

PATENT SPECIFICATION

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DRAWINGS ATTACHED

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(54) ELECTRIC CUTTER MEANS FOR ELECTRIC DRY SHAVERS

(71) We, SPERRY RAND CORPORATION, a corporation organized and existing under the laws of the State of Delaware, of 1290 Avenue of the Americas, New York, New York 10019 United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to new and useful improvements in electric dry shavers and particularly to shavers used by women.

Electric dry shavers of the latter type are used by women to remove hair bristles from the legs and underarms by means of suitable cutter means. In most shavers the cutter means comprise at least a stationary outer cutter within which is disposed a cooperating movable inner cutter. Hair reception slots are provided in the outer cutter and through which slots the hair bristles are combed and then sheared by the cutter teeth of the movable inner cutter. It is well known that the thinner the skin contacting portions of the outer cutter are made, the closer to the skin the hair bristles will be removed. Conversely, however, irritating effects often result at sensitive skin areas as the thickness of the contacting portions are reduced. Problems are encountered therefore in providing a woman's shaver wherein the cutter means is suitable for use both on the legs and underarms. If the outer cutter of the cutter means is made to thin dimensions for effective use on the less sensitive legs having relatively coarse hair, the same surface if used on the underarms having finer hair and more sensitive skin might cause the aforementioned irritating effects.

Various means have been used in the past to attempt to counteract these reactions. Some women's shavers for example have been provided with adjustable guard members or the like wherein the guards are moved to various positions relative to the cutter head in accordance with the intended shaving operation. The guards serving to tension and hold the skin a further distance

away from the cutter head in accordance with the adjusted position of the guards during underarm shaving than when the legs are shaved in accordance with the desired needs of the user. In other shaving devices different portions of the cutter head are adapted for use on the legs and the underarms. The latter involve care on the user's part that the thinner portions used for the legs not be inadvertently used under the arms.

The present invention contemplates an auxiliary cutter head assembly for an electric dry shaver. The auxiliary cutter head assembly comprises an assembly casing having cutter means mounted on one end with means on the other end for mounting the assembly casing on the shaver operating means. Motion transmitting means are provided within the auxiliary casing adapted to operatively connect the cutter means thereof to the operating means of the shaver.

According to the present invention there is provided a cutter head assembly including a casing for attachment to an electric dry shaver body of the type having a casing, motor and motor driven operating means, the shaver body and assembly being adapted to permit removal of the assembly for replacement by an alternative assembly for a different mode of shaving, the assembly comprising: (a) an assembly casing having one end adapted to be mounted on said shaver casing with most of the assembly projecting beyond said shaver casing; (b) cutter means on the opposite end of the assembly casing and including a movable cutter and a stationary cutter; and (c) motion transmitting means in said assembly casing adapted for connection to the motor driven operating means to transmit motion to said movable cutter; which motion transmitting means comprises:

(1) a driven member including a drive arm and means pivotally mounting said drive arm on said assembly casing;

(2) means mounting said driven member for movement within said assembly casing; and

(3) means adapted to connect said driven

member to the motor driven operating means in said shaver casing and comprising spring means connected to said driven member.

5 To illustrate the present invention and to show how it may be put into effect, reference will now be made by way of example, to the accompanying drawings, in which:

10 Figure 1 is a perspective view of the upper portion of a known type electric dry shaver having a multiple cutter head unit assembly mounted thereon;

15 Figure 2 is a fragmentary front elevational view of the shaver of Figure 1 with the multiple cutter head unit assembly removed and with the cutter head assembly incorporating the present invention mounted thereon;

20 Figure 3 is a fragmentary partly cross sectional enlarged elevation view of the shaver and the cutter head assembly of the invention on line 3-3 of Figure 4;

Figure 4 is a sectional view taken on the line 3-3- of Figure 3;

25 Figure 5 is an exploded perspective view of the shaver and the cutter head assembly of the invention;

Figure 6 is a perspective view of the motion transmitting member; and

30 Figure 7 is a plan view of the cutter means receptacle of the cutter head assembly of the invention with the cutter means removed.

35 Figure 1 shows the upper portion of an electric dry shaver which is generally indicated by the reference numeral 10. Electric dry shaver 10 is of a well-known type and includes a casing 13 having a cutter head receptacle 11 (shown in Figure 5) in the upper portion thereof in which is disposed a cutter head assembly 12 partially shown in Figure 1. Cutter head assembly 12 includes a pair of cutter head units 14 and 15 disposed in side by side relation and both of which cutter head units 14-15 are of the general type shown and described in British Patent No. 798757 to the present applicant dated 45 January 26, 1956. Each cutter head unit 14-15 comprises a stationary outer cutter 17 (Figure 1) within which is disposed an inner cutter (one partially shown and indicated at 18 in Figure 1). Cutter head assembly 12 is held within cutter head receptacle 11 by a pair of spaced manually operable latch members 20 (Figures 3 and 5) of the type disclosed in British Patent No. 1,218,517 to Sperry Rand Corporation dated January 6, 1971, and 55 which latches 20 are readily displaceable for releasing the cutter head assembly 12 from receptacle 11. Each inner cutter 18 of cutter head assembly 12 is adapted to be driven by an oscillator arm 22 and 23 (Figures 3, 4 and 5) which extend into cutter head receptacle 11 from a motor compartment 24 in shaver 10. A motor partially shown and diagrammatically indicated at 25 in Figure 3 of a conventional vibratory type is provided in compartment 24

for imparting oscillatory motion to arms 22 and 23. 65

The structure thus far described represents structure as found in one known type woman's electric dry shaver. In use the multiple cutter head units 14-15 of the cutter head assembly 12 are effective to removal of hair from legs as a result of the large cutting surface area represented by the skin contacting surface of the outer cutters 17. Conversely in use of this type cutting surface on the underarms the disadvantages previously mentioned are apt to be encountered. 70 75

As mentioned it is a feature of this invention to provide auxiliary cutter head means for substitution in place of cutter head assembly 12 as desired for use in the removal of hair from the underarm areas. To this end an auxiliary cutter head assembly is provided in a casing indicated by reference numeral 28 in Figures 2, 3, 4 and 5. Cutter head casing 28 includes a pair of oppositely formed casing sections 29 and 30 respectively (Figures 4 and 5) and each of which sections are formed oppositely of the other of moulded plastics and are constructed so that the free edges of one is adapted to engage the edges of the other section to provide a complete casing. 80 85 90

A cutter head receptacle 31 comprising a recessed portion in the upper portion of casing 28 is provided for receiving a single cutter head unit indicated by the reference numeral 32. 95

Cutter head unit 32 includes an inverted elongated U-shaped outer cutter 33 having opposite side wall portions secured to the arms of a U-shaped base spacer 34. An inner cutter 35 of the general type shown is disposed within outer cutter 33 and is urged into cutting co-operation with outer cutter 33 by a leaf spring 36 (Figure 3) which has its arms connected to the ends of inner cutter 35. The opposite longitudinal edges (Figure 4) of outer cutter 33 are spaced in a known manner from the adjacent edges of inner cutter 35 as indicated at 37 in Figure 4 to provide a comb edge for leading hair into the hair reception slots 38 of outer cutter 33 by spacing the skin from the inner cutter 35 in a manner suitable for removal of fine hair from the underarm areas. 100 105 110 115

A bottom wall 40 of cutter head receptacle 31 (Figures 3 and 4) is provided by the engagement of sections 29 and 30. A plate member 41 having a depending clamp finger 42 at each corner thereof is disposed on the bottom wall 40 with clamp fingers 42 inserted in apertures 43 provided in wall 40 and which clamping fingers 42 hold casing sections 29 and 28 in assembled condition. 120

Latch means for holding cutter unit 32 in receptacle 31 (Figure 3) are provided at opposite ends of receptacle 31 and include latch members 44 pivotally mounted on bosses 45. One end of latch member 44 125

is provided with a hook portion 46 in engagement with the adjacent bight portion of base spacer 34 of cutter head 32. Resilient fingers 47 of plate 41 extend outwardly from plate 41 and engage portions 48 of latches 44 to maintain the latches in latching engagement with the cutter head. A manually manipulable portion 49 of each latch 44 projects outwardly of casing 28 through slot 50.

Means for transmitting motion to inner cutter 35 are included in casing 28 and are indicated by the reference numeral 52 (Figures 3 and 6). The latter means comprise a moulded plastics member having a central hollow shaft portion 53 mounted for pivotal movement on a pin 54 which has its ends journaled in wall 40 of casing 28. A drive arm 55 extends from shaft 53 and engages a drive portion 56 of a spring 36. Further a drive leaf spring 58 is secured by suitable means such as rivets 59 to the bottom of the plastics driven member and is provided with a bowed central portion 60.

Auxiliary cutter head assembly 32 is mounted on shaver casing 13 after the previously described cutter head assembly 12 has been removed from receptacle 11 by inserting casing 28 into cutter head receptacle 11 (Figure 5). The opposite lower longitudinally extending edges 61-62 of casing 28 are formed to mate with and rest on the edges of casing 13. The opposite lower end portions of casing 28 (Figures 3 and 5) are provided with recessed ledge portions 63 disposed within receptacle 11. Latch members 20 in shaver 10 are adapted to engage ledges 63 and maintain casing 28 securely to casing 13. In latched engagement of casing 28 to casing 13 bowed portion 60 of spring 58 of motion transmitting means 52 engages the tip of oscillator arm 23 of motor 25. During operation of motor 25, motion transmitting spring 58 is thereby oscillated by arm 23 to cause drive arm 55 to oscillate in the direction of arrows A and B (Figure 3) to convert the oscillatory motion thereof to reciprocatory motion of the inner cutter 35 in cutter means 32.

If desired the position of casing 28 can be rotated 180° from the position shown in Figure 3 and bowed portion 60 in spring 58 will engage oscillator arm 22 to operate cutter means in the same manner as above described. Further if it is desired to release casing 28 from shaver casing 13, latching members 20 are depressed to release the hook portions thereof from ledges 63 whereby casing 28 can be removed from cutter receptacle 11. If it is desired to release cutter means 32 from casing 28, the latter is released by depressing portion 49 of latch members 44 to release hooks 46 from the ends of the base spacer 34. Cutter means 32 may be reinserted in receptacle 31 by inserting it into the cutter

receptacle 31 and camming the cutter into latched engagement with latch members 44 as described.

It is apparent from the foregoing that the cutter head assembly of the invention has many advantages in use. One advantage is that the elongated casing 28 provides readily manipulable means for traversing the under-arm areas to provide a comfortable and efficient hair removal operation. The separate cutters for different modes of shaving resulting in optimum performance of each without lessening of efficiency.

Although one embodiment of the present invention has been illustrated and described in detail it is to be specifically understood that the invention is not limited thereto. Various changes can be made in the design and arrangement of parts without departing from the scope of the invention as defined in the appended claims.

By these means, there is provided an electric dry shaver having one cutter head for one shaving mode and a cutter head assembly of the invention as described above for accomplishing another mode of shaving.

This above-described cutter head assembly of the invention for an electric dry shaver serves as an extension of the shaver and is adapted to accomplish a selected mode of shaving and is readily mounted on the shaver, and includes motion transmitting means adapted for connection to the operating means of the shaver.

WHAT WE CLAIM IS:—

1. A cutter head assembly including a casing for attachment to an electric dry shaver body of the type having a casing, motor and motor driven operating means, the shaver body and assembly being adapted to permit removal of the assembly for replacement by an alternative assembly for a different mode of shaving, the assembly comprising:

- (a) an assembly casing having one end adapted to be mounted on said shaver casing with most of the assembly projecting beyond said shaver casing,
- (b) cutter means on the opposite end of the assembly casing and including a movable cutter and a stationary cutter, and
- (c) motion transmitting means in said assembly casing adapted for connection to the motor driven operating means to transmit motion to said movable cutter;

which motion transmitting means comprises:

- (1) a driven member including a drive arm and means pivotally mounting said drive arm on said assembly casing;
- (2) means mounting said driven member for movement with said assembly casing; and
- (3) means adapted to connect said driven member to the motor driven operating means

is provided with a hook portion 46 in engagement with the adjacent bight portion of base spacer 34 of cutter head 32. Resilient fingers 47 of plate 41 extend outwardly from plate 41 and engage portions 48 of latches 44 to maintain the latches in latching engagement with the cutter head. A manually manipulable portion 49 of each latch 44 projects outwardly of casing 28 through slot 50.

Means for transmitting motion to inner cutter 35 are included in casing 28 and are indicated by the reference numeral 52 (Figures 3 and 6). The latter means comprise a moulded plastics member having a central hollow shaft portion 53 mounted for pivotal movement on a pin 54 which has its ends journaled in wall 40 of casing 28. A drive arm 55 extends from shaft 53 and engages a drive portion 56 of a spring 36. Further a drive leaf spring 58 is secured by suitable means such as rivets 59 to the bottom of the plastics driven member and is provided with a bowed central portion 60.

Auxiliary cutter head assembly 32 is mounted on shaver casing 13 after the previously described cutter head assembly 12 has been removed from receptacle 11 by inserting casing 28 into cutter head receptacle 11 (Figure 5). The opposite lower longitudinally extending edges 61-62 of casing 28 are formed to mate with and rest on the edges of casing 13. The opposite lower end portions of casing 28 (Figures 3 and 5) are provided with recessed ledge portions 63 disposed within receptacle 11. Latch members 20 in shaver 10 are adapted to engage ledges 63 and maintain casing 28 securely to casing 13. In latched engagement of casing 28 to casing 13 bowed portion 60 of spring 58 of motion transmitting means 52 engages the tip of oscillator arm 23 of motor 25. During operation of motor 25, motion transmitting spring 58 is thereby oscillated by arm 23 to cause drive arm 55 to oscillate in the direction of arrows A and B (Figure 3) to convert the oscillatory motion thereof to reciprocatory motion of the inner cutter 35 in cutter means 32.

If desired the position of casing 28 can be rotated 180° from the position shown in Figure 3 and bowed portion 60 in spring 58 will engage oscillator arm 22 to operate cutter means in the same manner as above described. Further if it is desired to release casing 28 from shaver casing 13, latching members 20 are depressed to release the hook portions thereof from ledges 63 whereby casing 28 can be removed from cutter receptacle 11. If it is desired to release cutter means 32 from casing 28, the latter is released by depressing portion 49 of latch members 44 to release hooks 46 from the ends of the base spacer 34. Cutter means 32 may be reinserted in receptacle 31 by inserting it into the cutter

receptacle 31 and camming the cutter into latched engagement with latch members 44 as described.

It is apparent from the foregoing that the cutter head assembly of the invention has many advantages in use. One advantage is that the elongated casing 28 provides readily manipulable means for traversing the under-arm areas to provide a comfortable and efficient hair removal operation. The separate cutters for different modes of shaving resulting in optimum performance of each without lessening of efficiency.

Although one embodiment of the present invention has been illustrated and described in detail it is to be specifically understood that the invention is not limited thereto. Various changes can be made in the design and arrangement of parts without departing from the scope of the invention as defined in the appended claims.

By these means, there is provided an electric dry shaver having one cutter head for one shaving mode and a cutter head assembly of the invention as described above for accomplishing another mode of shaving.

This above-described cutter head assembly of the invention for an electric dry shaver serves as an extension of the shaver and is adapted to accomplish a selected mode of shaving and is readily mounted on the shaver, and includes motion transmitting means adapted for connection to the operating means of the shaver.

WHAT WE CLAIM IS:—

1. A cutter head assembly including a casing for attachment to an electric dry shaver body of the type having a casing, motor and motor driven operating means, the shaver body and assembly being adapted to permit removal of the assembly for replacement by an alternative assembly for a different mode of shaving, the assembly comprising:

(a) an assembly casing having one end adapted to be mounted on said shaver casing with most of the assembly projecting beyond said shaver casing,

(b) cutter means on the opposite end of the assembly casing and including a movable cutter and a stationary cutter, and

(c) motion transmitting means in said assembly casing adapted for connection to the motor driven operating means to transmit motion to said movable cutter;

which motion transmitting means comprises:

(1) a driven member including a drive arm and means pivotally mounting said drive arm on said assembly casing;

(2) means mounting said driven member for movement with said assembly casing; and

(3) means adapted to connect said driven member to the motor driven operating means



in said shaver casing and comprising spring means connected to said driven member.

2. The assembly of Claim 1 wherein said means pivotally mounting said drive arm on said assembly casing is a shaft member with said drive arm extending from said shaft member into engagement with a drive portion of the aforesaid connecting means connected to said movable cutter, said spring means connecting the driven member to motor driven operating means comprising a leaf spring having one end connected to said driven member, a free end and a bowed mid-portion adapted for connection to the motor driven operating means when the assembly casing is mounted on said shaver.

3. The assembly of any previous Claim wherein said assembly casing includes a pair of complementary mating sections, a cutter head receptacle in one end of the aforesaid mating sections for said cutter means and a compartment at the opposite end for said connecting means.

4. The assembly of Claim 3 wherein means are provided in said assembly casing for detachably mounting said cutter means in said receptacle on said motion transmitting means.

5. The assembly of Claim 3 or Claim 4 wherein the outer edge portions of the walls forming said compartment at the end nearer to said connecting means are of complemen-

tary configuration to the engaged portions of said shaver casing whereby said assembly casing forms an extension thereof when mounted on the shaver casing.

6. The assembly of any previous claim wherein said motor driven operating means includes a pair of oscillator arms and wherein said motion transmitting means in said assembly casing is adapted for connection to either of said arms for transmitting motion to said movable cutter.

7. The assembly of Claim 6 wherein said assembly casing includes means for latching said assembly casing to cutter head attachment means of said shaver casing.

8. An electric dry shaver having one cutter head assembly for one shaving mode and a cutter head assembly as claimed in any of Claims 1 to 7 for accomplishing another mode of shaving.

9. A cutter head assembly for an electric dry shaver as claimed in claim 1, substantially as hereinbefore described with reference to Figures 2-7 of the accompanying drawings.

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