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(54) IMPROVEMENTS IN ELECTRIC DRY SHAVERS

(71) We, SPERRY RAND CORPORATION a Corporation organised under the laws of the State of Delaware, United States of America of 1290 Avenue of the Americas, New York 19, New York, 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 improvements in electric dry shavers having a cutter head attachment and release apparatus.

In electric dry shavers it is the usual practice to provide means for detachably mounting the cutter head assembly on the shaver casing in a manner whereby the cutter head is readily removable when desired for cleaning, servicing or replacement. In some electric dry shavers, for example, the cutter head is disposed within a recessed portion or cutter head receptacle provided in the casing with the exposed top surface of the cutter head arranged substantially flush with the adjacent exterior wall portions of the casing. As a result the cutter head is difficult to grasp with one's fingers to remove the same from the casing. In the latter type shavers various attachment means have been provided in the past for securing the cutter head assembly to the casing in a manner whereby the cutter head is adapted to be released or partially ejected from the cutter head receptacle through actuating means which are manually operable at the exterior of the casing. Although known means for accomplishing these ends have proven satisfactory in use, they require relatively complex structure comprised of a multiplicity of parts which not only increase the cost of the shaver but also result in increased assembly and manufacturing procedures. In addition these known mechanisms require excessive space within the shaver casing for operation in proportion to other mechanisms and thereby increase the size of the shaver and limit the space needed for other mechanisms of the shaver.

According to the invention there is provided an electric dry shaver having a cutter head

attachment and release apparatus comprising a cutter head receptacle provided in the casing of the shaver, a cutter head assembly disposed within the receptacle, latch means on the casing for maintaining the cutter head assembly in the receptacle, the latch means including a pair of spaced levers, means pivotally mounting the levers on the casing, latch hooks provided on the levers and extending into the cutter head receptacle and resilient means within the casing engaging the levers and biasing the latch hook portions into latching engagement with the cutter head assembly.

In one embodiment thereof the cutter head assembly comprise a movable inner cutter disposed within a stationary outer cutter and which cutter head assembly is adapted to be maintained within a cutter head receptacle at one end of the shaver casing by the attachment means. The latter means comprising a pair of sheet-like metal plate levers pivotally mounted at opposite sides of the receptacle and which levers each include a latch hook portion in engagement with the cutter head assembly. Resilient means are provided within the receptacle engaging other portions of the levers to bias and maintain the latch hooks in engaged position. The levers are further adapted for manual manipulation from without the casing to release the latch hook portions from the cutter head whereby the cutter head is released from the casing.

The above and other objects and advantages of the present invention will appear more fully hereinafter from a consideration of the detailed description which follows taken together with the accompanying drawing wherein a preferred embodiment of the invention is illustrated.

In the drawing:

FIG. 1 is a fragmentary partly cross sectional elevation view of an electric dry shaver incorporating the present invention;

FIG. 2 is a plan view of the shaver with the cutter head assembly removed and illustrates a portion of the attachment means;

FIG. 3 is a sectional view taken on the line 3—3 of FIG. 2; and

FIG. 4 is a perspective fragmentary end

views of the cutter head assembly in one of the lever members.

Referring now to the drawings for a more detailed description of the present invention, the upper portion of an electric dry shaver casing is generally indicated by the reference numeral 10 in FIGS. 1 and 2. Electric shaver 10 is made in two opposite shaver casing sections 11 and 12 respectively (partly shown in FIGS. 2 and 3) and each of which sections 11 and 12 are formed oppositely to the other of molded plastic. Each casing section 11 and 12 includes a sidewall 13 together with laterally extending spaced endwalls 14 projecting in the same direction from sidewall 13. Endwalls 14 of casing section 11 are constructed so that the free edges thereof engage the corresponding edges of endwall 14 of casing section 12 to provide a complete shaver casing.

A cutter head receptacle 17 comprising a recessed portion in casing 10 is provided for receiving therein a cutter head assembly generally indicated by the reference numeral 18. A wall portion 20 (FIGS. 1 and 2) formed by the joined casing sections 11 and 12 provides the bottom wall of cutter head receptacle 17. As seen in FIGS. 1, 2 and 3 a pair of spaced and parallel rib members 19 are formed on bottom wall 20 and extend longitudinally of the receptacle 17. A rectangular metal plate 21 is mounted over ribs 19 (FIGS. 1 and 3) and is provided with depending resilient clamp legs 22 at the corners thereof. Clamp legs 22 are disposed in apertures 23 in bottom wall 20 and engage the edges of apertures 23 to maintain the upper portion of mated casing sections 11 and 12 in engagement.

Wall portion 20 in addition separates the cutter head receptacle 17 from a motor compartment 24 in casing 10. A shaver motor in FIG. 2 partly shown and diagrammatically indicated at 25 in FIG. 2 of any conventional type, for example a vibratory motor, is mounted in motor compartment and is provided with oscillator arms 27 which project upwardly through apertures 28 (FIG. 1) in wall 20 into cutter head receptacle 17.

Cutter head assembly 18 as illustrated is disposed in receptacle 17 and has exposed portions arranged substantially flush with the upper edges of casing 10 and includes two individual cutter head units 30—32 that are identical to each other and which units are of a well known structure. Cutter head units 30—32 are disposed in side-by-side relationship on a substantially rectangular mounting plate 33. Each cutter head unit 30—32 includes an inverted U-shaped outer cutter 34 having opposite side wall marginal portions secured to the arms of a U-shaped base spacer member 35. An inner cutter 36 of the general type shown and described in U.S. Patent No. 2,793,430 issued on May 28, 1957 to L. C. Carissimi is disposed within each outer cutter 34 and is urged against the outer cutter 34

by a leaf spring 37 partially shown in FIGS. 2 and 3. Suitable fastening means such as for example clamps 38 partially shown in FIG. 4 are provided at opposite ends of cutter head assembly 18 and have portions engaging the bottom of mounting plate 33 and cutter head units 30—32 to secure cutter head units 30—32 on plate 33 in a known manner. In addition an inverted U-shaped skin engaging member 40 is disposed between cutter head units 30—32 on plate 33 and is secured thereto by suitable fastening means.

Cutter head assembly 18 is disposed in cutter head receptacle 17 and seated upon a hair stopper or sealing member 42 made of a suitable flexible foam material which is disposed over clamping plate 21 to prevent hair clippings from entering motor compartment 24 in a known manner. Oscillator arms 27 of motor 25 project through aligned openings 28 in wall 20, clamping plate 21, stopper 42, and openings 44 in base spacers 35 to engage leaf springs 37 of inner cutter 36 in a usual manner to bias springs 37 towards the outer ends of their associated inner cutters 36 to urge the cutters 36 into cutting cooperation with outer cutters 34.

As mentioned it is the feature of this invention to provide means for attaching cutter head assembly 18 to shaver casing 10 within receptacle 17. To this end lever means are provided and include a pair of spaced thin sheet-like metal plate members 48 and 49 FIG. 1 disposed at opposite sides of receptacle 17. Each plate member 48—49 comprises a substantially Y-shaped body portion arranged in a cutout portion 11a of casing section 1 and pivotally mounted on a boss 51 (FIG. 2) formed on edges of section 11 of casing 10. Each boss 51 is disposed in an aperture 52 of its associated lever 48—49 with the latter held in position thereon by the engaging of casing section 12 with the ends of bosses 51 (FIG. 2).

A latch hook 54 is formed on one arm of levers 48—49 and which hooks project into receptacle 17. The legs 55 of levers 48—49 project outwardly of casing 10 through apertures 15 and provide means for manually actuating levers 48—49 in a manner to be described. As seen in FIG. 1 casing clamp plate 21 is provided with resilient fingers 57 extending from recesses in the transverse edges (FIG. 2) of plate between ribs 19 on wall 20. Each resilient finger 57 engages on arm 58 of levers 48—49 to bias latch hook portions 54 into engagement with and over detent lugs 62 provided on the transverse edges of mounting plate 33 of cutter head assembly 18 to securely fasten the cutter head assembly 18 to shaver 10.

Under conditions where the cutter head assembly 18 is mounted on casing shaver 10 in the manner described (FIG. 2) and a person desires to release the cutter head assembly 18 from casing 10 he manually presses actuating leg portions 55 of levers 48—49 inwardly,

thereby rotating levers 48—49 counter-clockwise and clockwise respectively (FIG. 2) about bosses 51. As levers 48—49 are rotated latch hook portions 54 thereon disengage detent lugs 62 on mounting plate 33 of cutter head assembly 18. As levers 48—49 are rotated to the position shown in broken lines in FIG. 2, latch portions 54 disengage mounting plate 33 and the tension of inner cutter drive springs 37 is relaxed and the cutter head is released outwardly of receptacle 17 to the position shown in broken line form FIG. 3 whereat the cutter head assembly 18 may be readily grasped and withdrawn therefrom by one's fingers.

If it is desired to replace cutter head assembly 18 in receptacle 17 the same is inserted therein until detent lugs 62 on plate 33 engage latch portions 54. Slight downward pressure then applied to cutter head 18 cams latch hooks 54 against the bias of resilient fingers 57 into latching engagement with lugs 62. As cutter head 18 is released latch hooks 54 firmly hold the same in position within receptacle 17 in a manner previously described.

Latch hook arm portions 54 of levers 48—49 under the bias of the resilient fingers 57 against arms 58 thereof securely latch and maintain cutter head assembly 18 in position in receptacle 17. As will be readily understood by those skilled in the art, the sheet-like nickel plate levers 48—49 if desired may be of varying configuration or engage other portions of cutter head in assembly 18.

It will be further apparent from the foregoing description that the novel attachment means described has many advantages in use. One advantage is that relatively simple and uncomplicated structure is provided for securely maintaining the cutter head position. Further the disclosed attachment means requires limited area of operation in moving from latched to unlatched positions. The thin, sheet-like metal plates lever members 48—49 occupy only a minimum amount of space in casing 10 and do not interfere with other parts or mechanisms of the shaver.

WHAT WE CLAIM IS:—

1. An electric dry shaver having a cutter head attachment and release apparatus, comprising a cutter head receptacle provided in the casing of the shaver, a cutter head assembly disposed within the receptacle, latch means on the casing for maintaining the cutter head assembly in the receptacle, the latch means including a pair of spaced levers, means pivotally mounting the levers on the casing, latch hooks provided on the levers and extending into the cutter head receptacle and resilient means within the casing engaging the levers and biasing the latch hook portions into latching engagement with the cutter head assembly.

2 A shaver as claimed in Claim 1 wherein

the lever members comprise sheet-like metal plate members disposed at opposite sides of the cutter head receptacle, each of the sheet-like metal plate members having a first portion projecting outwardly of the casing, with the latch hook provided on a second portion thereof, the first portions of the levers being manually operable from without the casing for rotating the levers on the pivot means to disengage the latch hook portions from the cutter head assembly.

3. A shaver as claimed in Claim 1 or Claim 2 wherein each of the levers is of substantially Y-shaped configuration, the latch hook being provided on one arm of the Y, the other arm of the Y being in engagement with the resilient means and the leg of the Y projecting outwardly of the casing to provide means for manually rotating the levers on the pivot means.

4. A shaver as claimed in any of the preceding Claims wherein the resilient means includes a plate member, means supporting the plate member within the receptacle and resilient fingers extending from the plate to engage the levers and to bias the latch hooks into engagement with the cutter head assembly.

5. A shaver as claimed in Claim 4 wherein the support means for the plate member comprise a pair of spaced and parallel rib members extending longitudinally of the base of the cutter head receptacle, the resilient fingers extending from the spaced transverse edges of the plate between the ribs to engage their associated levers.

6. A shaver as claimed in any of the preceding Claims wherein the pivot means comprise apertures provided in the levers and bosses formed on the casing inserted in the apertures for supporting the levers for rotation thereon.

7. A shaver as claimed in any of the preceding Claims wherein the cutter head assembly comprise an inner and an outer cutter mounted upon a mounting plate, the lug means being provided on the mounting plate, and the latch hooks being adapted to engage the lugs in a first position to detent the cutter head assembly to the casing.

8. A shaver as claimed in Claim 7 wherein spring means are provided to maintain the inner cutter in engagement with said outer cutter, such spring means being operable to release the cutter head from the receptacle when the latch hooks are moved to a second position.

9. An electric dry shaver substantially as described with reference to the accompanying drawings.

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