corresponding slots of said comb, the majority of said teeth being of a length to project entirely through the slots of the comb so as to be capable of movement in a path whose outer periphery is flush with the outer surface of said comb, whereby the shearing edges of the teeth and the laterally adjacent portions of the comb will have flush contact with the skin during a shaving operation.

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