

Dec. 13, 1966

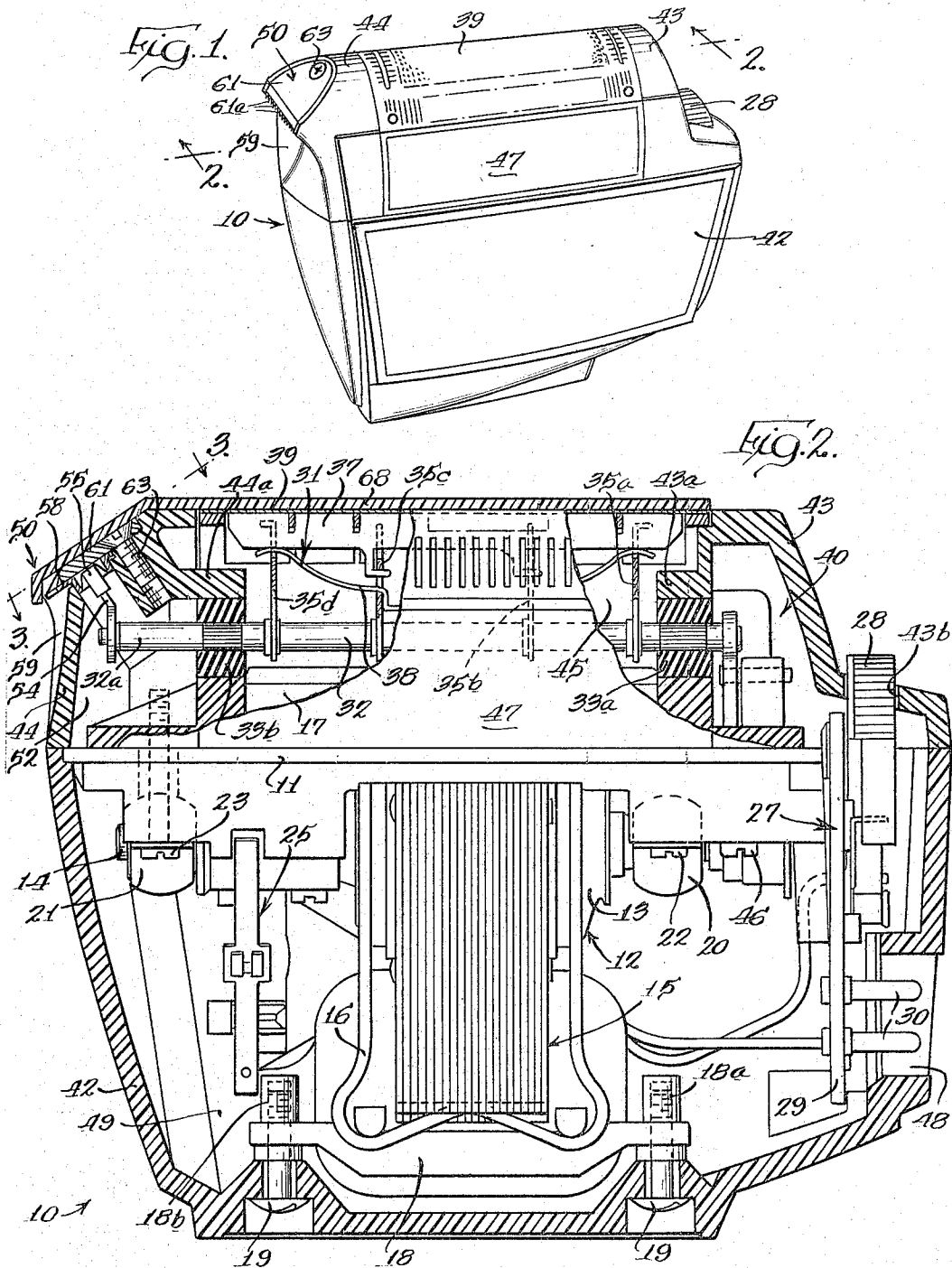
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3,290,774

ELECTRIC SHAVER WITH TRIMMER

Filed June 17, 1964

2 Sheets-Sheet 1



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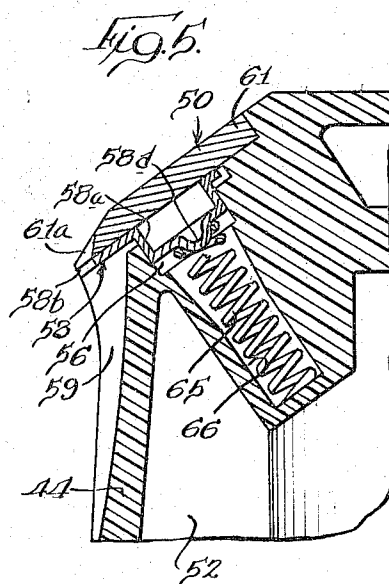
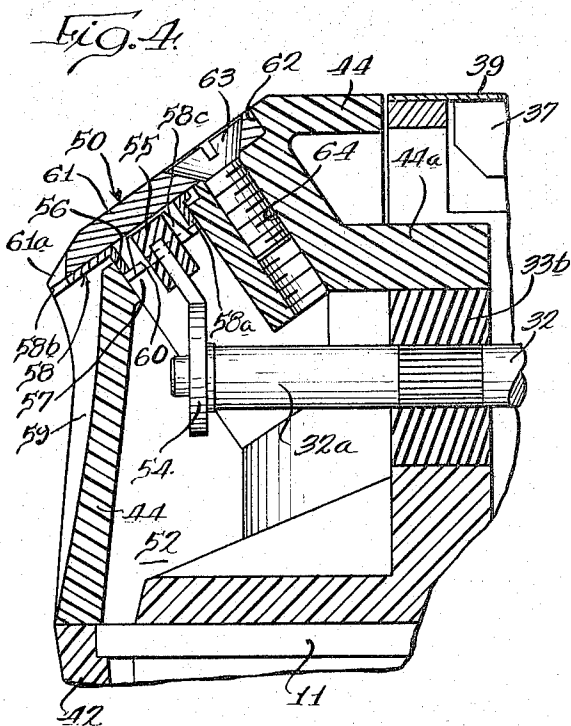
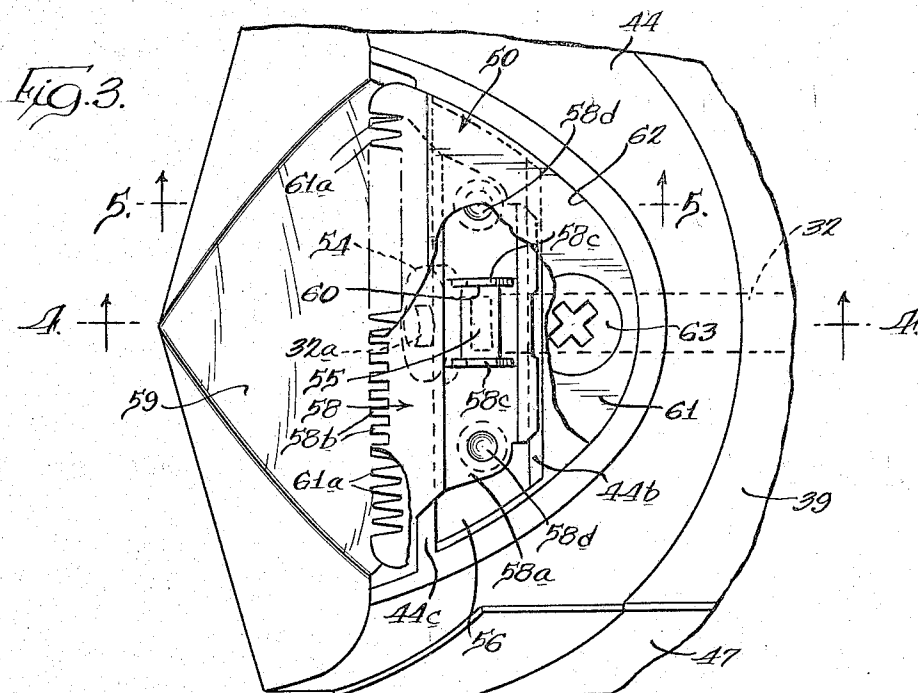
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ELECTRIC SHAVER WITH TRIMMER

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Filed June 17, 1964, Ser. No. 375,787

2 Claims. (Cl. 30—34.1)

The present invention relates to an electric shaver with means to trim sideburns or a mustache, leaving a straight, professional-looking, clean-shaven edge.

Electric shavers of the type comprising a hand-held unit including a self-contained electric motor which drives suitable cutting means have become widely accepted. Such electric shavers, particularly the oscillating cutter type, have done an exceptional job of removing facial hair. Unfortunately, electric shaves of this type are not well adapted to trim sideburns or mustaches in a manner to produce the desired professional look, and there is a need for an electric shaver which not only performs an ordinary shaving operation but which includes as an integral part thereof a barber type trimmer whereby complete grooming of the neck, nose, ears, sideburns and mustache can be accomplished.

Accordingly, it is an object of the present invention to provide a new and improved shaver capable of doing a complete grooming operation such as trimming mustaches, sideburns, long hairs, and the like.

It is another object of the present invention to provide a new and improved trimmer associated with an electric shaver capable of performing a cutting operation so as to leave a straight clean-shaven edge.

It is a further object of the present invention to provide a trimmer associated with an oscillating type shaver whereby the trimmer cutting edge is perpendicular to the longitudinal axis of the principal cutting area of the shaver.

Further objects and advantages of the present invention will become apparent as the following description proceeds and the features of novelty which characterize the invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

For a better understanding of the present invention, reference may be had to the accompanying drawings in which:

FIG. 1 is a perspective view of an electric shaver embodying the present invention with the comb guard removed;

FIG. 2 is an enlarged elevational view of FIG. 1, partly in section but with the comb guard in place, the portions in section being taken on line 2—2 of FIG. 1;

FIG. 3 is a greatly enlarged fragmentary view looking in the direction of the arrows 3—3 in FIG. 2 with the comb guard removed and certain portions broken away more clearly to illustrate the present invention;

FIG. 4 is a sectional view taken on line 4—4 of FIG. 3, assuming that FIG. 3 shows the complete structure; and

FIG. 5 is a sectional view taken on line 5—5 of FIG. 3, again assuming that FIG. 3 shows the complete structure.

Briefly, the present invention is concerned with an electric shaver of the oscillating blade type having a plurality of cutting blades driven and supported by a common shaft, and a trimmer for trimming sideburns or a mustache which is also driven directly from the same cutter shaft and comprising an integral part of the shaver. This trimmer functions in a manner somewhat like a barber's clippers.

In the drawings and the ensuing description the present invention has been illustrated as applied to an electric shaver embodying features disclosed and claimed in copending Jepson and Schuessler application Serial No. 109,551, filed May 12, 1961 which has matured into Patent No. 3,196,539, granted July 27, 1965, copending

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Jepson application Serial No. 237,239, filed November 13, 1962 which has matured into Patent No. 3,206,850, granted September 21, 1965, and copending Jepson et al. application Serial No. 322,795, filed November 12, 1963, all assigned to the same assignee as the present application. The features which are the subject matter of the above-mentioned copending applications will be described only sufficiently to understand the present invention.

Referring now to the drawings, there is illustrated an electric shaver generally designated at 10. As in the above-mentioned copending Jepson et al. application Serial No. 322,795, the electric shaver 10 comprises a mounting chassis 11 from which an electric motor generally designated at 12 is supported. This motor 12 comprises an armature 13 having an armature shaft 14, and a field structure generally designated at 15. The field structure 15 is secured to the chassis 11 by means of U-shaped bail clamps 16 suitably supported by a plastic bail hanger 17. The bight portion of the U-shaped bail clamps 16, as in the above-mentioned copending application Serial No. 322,795, supports a molded plastic hanger bracket 18 which includes a pair of internally threaded mounting bosses 18a and 18b for receiving mounting screws 19.

Also as in the above-mentioned copending Jepson et al. application Serial No. 322,795, the armature shaft 14 is mounted in suitable bearings which are clamped to the chassis 11 by bearing retainers 20 and 21 held by suitable screws 22 and 23, respectively. Preferably, a brush assembly generally designated at 25 is employed which may be identical with that disclosed and claimed in copending application Serial No. 322,795.

For the purpose of selectively controlling the electric motor 12, there is illustrated an electric switch generally designated at 27, including a switch actuating knob 28 which is preferably identical with that disclosed in copending Jepson and Schuessler application Serial No. 109,551 referred to above. This switch includes a suitable supporting insulating panel 29, also suitably mounted from the chassis 11, and supports suitable electrical terminals 30 by means of which electrical connection can be made through a suitable power cord, not shown.

Also associated with the chassis 11 is a cutting mechanism generally designated at 31 which preferably is very similar to that disclosed and claimed in copending Jepson application Serial No. 237,239 referred to above. The cutting mechanism 31 supported from the mounting chassis 11 includes a cutter shaft 32 which is bonded adjacent either end to resilient supporting material 33a and 33b of square block configuration receivable in upwardly directed recesses defined in integral projections of the mounting chassis 11, as fully described in the aforesaid Jepson copending application or the copending Jepson et al. application Serial No. 322,795. Also as in the above-mentioned copending applications, there is secured to the cutter shaft 32 an arm structure comprising a plurality of supporting arms 35a, 35b, 35c and 35d. Supported by the ends of the arms 35, such as 35a, 35b, 35c and 35d, are a plurality of cutter blades such as 37. In an embodiment built in accordance with the present invention, five cutter blades are provided, each of which is resiliently biased by a spring such as 38 into shearing engagement with an arcuate comb 39. The blade and arm structure could be identical or very similar to that shown in the aforementioned copending Jepson and Schuessler application.

For the purpose of drivingly connecting the cutter shaft 32 to the motor 12, a suitable drive mechanism generally designated at 40 is provided whereby rotary motion of the armature shaft 14 causes oscillation of the cutter shaft 32.

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In order to house the electric motor and all but the comb portion 39 of the cutting mechanism 31, there is provided a casing comprising cup-shaped section 42 and end caps 43 and 44, respectively. As in the above-mentioned copending Jepson et al. application Serial No. 322,795, each of the end caps 43 and 44 is provided with a suitable integral projection 43a and 44a for holding the resilient blocks 33a and 33b, respectively, in position in the above referred to upwardly directed recesses defined in integral projections of the mounting chassis 11. The end cap 43, like the corresponding end cap in the above-mentioned copending Jepson and Schuessler application Serial No. 109,551, is preferably provided with a suitable opening 43b to permit the switch actuating member 28 to project therethrough. This end cap 43, which may be designated the switch end cap, is secured to the chassis 11, so as to define one end of a cutting chamber, by suitable fastening means 46. The end cap 44, designated as the clipper or trimmer end cap, on the other hand, is secured to the mounting chassis 11 to define the other end of a cutting chamber 45 by the same fastening means 23 which hold the bearing retainer 21 to the chassis 11. The comb 39, as will be understood by those skilled in the art, is suitably held in position by comb locks 47, also disclosed in the copending applications referred to above. The entire subassembly comprising the cutting mechanism 31, the chassis 11, the end caps 43 and 44, the motor 12, the hanger bracket 18 and the comb locks 47 is then associated with the cup-shaped casing section 42, and by means of the fastening means 19 the casing section 42 is firmly secured to this subassembly. Casing section 42 is also preferably provided with a suitable opening 48 adjacent the terminals 30 so that electrical connection with a suitable power cord, not shown, can be made. This casing section 42 defines a motor chamber 49 for the motor 12. The arrangement described thus far forms no part of the present invention but is fully disclosed and claimed in the above-mentioned copending applications.

In accordance with the present invention, there is provided at one end of the shaver 10 a trimmer or clipper generally designated at 50 suitably associated with the clipper end cap 44. In accordance with the present invention, the cutter shaft 32 is provided with an extension 32a extending beyond the resilient support 33b (to the left thereof, as viewed in FIG. 2 of the drawings). This extension 32a is housed in a chamber 52 defined by the clipper end cap 44. Secured to the end of the extension 32a of oscillating shaft 32 is a clipper driving lever 54. Preferably a molded nylon force transmitting member 55 is secured to the free end of lever 54. The driving end of lever 54 and associated member 55 extend into an elongated recess 56 which is connected with the chamber 52 by an opening 57.

In accordance with the present invention, there is disposed in the elongated recess 56 for reciprocal movement in the direction of the longitudinal axis of this recess a channel or U-shaped projection 58a of a clipper cutter 58 which has a plurality of cutting teeth 58b projecting beyond the end cap 44, as best shown in FIGS. 4 and 5 of the drawings. Preferably the clipper end cap 44 is provided with a recess 59 beneath the cutting teeth 58b of the cutter 58.

The U-shaped elongated channel portion 58a of the clipper cutter 58 is provided with suitable guiding means which overlie surfaces 44b and 44c (FIG. 3) defined on either side of recess 56. Channel portion 58a is guided in its reciprocal movement by the walls of recess 56, as best shown in FIGS. 3, 4 and 5 of the drawings. Channel portion 58a is also provided with a central opening 60 defined at the ends by thrust receiving projections 58c for engaging the member 55 on the end of the clipper lever 54 whereby oscillating motion of the cutter shaft 32 will cause reciprocation of the clipper cutter 58.

In order to make cutting engagement with the clipper cutter 58, there is provided a clipper comb 61 which is in

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the shape of a truncated parabola with a plurality of teeth 61a defined across the truncated end thereof. The clipper end cap 44 is preferably provided with a recess 62 of the same shape to receive the comb 61 in superimposed relationship over the cutter 58 and a suitable fastening means 63 holds the comb in position, the fastening means 63 being threadably engaged with a tapped opening 64 defined in the end cap 44.

To bias the clipper cutter 58 into shearing engagement with the comb 61, a plurality of coiled compression springs 65 are provided which are disposed in a pair of spring receiving recesses 66 defined in the end cap, one of which is best shown in FIG. 5 of the drawings. Preferably the bight portion of channel-shaped portion 58a of the clipper cutter 58 is provided with dimples or protuberances 58d receivable in the adjacent end of the compression springs 66 thereby to hold the springs 66 in a predetermined association with the clipper cutter 58.

In view of the detailed description included above, the operation of the shaver 10 of the present invention and particularly the trimmer portion 50 thereof will readily be understood by those skilled in the art. It will be apparent that the common cutter shaft 32 oscillates the blades 37 in shearing engagement with the comb 39, the comb extending along one edge of a somewhat rectangular-shaped housing of a size so as to be readily cupped in the hand of the user. The trimmer unit 50 comprises a linear cutting edge which is perpendicular to the longitudinal axis of the comb 39. By virtue of the recess 59, the clipper projects sufficiently beyond the edge of the casing so as to be readily usable to trim mustaches, sideburns and the like. In fact the trimmer 50 works substantially identical with a barber's clippers and makes it easy to do a complete grooming job of the neck, nose, ears and sideburns, the regular cutting portion of the shaver 10 taking care of the normal shaving operation.

To protect both the comb 39 and the trimmer portion 50, a comb guard 68 may be employed which is readily attached and removed in a well understood manner.

While there has been illustrated and described a particular embodiment of the present invention, it will be apparent to those skilled in the art that various changes and modifications may be made without departing from the invention in its broader aspects, and it is, therefore, contemplated in the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.

What is claimed as new and desired to be secured by Letters Patent of the United States is:

1. An electric dry shaver comprising a generally rectangular casing defining a handle portion with a cutting surface along one edge of said casing, a rotary motor supported in said casing, a cutter shaft, mounting means supporting said cutter shaft parallel to said edge for oscillating movement about its longitudinal axis, drive means connected to said motor and engaging one end of said cutter shaft for imparting rotary oscillatory movement to said cutter shaft, cutting means defining said cutting surface including a perforate comb surface and a blade mounted on said cutter shaft for oscillatory movement against said comb surface, clipping means disposed at a corner of said casing adjacent one end of said cutting surface, said clipping means including a toothed comb disposed along a line generally normal to said edge, said clipping means additionally including a toothed cutter mounted for reciprocal movement while disposed in shearing relationship with said toothed comb, means including a drive lever mounted on the other end of the cutter shaft for driving said toothed cutter, a pair of spaced openings in said casing flanking said drive lever, protuberances on said toothed cutter over said openings, and springs mounted in said openings and engaging said protuberances for holding said toothed cutter against said toothed comb.

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2. An electric dry shaver comprising a generally rectangular casing having a handle portion and an end cap, a cutting surface along one edge of said casing adjacent said end cap, a cutter shaft, mounting means supporting said cutter shaft parallel to said edge for oscillatory movement about its longitudinal axis, cutting means including a perforate comb having a part of said cutting surface and a blade mounted on said cutter shaft for oscillatory movement adjacent said comb surface, means defining an enlarged cavity in said end cap, clipping means disposed on said end cap and including a toothed comb over said cavity disposed along a line generally normal to said edge, said clipping means including a toothed cutter mounted for reciprocal movement between said end cap and said toothed comb, said toothed cutter including a recessed portion received in said cavity, a drive lever mounted on said cutter shaft within said cavity and engaging said recessed portion for translating the oscillating movement of said cutter shaft into reciprocal movement of said

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toothed cutter, and tensioning means including spring means compressed between said end cap and said toothed cutter for biasing said toothed cutter against said toothed comb.

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