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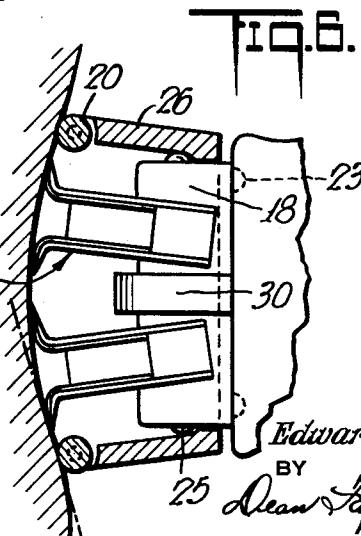
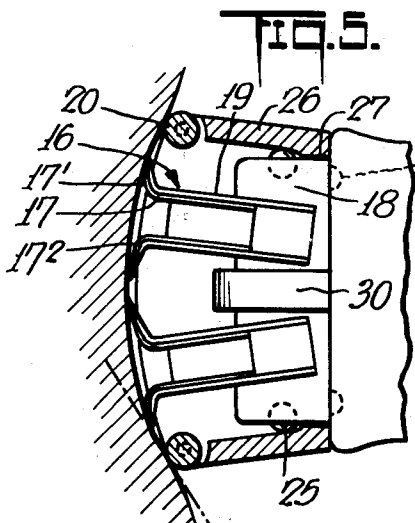
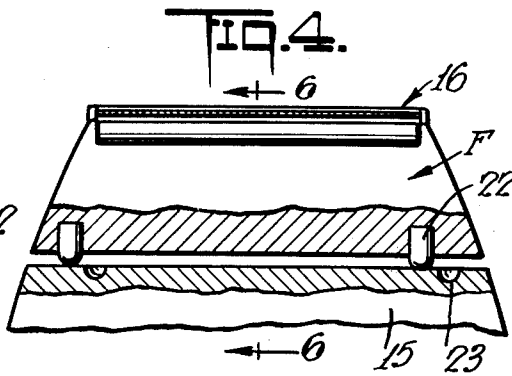
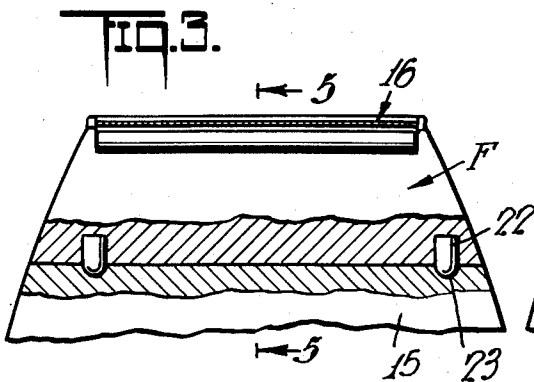
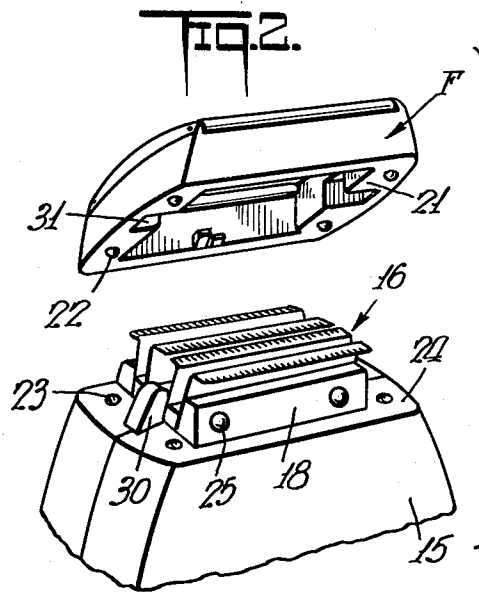
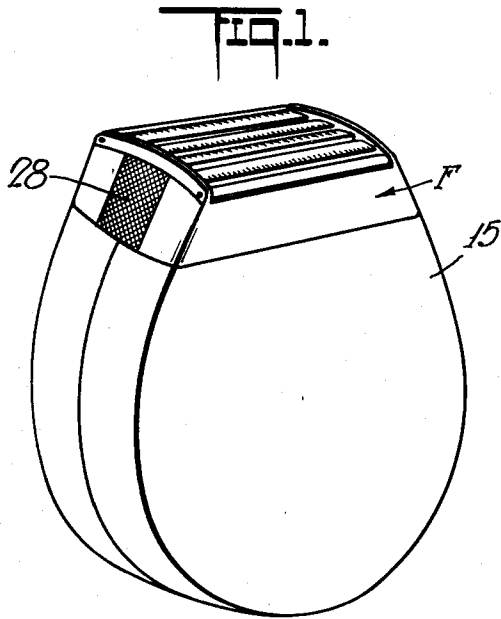
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ELECTRIC SHAVER

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2 Sheets-Sheet 1



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ELECTRIC SHAVER

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11 Claims. (Cl. 30—43)

The present invention relates to electric hair cutters and has an important application to electric shavers.

It is among the objects of the invention to provide an electric hair cutter of any suitable design, which has the added utility of permitting ready adjustment for either a "once-over" shave or a close shave, and in which the adjustment is effected without resort to any implement however elementary and without resort to even an adjustment screw or other mechanical setting implement, and can readily be effected by the non-expert user with un-failing accuracy and reliability.

It is a feature of the invention in a preferred mode of application, to provide the casing of the shaver with a generally rectangular guard frame, readily releasable from the casing by the user, which frame may be positioned upon the front of the casing to encompass the cutter construction and its holder, there being complementary positioning conformations on the frame and end structure of the casing which, when the frame is applied in one of its two possible positions, are in registry to permit the guard frame to be telescoped substantially into end contact with the structure of the casing that encompasses the cutting construction, for the latter to protrude substantially from the guard frame for a close shave, while with the frame applied in reverse position, that is, turned 180° from the first position, the complementary positioning conformations are out of registry, so that the frame is limited in its telescoping positioning over the cutter and its holder for a "once-over" shave.

According to another feature, the rectangular guard frame may have rollers at its sides for facility in movement along the skin during shaving and may have a roughened conformation at its ends to facilitate manual removal of the guard frame from the casing for access to the cutter and for changing the positioning of the guard from "once-over" to close shave, and conversely.

In the accompanying drawings in which are shown one or more of various possible embodiments of the several features of the invention,

Fig. 1 is a perspective view of a completely assembled shaver,

Fig. 2 is a fragmentary dropped perspective view of the shaver, showing the guard frame withdrawn from the end of the casing,

Fig. 3 is a fragmentary front elevation of the shaver with parts broken away to show the position of the frame relative to the casing in close shaving position,

Fig. 4 is a view similar to Fig. 3, showing the position of the parts with the guard frame reversed or turned 180° from the position of Fig. 3, for "once-over" shave position,

Fig. 5 is a transverse sectional view taken on line 5—5 of Fig. 3, showing the relation of the shaver to the face for close shave,

Fig. 6 is a transverse sectional view taken on line 6—6 of Fig. 4, and similar to Fig. 5, except that it shows the relation of the parts for "once-over" shave.

Fig. 7 is a front elevation of another embodiment of shaver with parts broken away, better to reveal the construction,

Fig. 8 is a fragmentary dropped perspective view of said embodiment showing the guard frame withdrawn from the casing,

Fig. 9 is a bottom plan view of the guard frame,

Fig. 10 is a fragmentary transverse sectional view taken on line 10—10 of Fig. 7,

Fig. 11 is a transverse sectional view taken on line 11—11 of Fig. 7, for close shave, and

Fig. 12 is a view similar to Fig. 11, showing the relation of the parts with the guard in reversed position or turned 180° with respect to the position shown in Fig. 11, for "once-over" shave.

Referring now to the embodiment of Figs. 1 to 6, there is shown a more or less conventional casing 15 for a shaver for housing any conventional type of electric motor, preferably an armature motor of type useful on either alternating or direct current. The motor is not shown since its construction is no part of the present invention. The motor is connected by a transmission linkage (not shown), within the casing, for reciprocation of the cutter blade conformation 16 which is illustratively shown in the form of two duplex cutters 17 which are removably mounted in a cutter holder 18 at the front end of the casing. While the blades could be of any suitable form, such as those of various familiar types of electric shavers, there is illustratively shown a preferred form of cutter in which the duplex cutter element 18 has turned out cutters 17' and 17" oppositely directed, for direct engagement with the skin and resting upon the comb structure 19 which protrudes laterally beyond the cutter and does not intervene between the cutter and the skin. A preferred form of cutter assembly is substantially that of U. S. Patent to Angst et al. No. 2,696,665, issued December 14, 1954. Since the particular structure of cutter is by itself no part of the present invention, it need not be further described.

According to the invention, the cutter conformation and its mount at the forward end of the casing are encompassed by a generally rectangular guard frame F which is readily removable from the casing by the user, to permit access for the purpose of cleaning, and for positioning in either of two alternative settings, that shown in Figs. 3 and 5 and Figs. 4 and 6, respectively, in which latter the guard frame is in reverse position or turned 180° from that of Figs. 3 and 5. The guard frame is preferably equipped with rollers 20 along its longitudinal outer edges to facilitate smooth travel over the skin in use.

Complementary positioning conformations are on the lower face 21 of the guard frame and the upper part of the casing respectively. These complementary conformations are illustratively pins 22 protruding from the guard frame face 21 and corresponding depressions 23 in the end face 24 of the casing that constitutes the rim about the cutter holder 18. There are preferably four pins, as shown, and four complementary depressions. The pins are arranged asymmetrically, the two pins 22 near the right end wall of the frame shown in Fig. 2, being closer to said wall than the two pins 22 near the opposite or left end wall of said frame. The same relation applies to the depressions 23 in the end rim 24 of the casing, those at the right in Fig. 2 being nearer the corresponding edge of the casing than those at the left.

The guard frame is preferably of outer dimensions to come flush or nearly flush with the corresponding face and end walls of the casing 15 so that when assembled as shown in Figs. 1 and 3, the guard frame appears to be unitary with or as an extension of the casing. In the position of Figs. 1, 3 and 5, the pins 22 on the frame register with and extend into the depressions 23 in the end of the casing, so that the cutters protrude to a maximum extent outward from the guard frame to permit a close shave, as appears most clearly from Fig. 5, in which

a relatively large angle is subtended between the skin and the span determined between the blade 17 and the associated roller 20, as best shown by dot and dash lines in Fig. 5.

Preferably an automatic latch keeps the frame securely in place during shaving. Such latch desirably may be in the form of spring-urged balls 25, on the side walls of the blade holder 18, one near each end and resiliently pressed against the corresponding inner face of the side walls 26 of the guard frame F, each side wall being thickened as at 27 near its free end to necessitate more than negligible removal thrust in order to depress the spring-urged balls 25 in withdrawal of the guard frame from the casing.

The end walls of the guard frame are preferably roughened as at 28 for effective finger and thumb thrust in grasping the guard frame F for withdrawal from the casing when occasion arises.

Reversing the guard frame end to end, that is at an angle of 180° and re-applying it upon the casing, the pins 22 by virtue of the asymmetrical relation will, as best shown in Fig. 4, be out of registry with the corresponding depressions 23, so that the frame, when pushed into place as far as it will go, is displaced from the end of the casing by a distance in the order of $\frac{1}{16}$ to $\frac{1}{8}$ inch. As best shown in Fig. 6, the gap thus determined between the end of the casing and the frame, positions the rollers more nearly flush with the cutting blade edges than in Fig. 5, to permit only a "once-over" shave as indicated by the dot and dash lines of Fig. 6.

The casing end has a pair of wedge shaped lugs 30 along its mid-section which coact with corresponding notches 31 in the inner wall of the guard frame to assist in readily positioning the same.

In the embodiment of Figs. 7 to 12, there is shown a preferred form of duplex cutter 35 that is embraced by the corresponding comb structure 36. Here also two sets of cutter and comb assemblies are shown, each removably lodged in a corresponding socket 37 in holder 38 protruding from the flat face 39 of the end wall of the casing 15'. The protruding blade holder structure 38 has lateral rails 39 with end extensions 40 at each side thereof, those at one side having a notch 41 in the top of their end extensions at the outer face thereof, and the end extensions at the other side having each a notch 42 in the top of the end extension at the inner face thereof, as best shown in Figs. 8, 11 and 12.

The rectangular guard frame F' is generally similar to that of the embodiment of Figs. 1 to 6, but instead of pins 22 of the first embodiment, there are lugs 43, preferably protruding downward along the inner face of each end wall as extensions from a thickened ledge 44 near the outermost edge of said end wall. These lugs at each end wall of the guard frame are, one set 43' near the adjacent side wall 45 of the guard frame and the other set 43² at a greater distance from the corresponding side wall 46.

The casing has a protruding latch 47 on the cutter holder rail 39 at each side, said latch being somewhat off center, that is to one side of the little lateral lug 10 at the center. The latch coacts with complementary latch elements 48 and 49 at the lower part of the side wall of the guard frame, spaced with respect to the inner edge of the guard frame, to determine respectively the close shave position shown in Fig. 11, or that for "once-over" shown in Fig. 12. The guard frame may have sufficient resiliency to permit the latching action without resort to springs. Lug 10 extends between latch elements 48 and 49 when the guard frame F' is in place in either of its two possible settings for accuracy of positioning.

Thus when the guard frame is positioned in the relation shown in Fig. 11, the lugs 43 register with the notches 41, 42 in the cutter holder so that the guard frame can be pushed all the way down for contact of its

edges with the end of the casing, as shown in Figs. 10 and 11, which is the position for close shave.

On the other hand, when the guard frame is reversed, that is, turned to 180° horizontally from the position shown in Fig. 8, the asymmetrically arranged lugs 43', 43² will be out of registry with the notches 42 and 41, so that they abut the unnotched end portions of the cutter holder rails 39, as shown in Fig. 12, and limit the telescoping application of the guard frame to permit only "once-over" shave.

The guard frame can be readily removed by simply grasping the end walls roughened at 28', between a finger and the thumb, pressing firmly, so that the sides of the resilient guard frame bow-out and thereby release the latch.

Other elements of the embodiment of Figs. 7 to 12 that are not specifically described are substantially identical with the corresponding parts of the embodiment of Figs. 1 to 6 and have the same reference numerals as those of the latter, but primed.

The guard frame has no mechanism whatsoever, not even an adjustment screw, and its positioning is determined readily and reliably without likelihood of jamming or other derangement.

It will thus be seen that there is shown a simple and convenient arrangement by which the user can position the guard frame in either of its two possible relations with respect to the casing to determine either a "once-over" or a close shave. The guard frame may readily be reversed during a shaving operation, should a sensitive or delicate area require the "once-over" rather than the close shave setting, and conversely.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope of the claims, it is intended that all matter contained in the above description, or shown in the accompanying drawings, shall be interpreted as illustrative and not in a limiting sense.

Having thus described my invention what I claim as new and desire to secure by Letters Patent of the United States is:

1. In an electric shaver, a casing and a cutter protruding from the end of the casing, said casing having positioning conformations asymmetrically arranged laterally of the protruding cutting structure, a removable guard to encompass the cutting means, having protruding asymmetrical positioning conformations complementary to those on the casing, and latch means releasably to retain the guard in one position relative to said cutter in position thereof in which said complementary positioning conformations coact for one degree of cut and in position in which the protruding conformations are spaced from the complementary conformation to determine another setting of the guard for a different closeness of cut.

2. In an electric shaver, a casing, a cutter conformation at one end thereof, a rectangular guard frame releasably mounted on the end of said frame, substantially to encompass the cutter structure with the cutter protruding therefrom in operative position, said rectangular frame being adapted to be releasably affixed by the user in either of two positions of the frame displaced at 180° relative to each other, the end of said casing and said frame having co-acting conformations comprising studs and depressions respectively, asymmetrically arranged with respect to the coating faces of the casing and the frame for bottoming of the frame relative to the casing end about the cutter structure in one of the two positions of the casing and frame, in which position the studs and depressions are in registry, and for unregistered relation thereof in the other of said positions for slight spacing of the guard frame from the casing to effect a lesser protrusion of the effective cutter from the frame for less close shave.

3. The combination recited in claim 2, in which the

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casing has latch means near the cutter end and the frame has a coacting conformation for effective latching of the frame in position by said latch means in each of the alternative positions of the frame.

4. An electric shaver comprising a casing, a cutter structure protruding from the forward end of the casing, said casing having an end surface encompassing said cutter structure, a rectangular guard structure adapted to be releasably affixed by the user in either of two positions at 180° from each other about said cutter structure, and complementary stop conformations asymmetrically arranged at the casing end portion and the adjoining frame end portion respectively, for coaction thereof in telescoping relation in one position of the frame for a relatively inward position thereof with respect to the cutter and for non-registry thereof in the opposite of the two possible positions of the frame for relative outward position of the frame for less close shave, and means releasably latching the guard frame in place in each of said possible positions thereof relative to the casing.

5. The combination recited in claim 4, in which the asymmetrical conformations on the frame are downwardly protruding pins at the end walls and at different distances from the adjacent side walls of the frame and in which the complementary conformations on the casing are depressions at the end portion of the casing structure, spaced at corresponding different distances from the sides of the casing end for registry in one of the two possible positions of the guard frame and for non-registry in the other possible position of said guard frame.

6. The combination recited in claim 5, in which the latch means comprises a spring ball latch element on each side near each end of the holder and in which each side wall of the guard frame has a protruding portion near its inner lower edge over which the respective ball elements snap in place in positioning the holder.

7. The combination recited in claim 4, in which the rectangular guard frame has a roughened gripping conformation at its outer end walls to facilitate removal of the guard frame from the casing by the user.

8. An electric shaver comprising a casing, a cutter holder at one end of said casing, said casing presenting a flat surface encompassing said holder, a cutter removably affixed in said holder, said holder having a rectangular outer wall with notches near its four corner, the notches near one side of the holder being closer to said side than the notches near the other side of the holder, a rectangular guard frame having parallel side walls and parallel end walls of dimensions to encompass said blade holder, said guard frame having small lugs protruding downward near its end walls, asymmetrically arranged for registry with the notches in the blade holder in one of the two alternative possible positions of the guard frame upon the casing and in non-registry in the

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other of said positions, whereby in one of said positions the guard may be telescoped with its inner wall substantially engaging the end surface of the casing and in the other position the lugs are out of registry with the notches and the guard is positioned with respect to the frame at a slight distance from the end of the casing, and latch means on the casing structure and coacting guard frame structure for releasably latching the frame in place in either of its two possible positions on the casing.

9. The combination recited in claim 8, in which the latches protrude from the sides of the blade holder at positions off the center of said sides and in which the frame has two latch lugs near the lower part of each of its inner side walls, one of said latch lugs being farther from the lower edge of the frame than the other for effective latching of the frame in place in either of its two alternative positions by coaction of the latch with the corresponding latch lug.

10. The combination recited in claim 8, in which the cutter holder has lateral conformations extending slightly beyond the ends of the intervening main holder structure and in which the notches are located in the upper surfaces of said four extension conformations, the notches at one side being at the outer portion of the extensions and the notches at the other side at the inner portion of said extensions, and in which each end wall of the guard frame has a thickening ledge at the upper portion of the inner surface thereof and the lugs extend downward from the lower edge of said thickening ledge, at one side from near the corner of the frame and at the other side at a distance from the corresponding corner.

11. An electric shaver comprising a casing, a rectangular holder for a cutter to protrude from one end surface of the casing, a rectangular guard frame of dimensions to encompass the holder and substantially all of the cutter, with the blade end of said cutter protruding therebeyond, whereby said frame is adapted to be positioned by the user upon the casing in either of two positions at 180° from each other, pins protruding from the under-face of said guard frame and asymmetrically positioned, one pair nearer the corresponding side thereof than the other pair, depressions in the end of the casing, asymmetrically positioned for accommodating said pins in one of the two possible positions of the frame and for non-registry thereof in the other of the two possible positions of the frame, and automatic latch means releasable to retain the guard frame in either of its two alternative positions.

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