

Oct. 13, 1959

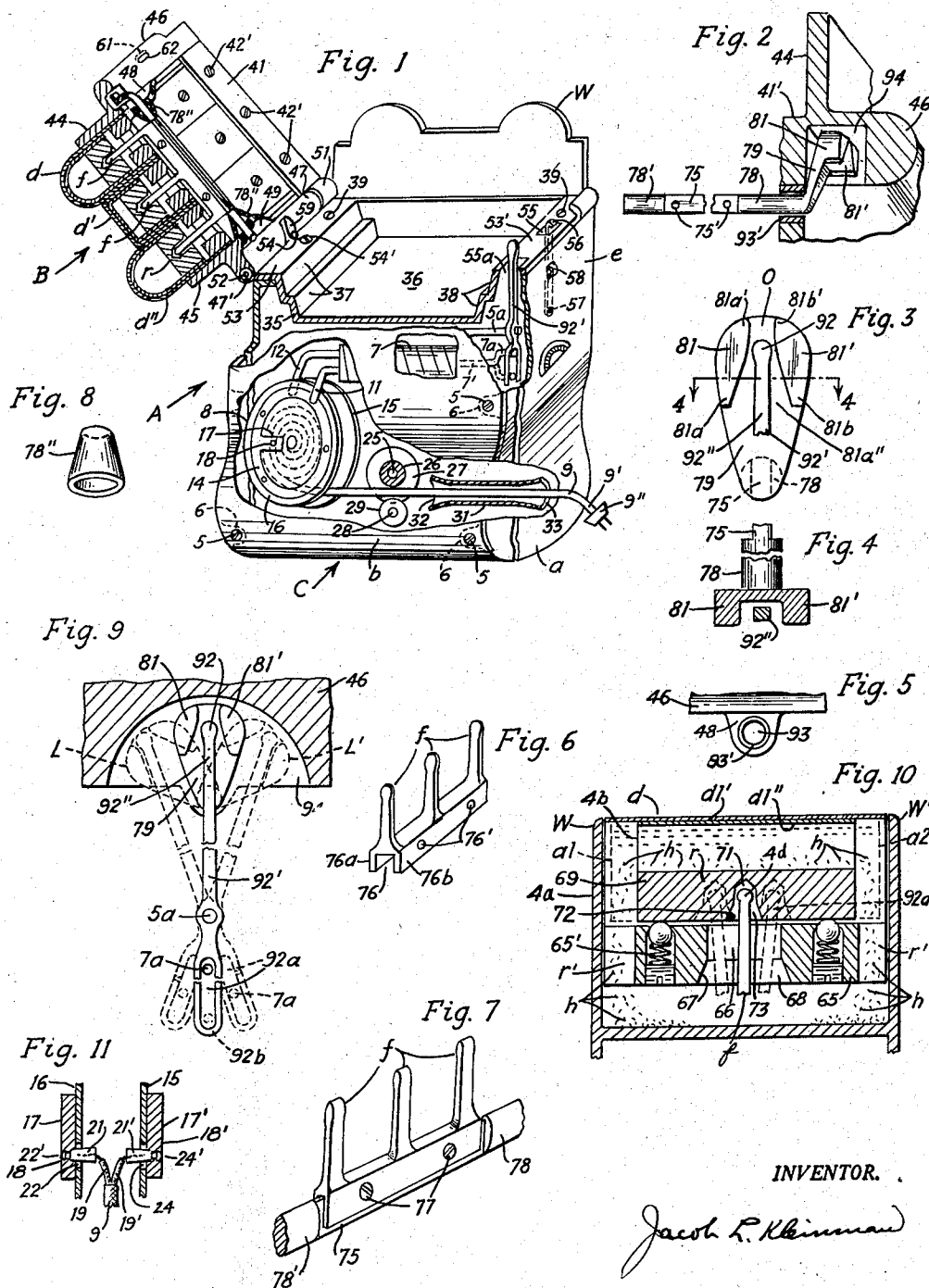
J. L. KLEINMAN

2,908,074

SHAVING IMPLEMENT HAVING AN ASSEMBLED HINGEABLE SHEARING SECTION

Filed March 2, 1955

2 Sheets-Sheet 1



Oct. 13, 1959

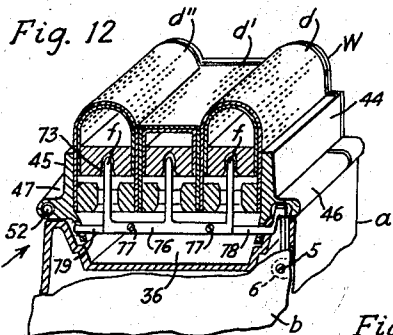
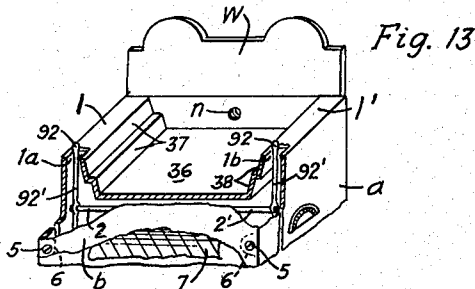
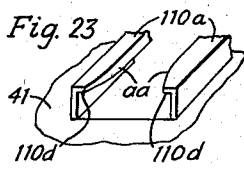
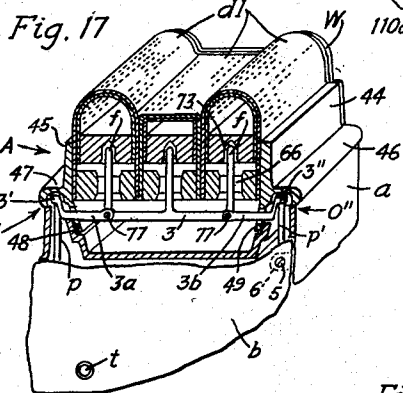
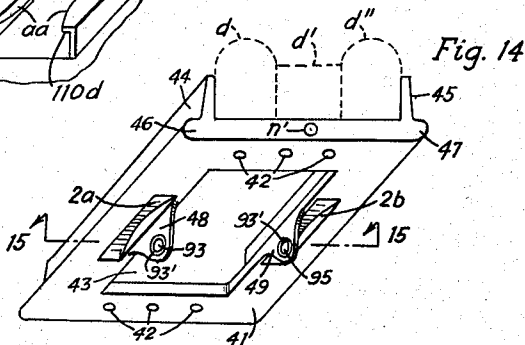
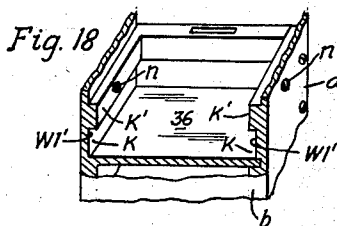
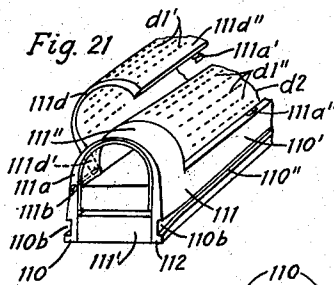
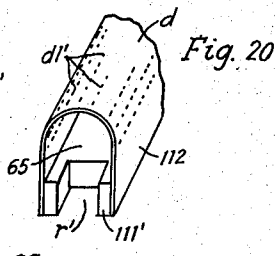
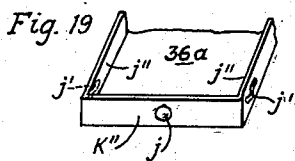
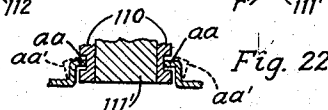
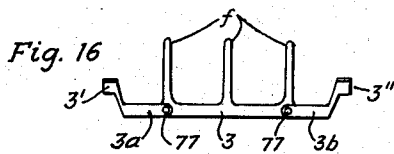
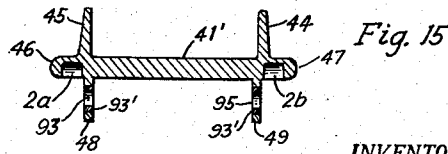
J. L. KLEINMAN

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SHAVING IMPLEMENT HAVING AN ASSEMBLED HINGEABLE SHEARING SECTION

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2 Sheets-Sheet 2



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2,908,074

SHAVING IMPLEMENT HAVING AN ASSEMBLED HINGEABLE SHEARING SECTION

Jacob L. Kleinman, Arverne, N.Y.

Application March 2, 1955, Serial No. 491,573

7 Claims. (Cl. 30—41)

This invention relates to the construction of shaving implements in general, and more particularly to a type known as electric razors or dry shavers; and is filed as a continuation in part of my copending applications S.N. 378,356, filed Sept. 3, 1953; and S.N. 338,089, filed Feb. 20, 1953; and S.N. 226,685, filed May 16, 1951. The said application S.N. 226,685 having been filed as a continuation in part of my then copending application S.N. 726,706, filed Feb. 5, 1947, matured into Patent No. 2,629,169, issued Feb. 24, 1953.

In accordance with my invention, I produce a shaving implement wherein the seat for holding the removable shearing section is provided with a non-perforated floor, and wherein there are no actuating elements extending from the motor through the seat floor for direct contact with the assembled individually removable shaving units to operate the movable shearing member therein, and wherein the individually assembled shaving units are held frictionally in desired position for shaving purposes, and wherein the movable means for moving the movable shearing members for shaving purposes is carried by the assembled removable shearing section, and wherein the shaving unit may be provided with a hingeable outer shearing plate and with means for holding such shearing plate in desired shaving position, and wherein the shaving unit is provided with spaced means for the sheared hair to pass therethrough to be stored upon the non-perforated seat-floor, and wherein the implement is provided with means for having a cable-cord removably connected thereto and housed therein.

There is, therefore, thus produced, in accordance with my invention, a shaving-implement wherein the motor compartment of the handle is provided with a non-punctured roof-portion and the motor housed within the said motor compartment has no actuating elements (which usually extend therefrom through openings within the roof portion of the motor compartment) for direct contact with the shaving unit to operate the movable shearing member, and wherein such non-punctured roof-portion also serves as a receptacle to house the hair sheared by the shearing elements, and wherein the movable means for operating the movable shearing member is carried by the removable assembled shearing section, and wherein the assembled removable shearing section comprises a carrier serving as a base portion for having assembled shaving units secured individually thereto in a tight-frictional manner, and wherein the individually assembled shaving units are each provided with a chamber having open end sections, and wall portions extending above the seat-floor for covering such open end sections when the latter are in normal shaving position to prevent the escape of sheared hair therefrom while shaving, and wherein such open end sections are provided with grooved end portions for the sheared hair to pass therethrough and be stored upon the non-perforated or non-punctured floor of the receptacle, and wherein the assembled shearing section may be completely removed, or hinged out, of normal position away from said wall

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portions to uncover the open end portions for the removal of sheared hair from the chambers of such shearing section and from the non-perforated wall of the said receptacle, and means for holding such shearing section in such non-shaving position, and wherein such shearing section is adapted to be replaced into normal shaving position, and wherein the implement is provided with means for having a cable-cord removably secured thereto and housed therein.

To illustrate the ordinary commercial utility of my shaving implement in daily life, a shaving implement constructed in accordance with my invention, of whatever shape, style or type it may be made, can be utilized to great advantage; for example, in the ordinary type of electric shavers the motor is provided with actuating elements extending directly therefrom, and the roof-portion of the motor compartment which forms the seat-floor for holding the removable shearing section is provided with openings to permit such actuating elements to pass therethrough for directly engaging the movable shearing member for operable purposes. Each of these openings are of a size larger than such thickness of the actuating element for the purpose of permitting free lateral movements of such element within its respective opening while moving the movable shearing member for shaving purposes. A great number of sheared hairs, which come through the shearing openings or slots, accumulate within the chamber of the reciprocatory member. These hairs usually make their way through the openings of the reciprocatory member and stationary member and then through the openings of the seat-floor (through which the actuating elements pass) directly into the motor compartment and clog up the motor; in which case the motor becomes defective and the parts thereof can not operate freely and properly. The user must then take his shaver to the "service station" and undergo the costly expense of servicing and cleaning his electric shaver. Furthermore, the movements of the clogged up joined sections increase motor noise and occasionally cause the motor parts to wear out quickly and lose their proper frictional fit, in which case the motor becomes deficient and useless, and the user must then undergo the expense of paying for a new motor. Such a matter naturally causes great annoyance and discomfort to the user, and is therefore a great hindrance to the expansion of the electric shaver industry.

Whereas in an electric shaver made in accordance with my invention, the above-mentioned objectionable features are completely eliminated. In my invention my motor has no actuating elements extending directly therefrom for engaging directly the movable shearing members; it will be seen that in my structure the seat-floor located underneath the shearing members is without any punctures or openings and therefore forms a non-perforated roof over the motor compartment completely covering such compartment, and simultaneously therewith such non-perforated roof also serves as a receptacle to have hair sheared by the shearing section stored thereon and prevent such sheared hair from entering into the motor compartment, the motor in my structure is therefore fully protected against possibilities of being clogged up by hair sheared while shaving. Thus the normal operation of my motor in my structure will not be hampered by sheared hair thereby prolonging its life, efficiency and smooth operation, rendering better service and greater shaving comfort and satisfaction to the user to an extent not accomplished heretofore by the ordinary type of electric shavers.

It is quite obvious that the simple and easy manner in which the assembled shearing section of my shaving implement can be removed, or hinged out of normal shav-

ing position into a non-shaving position, for the removal of sheared hair from the shaving units, or from the non-perforated floor; or for the removal or replacement of shaving units or parts thereof; or for the adjustment of such parts or units, and then be reverted back or replaced into normal shaving position for shaving purposes, affords the possibility for the user to clean or remove the shaved hair from the instrument with greater ease and convenience, and to remove or replace his assembled shaving units or parts thereof, or make other desirable adjustments, without resorting to professional aid of costly "service stations"; and therefore keep such instrument in a better condition for shaving purposes than is possible with the ordinary type of electric shavers. And also the fact that my motor is encased in a completely closed compartment will, to a great extent, lessen the sound of the motor noise. These desirable outstanding features are of great importance to the consumer, they will add greatly to the comfort of the user, and thus popularize the use of the instrument to a great degree; to an extent whereby such shaving implement may prove to be of great commercial value.

From the above it is evident that my present invention is an important contribution to the art of making electric shavers. It can be readily seen, that, an electric shaver, produced in accordance with my invention, fulfills a long felt need in the industry of electric shavers; it eliminates objectionable features of the present type of electric shavers.

Just a press upon the spring button on the handle will cause the assembled shearing section to spring into an open position and the user can easily remove, or clean out, the sheared hair from the shaving units or from the non-perforated floor of the receptacle. It is thus clear that my herein invention teaches a new and unique form of structure not known heretofore in the art of manufacturing electric razors. A structure wherein the actuating elements are carried by the shearing section and not by the motor and wherein the motor compartment is covered with a nonperforated roof and is therefore protected against the inflow of sheared hair into the vicinity of the motor, so that such motor is thus maintained within its closed motor compartment in a clean condition, thereby prolonging the life, efficiency and service of such motor. It is therefore clear that an electric shaver, made in accordance with my invention can be utilized to great advantage, it will last longer and will operate more efficiently than the ordinary type of electric shaver, it will be more economical and will render better service to the user.

The variety of possible application of my novel construction in connection with different types of shaving implements, as hereinabove indicated, is so prolific that for the purpose of illustrating the invention the specific embodiment of my invention in its application to a shaving-implement exhibiting the greatest difficulties has been selected. Such shaving-implement is one which necessarily conform most rigidly to the contours of the portion to be shaved and one which has the field of greatest possible commercial use. For this purpose I have selected for illustration of my novel construction, a shaving-implement constituting a multiple-head electric shaver, so that the principles of construction may be best illustrated in a shaving-implement known as a multiple-head electric shaver.

For a fuller understanding of the nature and objects of the invention, reference is had to the following detailed description in connection with the accompanying drawings, in which:

Fig. 1 is a perspective view of my shaving implement with the assembled shearing section in an hinged-open non-shaving position, partly broken away, showing part of the inner structure of the shaving implement;

Fig. 2 is an enlarged fragmental perspective cross-

sectional view of the front-rib, showing the position of the vibrator and of the shaft for holding the stem structure;

Fig. 3 is an enlarged front view of the vibrator showing the position of the movable post between the two pillars;

Fig. 4 is a cross-sectional view taken along the line 4-4 of Fig. 3.

Fig. 5 is a fragmental view of the rib showing one of the earloops for holding the shaft of the stem structure;

Fig. 6 is a perspective view showing the stem structure;

Fig. 7 is a perspective view, partly broken away, showing the assembled stem structure;

Fig. 8 is a perspective view showing the cone-shaped washer;

Fig. 9 is an enlarged fragmental view showing the operable or swingable movements of the movable post and the vibrator;

Fig. 10 is an enlarged cross-sectional view showing the operable movements of the stem for oscillating the movable shearing member;

Fig. 11 is a fragmental cross-sectional view showing the connection between the cable-cord and the rotatable spool;

Fig. 12 is a perspective cross-sectional view showing the assembled shearing section positioned upon the handle structure in normal shaving position;

Fig. 13 is a modified perspective cross-sectional view of the handle structure, partly broken away;

Fig. 14 is a modified perspective view of the carrier;

Fig. 15 is a cross-sectional view taken along the line 15-15 of Fig. 14;

Fig. 16 is a modified view of the assembled stem structure;

Fig. 17 is a perspective cross-sectional view showing the assembled shearing section positioned upon the modified handle structure in normal shaving position;

Fig. 18 is a perspective cross-sectional view, partly broken away, showing part of the handle structure;

Fig. 19 is a fragmental perspective view of a drawer for the handle structure;

Fig. 20 is a fragmental perspective view of the stationary shearing member showing the grooved end portions of the floor sections for the sheared hair to pass therethrough to be stored upon the non-perforated floor of the receptacle;

Fig. 21 is a fragmental perspective view showing the stationary shaving member being provided with a removably mounted hingeable perforated shearing plant and with outer side grooves;

Fig. 22 is a fragmental view showing the slidable manner in which the shaving unit may be secured to the base portion of the assembled shearing section;

Fig. 23 is a fragmental perspective view showing the structure of the springable flange portions for frictionally engaging the individual shaving units; and

Fig. 24 is a view of the screw-element for holding the assembled non-hingeable shearing section in shaving position upon the handle structure.

For a better and clearer understanding of my invention, I am showing several of the cross-sectional views along a line which is located centrally of the shearing section.

Referring more particularly to the drawing, in which similar reference characters identify similar parts in the several views, in my novel shaving implement.

Arrow A indicates my shaving implement, comprising an assembled shearing section indicated by arrow B, and arrow C indicates a hollow casing serving as a handle structure.

The handle comprises two separable sections *a* and *b* secured to each other by screw-elements 5; these elements 5 are positioned through openings formed in the section or cover *b* and then placed in a rotatable manner into screw-threaded openings formed in the wings or extensions of the section *a*, as indicated by the dotted

lines 6. A motor 7 is housed within the handle for op-

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erating the shearing section; and a rotatable spool 8, for holding the cable-cord 9, is housed within the handle (either in the same compartment or in a separate compartment) and is connected to the motor 7 by means of ribs 11 and 12. Each of these ribs 11 and 12 engages frictionally, in a springlike manner, one of the rings 14 which are individually secured to each of the discs 15 and 16 of the spool 8. These rings 14 are each provided with extensions or flange portions 17 having openings 18. The cable-cord 9 consists of two sections 19 and 19' (Fig. 11). The front portion 9' of the cable-cord 9 is secured to a plug 9'' and the rear end portions of the sections 19 and 19' are each provided with hook members 21 and 21'. The hook 21 is positioned through the opening 22 formed in the disc 16 and secured tightly within the opening 18 of the flange or extension 17, as indicated by numeral 22', and the hook 21' is positioned through the opening 24 formed in the disc 15 and secured tightly within the opening 18 of the flange 17', as indicated by numeral 24'; so that when the plug 9'' of the cable-cord 9 is connected to an electrical outlet the electric power will flow through the cable-cord sections 19 and 19' into the flange portions 17 and 17' and rings 14 and then through the ribs 11 and 12 into the motor 7 for operating the shearing section of the implement.

Rotatably mounted upon the extension or pin 25, within the handle structure, is a two disk wheel having a shoulder 26 and two facing side disks 27, and rotatably mounted upon the extension or pin 28 is a plain wheel having a shoulder 29. This plain wheel is positioned between the two disks 27, in a manner having its shoulder 29 spaced away from the shoulder 26, to an extent providing a spaced section for the cable-cord 9 to be positioned loosely therein. The handle structure is also provided with a tubular-shaped section 31 wherein the cable-cord 9 may be positioned and be moved loosely there-through; this tubular section 31 is provided with an enlarged inner-end portion 32 and with an enlarged outer-end portion 33 to prevent frictional injuries to the cable-cord 9 when being moved within such tubular section.

A box-shaped element or partition 35, having a non perforated plate or floor 36 and stepped side walls 37 and 38, is positioned upon the upper open end portion of the handle structure and secured thereto by suitable means, for example, screw elements 39; thereby closing such open end portion of the handle structure.

The assembled shearing section indicated by arrow B, comprises a carrier 41, having a plurality of openings 42 and an enlarged spaced opening 43 (Fig. 14), and a pair of upstanding side walls 44 and 45 having a pair of rib sections 46 and 47, and a pair of downwardly extending ear-loops 48 and 49.

A plurality of assembled individually removable shaving units d , d' and d'' , each comprising an outer stationary shearing member and an inner movable or reciprocatory shearing member, are individually secured to the carrier 41 by suitable means, for example, screw elements 42'; thereby combining such units and carrier into an assembled unitary shearing section. This assembled shearing section may be secured to the handle structure in any suitable manner; for example the rib portion 47 may be provided with an opening 47', and the extensions 51 may each be provided with openings situated in alignment with the opening 47', and a pin or screw-element 52 may be positioned therethrough in a manner providing means whereby the assembled shearing section may be hinged, from and to the handle structure. The upper flange portion 53 of the handle structure (Fig. 1) is provided with a suitable spring 54 secured thereto by a screw element 54', and the flange portion 53' on the opposite side (same Fig. 1) is provided with an opening 55 through which extends or projects a spring-hook member 56; this member 56 is secured to the handle by any suitable means, for example, a screw element 57, and is provided with a bulged or button portion 58 protruding through an open-

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ing in the wall e of the handle structure; so that when the assembled shearing section is placed upon the handle structure in position for shaving purposes, the spring 54 will be situated within the opening 59 and the hook 56 will engage the lip 61 of the opening 62 and hold the shearing section in desired position upon the handle structure, for example, as shown in Fig. 12. And when desired, the user may press against the button 58 and thus move the hook 56 away from the lip 61 thereby enabling the tension of the spring 54 to force the assembled shearing section into a hinged-open position, for example, as shown in Fig. 1. Naturally, moving the assembled shearing section back into shaving position upon the handle structure will cause the spring-hook 56 to snap into position within the opening 62 and engage the lip 61 and thus hold the shearing section in closed position for shaving purposes.

The individually assembled shaving units of my structure consist of a stationary shearing member 4a and of a movable or reciprocatory shearing member 4b (Fig. 10). The floor portion 65 of the stationary shearing member 4a is provided with a through opening 66 of a size enabling one of the stem portions f to move freely therein. Such opening 66 may be provided with wall portions having beveled or outwardly flanged or inclined sections 67 shaped in a sloping or slanting manner providing therebetween an enlarged spaced area or section 68 for leading such stem portion f into desired position within the shaving unit.

The floor or under portion 69 of the movable shearing member 4b is provided with a section having an opening or slotted portion 71. Such slotted portion 71 may be provided with a roof portion r (Figs. 1 and 10) and with facing wall portions each having a beveled or sidewardly inclined section 72 shaped in a sloping or slanting manner providing an enlarged spaced area or section 73 therebetween for leading the upper portion 4d of one of the stem portions f into position within the opening or slotted section 71 under the roof portion r for moving the reciprocatory shearing member 4b within the stationary shearing member 4a for shaving purposes. Thus, it will be seen, when the assembled shaving unit will be placed into position upon its seat, the upper portion 4d of the stem f will be led, by the inclined wall portions, into the slot or opening 71 adjacent to the roof portion r for moving the reciprocatory shearing member for shaving purposes.

One of the most important features, or parts, of the present invention is the construction of my stem structure particularly so of the shaft 3 (for holding the stem section) and its mode, or manner, of operation.

The above-referred shaft comprises a flat-shaped portion 85, adapted to fit within the grooved portion 76 of the stem section and be secured thereto by screw elements 77 (see Figs. 2, 6 and 7). Such flat-shaped shaft 75 is provided with a rounded front portion 78 and a rounded rear portion 78'. It is naturally understood that either the openings 75' of the flat portion 75, or the openings 76' of either of the wall portions 76a or 76b, may be provided with screw-threads to receive the screw elements 77 for securing firmly the stem section of the flat portion 75. The front portion 78 of the flat shaft portion 75 is provided with an off-set portion adapted to form a vibrator 79 having a flat surface provided with a pair of pillars 81 and 81'. These pillars 81 and 81' are spaced apart from each other to an extent permitting the head portion 92 of the movable post 92' to be positioned therebetween for operable purposes (see Figs. 3, 9 and 12), and are shaped in such a manner as to permit the shank 92'' to move freely between the lower portions of such pillars 81 and 81' to enable the head portion 92 to operate and move or oscillate the vibrator 79 to and fro while the post 92' is being moved or swung upon the pin or pivot 5a in a manner for example as indicated by the dotted lines L and L' (see Fig. 9).

The ear-loops 48 and 49, extending downwardly from the carrier (Fig. 15) are each provided with an opening 93 having a washer 93' secured tightly therein by friction fit or other suitable means; and the front rib 46 of the carrier 41 is provided with an enlarged opening grooved or hollowed-out or recessed section 94, for a purpose which will be hereinafter explained.

To place the stem structure into desired position within the carrier the following method should be utilized. The flat shaft portion 75 should first be positioned into its place by having its rear portion 78' pushed through the opening 93 of the front ear-loop 48 and then be placed within the opening of the ear-loop 49, bringing the rounded portion 78 into the opening 93 of the ear-loop 48; the vibrator 79 is then moved or placed into the grooved section or opening 94, and the stem section is then positioned with its groove 76 upon the flat portion 75 and secured thereto by means of rivets or screw elements 77 passing through the openings 76' and 75' thereby holding the stem structure firmly assembled, as shown in Fig. 7. Naturally, the stem portions *f* being positioned parallel with the vibrator 79 protrude or project upwardly through the opening 43 and extend above the floor 41' of the carrier 41 (Fig. 15), thereby being in a position to enter the openings 66 and 73 of the assembled shaving unit when the latter is being secured to the carrier.

The pin, shaft or pivot 5a, located within the handle structure (Figs. 1 and 9) may be shaped in any suitable manner, for example circular-shaped cross-sectionally, adapted to hold the post 92' in a manner permitting the swingable or pivotal movements of such post 92' upon the pin 5a. The motor 7 is provided with a rotatable shaft 7' having an off-set or eccentric portion or pin 7a adapted to be positioned within the slot or opening 92a; so that when the motor 7 is provided with power for causing the rotatable shaft 7' to rotate, the pin 7a will then move the lower portion 92b of the post 92' to and fro, causing such post 92' to swing or pivot upon the shaft 5a and thus move the head portion 92 (which projects through the opening 55a and is located between the two pillars 81 and 81') into opposite directions, thereby moving or oscillating the vibrator 79 back and forth; during such movements of the vibrator 79, the shaft portions 78 and 78' will rotate within the openings 93 of the ear-loops 48 and 49, and the flat portion 75 will move the stem portions *f* into opposite directions to move the movable or reciprocable shearing member within the stationary member back and forth in a manner for example as shown by the dotted lines 92d (see Fig. 10).

The reciprocatory member of the shaving unit *d* is shorter in length than that of the stationary member, so that such reciprocatory member operates completely within the stationary member and is movable therein within the space indicated by the dotted lines a1 and a2, thereby enabling the wall portions *w* and *w'* to close completely the open end sections of the chamber of the stationary member to prevent the escape of sheared hair therefrom while shaving (Fig. 10).

For explanatory purposes I wish to point out the following: In the ordinary type of electric razor the reciprocatory member is usually provided with a through-opening for receiving the reciprocable actuating element, which extends from the motor compartment (through an opening in the roof of such compartment) directly into the chamber of the reciprocatory member; it is through these openings that the sheared hair make their way into the motor compartment and spread about the motor.

The non-punctured floor of my receptacle performs, simultaneously, two functions; namely, serving as a cover for covering completely the motor compartment and simultaneously therewith serving as a non-perforated or non-punctured receptacle for storing sheared hair thereon while shaving. This feature can be utilized, advantageously, with various types of structure;

and I desire it to be understood that the herein disclosures of this particular feature, and/or of the other features of the herein invention, are for illustrative purposes only and not for limitation purposes.

For example: In Fig. 1, I have shown an illustrated structure wherein the assembled shearing section, indicated by arrow B, is hingeably secured to the handle structure. It is naturally understood that, if desired, such assembled shearing section does not necessarily have to be so secured to the handle structure; such assembled shearing section may be secured to the handle structure in any other suitable manner; for example, in a manner as shown in Figs. 13, 15 and 17, wherein the flanges or wall portions 1 and 1' of the handle are each provided with openings 1a and 1b, and the handle structure is provided with two pins or shaft portions 2 and 2' each adapted to support thereon in a pivotal manner one of the post 92', and the rib portions 46 and 47 of the carrier 41 are each provided with an enlarged grooved or hollowed-out section 2a and 2b (see Figs. 14 and 15). The stem structure for this modified structure is provided with a shaft 3 having two vibratory sections 3' and 3'' (see Fig. 16). Each of these vibratory sections 3' and 3'' are provided with a rounded shaft portion 3a and 3b. This structure may be assembled in the following manner: The shaft 3a may be placed into the opening 93 of the ear-loop 48 and the shaft 3b may be positioned within the opening 95 of the ear-loop 49; the vibrator head 3' is then placed within the grooved section 2a and the vibrator head 3'' is then placed within the grooved section 2b, the stem section 3 is then placed into position and secured to the shafts 3a and 3b by suitable means, for example, rivets or screw elements 77. The stem portions *f* (being positioned parallel with the vibratory sections 3' and 3'') will project upwardly through the opening 43 and extend above the floor 41' of the carrier 41, thereby being in a position to enter the openings 66 and 73 of the assembled shaving unit when the latter is being secured to the carrier.

In this particular form of structure the assembled shearing section, as indicated by arrow A, is not secured to the handle in a hingeable manner, but is completely removable from the handle as an assembled unit and replaceable thereon, and secured thereto in a manner as will be hereinafter explained.

It is indeed a very simple operation to place the assembled shearing section upon the handle structure for shaving purposes. The invention herein is so simple in construction that the average user of an electric razor, or any layman (not skilled in the mechanical art) can easily remove the assembled shearing section from the handle or secure same on to the handle for shaving purposes. For example, the pillars 81 and 81' are shaped or formed in a manner whereby their lower end portions 81a and 81b are spaced further apart from each other than are their upper end portions 81a' and 81b'; (Fig. 3) thus providing an enlarged area 81a''; this enlarged area 81a'' serves as a guide or leader for leading the head-portion 92 of the post 92' (which projects through the openings 1a and 1b into desired position between the pillars 81 and 81' (Figs. 3, 9 and 10), so that when the assembled shearing section is being placed upon the handle structure, the head portions 92 of the movable or pivotal posts *p* and *p'* will first engage the enlarged spaced area 81a'' and then move into their proper positions within the spaced sections O between the two pillars 81 and 81', as shown at arrows O' and O'' (Figs. 3 and 17). The wall portions W and W' are each provided, at suitable locations, with screw-threaded openings *n*, and the carrier 41 is provided at suitable locations with openings *n'* (Figs. 13 and 14), so that by placing the screw elements S, in a rotatable manner, through the screw-threaded openings *n* and then into the openings *n'* (Fig. 14) the assembled shearing sec-

tion will be held securably upon the handle structure for shaving purposes (Fig. 17). Naturally, by removing or retracting the screw element S the assembled shearing section can be easily removed from the handle structure. Thus, by rotating the screw heads S' into a certain direction the removable shearing section will be held firmly in its position upon the handle structure; and by rotating the screw heads S' into the opposite direction will cause such assembled shearing section to be in a position whereby it can be easily and freely removed from the handle structure without any difficulty.

If desired, the handle structure may be provided with an opening, or spaced section, adapted to receive and house therein a removable drawer for removing the sheared hair from the instrument, such drawer may be located either in the handle structure or in the assembled shearing section. For illustrative purposes I am showing such drawer being located in the handle structure.

The handle section is provided, above its non-perforated floor 36, with a spaced section or opening *k* (Fig. 18) having undercut flange portions *k'*. A drawer *k''*, having a knob *j* and spring elements *j'* secured to the front portions of the side walls *j''*, is provided with a non-perforated floor 36a. This drawer *k''* is adapted to be positioned within the spaced section *k* and be held therein by the flange portions *k'* and also by the spring tension of the spring element *j'* pressing against the inner side faces W1' of the spaced section *k*. This form of structure facilitates greatly the removal of sheared hair from the shaving instrument. Particularly so, if the assembled shearing section is made to be completely removable. It is naturally understood that pulling out the drawer *k''* by the knob *j*, or other suitable gripping means, from the spaced section *k* for the removal of hair, accumulated therein while shaving provides the easiest and simplest method for the removal of sheared hair from the shaving implement; a function which the average user of an electric razor can perform very easily and without any difficulty.

The average thickness of the perforated material forming the shearing face or shearing section of the stationary shearing member is about several thousands of an inch, in some shaving instruments as little, or as thin, as two and one-half (2½) thousands of an inch. It is for this reason that shearing teeth of the stationary member break quite frequently, causing the user (whether skilled in the art of mechanics or not) to undergo the expense of obtaining a new shaving unit; which usually cost several dollars.

It can therefore be readily seen that my shaving unit, wherein the stationary shearing member is provided with a removably mounted shearing plate or section, is a great and important contribution to the art of making electric shavers. The user may, if desired, buy only the removable shearing portion, or shearing plate, and easily secure same in desired position.

This portion of my invention consists of a shaving unit comprising a stationary member and an inner movable member. The stationary member consists of an arch-shaped shell 111 (Fig. 21) having its two wall portions secured to the block 111'. The curved center portion (which usually forms the shearing face) having been removed in a manner leaving only two (front and rear) curved blank portions 111'. The wall portion 111a of the two front and rear curved blank portions 111' are each provided with aligned screw-threaded openings for receiving screw elements 111b therein. The removable shearing plate consists of an arch-shaped perforated element or plate 111d having openings formed in its side wall portions 111d', so that when the screw elements 111b are placed within the screw-threaded openings and rotated therein in a certain direction, their end portions will be moved into the openings of the wall portions 111d', of the removable

shearing plate, 111d, and will act as pivots for such removable shearing plate to hinge or pivot thereon. The front portion 111d'', of the removable or hingeable shearing plate 111d, is provided with a spring element 111a' shaped in a manner adapted to fit or snap into the opening or spaced section 111a'', located at the upper face of the wall section 110, to hold such hingeable shearing plate 111d in locked position for shaving purposes. This form of structure will enable the user to remove, or replace, a used or broken shearing plate whenever desired (such shearing plate would naturally cost much less than that of a complete shaving unit); and, in addition thereto, such structure will also permit the cleaning or removal of sheared hair from each shearing face individually. The user can easily hinge open the shearing plate 111d and remove the sheared hair from the inner and outer face-ports of the shearing teeth *d1'* of such shearing plate, and then remove the sheared hair from the shearing teeth *d1''* of the movable or reciprocatory member *d2*. This portion of the herein invention may therefore prove to be quite valuable to the industry in general.

If desired, the outer side wall portions 110 and 110' of the stationary shearing member may each be provided with a grooved section 110'', and the carrier 41 may be provided with a pair of facing upstanding springable flange portions 110a (Fig. 23) adapted to be positioned within the groove sections 110'' (Fig. 22). The grooved sections are each provided with enlarged front portions 110b forming leaders to lead the entrance of the flange portions 110a into the grooved sections 110''. The flange portions 110a are each provided with thinner and narrower front portion 110d, thus providing a wider space or area between such front portions to facilitate the entrance of the flange portions into the grooved sections 110''. This form of structure aids greatly in placing the individual shaving unit in position for being slidably secured to the carrier; for example, while beginning the slidable movement of the unit, the thinner and narrower front portions 110d of the flanges 110a will first engage the enlarged front portions 110b of the grooved sections 110'', and be slidably moved therein until having the wider flange portions *aa* engaging tightly the center portions of the grooved sections 110'' thus holding such unit secured firmly in its position upon the carrier 41. During such slidable movement such wider flange portions *aa* may be forced to spring backward, as indicated by the dotted lines *aa'*, Fig. 22, and thus facilitate such slidable movement and hold the shaving unit firmly in its position upon the carrier 41. Naturally, the carrier may be provided with several sets of openings or flange portions to support several individual shaving units thereon.

This form of structure is an important feature of the present invention; it will greatly facilitate the removal of old or used-out shaving units and the installation of new shaving units. This type of shaving unit does not have to be provided with screw-threaded openings, thus reducing the manufacturing cost of such unit; nor are screw elements necessary for attaching the individual shaving unit to the carrier 41, thereby again reducing the cost of the instrument.

It is naturally understood, that in addition of the shaving units being held in position by the flange portions 110a such units are also being sustained in their respective positions by the wall portions W and W' (which act as closure means for the open end chamber portions of the shaving units) when in shaving position.

The floor portion 65 of the stationary shearing member is provided with suitable tensioning means for example such as spring element 65' (Fig. 10) for urging the inner moveable shearing member upwardly to have its shearing teeth *d1''* engage the shearing teeth *d1'* of such stationary shearing member for shaving purposes.

I desire it to be understood, that the disclosures herein

are for illustrative purposes only and not for limitation purposes. And that the herein invention, or the teachings of same, or parts thereof, may be utilized in any desirable manner, or various changes in form of structure may be restored to without departing from the spirit of this invention. For example, in the illustrations I have shown my shaving unit consisting of a stationary shearing member having an inner movable shearing member located therein; it being understood that if desired various other suitable types of shaving units may be utilized in connection with my structure. Or, the hingeable shearing plate, instead of being secured to the shaving unit, may be secured or connected to other parts or portions of the instrument; or the ear-loop openings may be utilized without the washers 93'; or the stem structure may be provided at each of their end portions with cone-shaped washers or covers 78'', which may be made of any suitable material for keeping sheared hair away from the ear-loop openings; or for example, the step-like side walls 37 and 38 (which have been especially so formed for the purpose of positioning the ear-loop portions 48 and 49 adjacent thereto to conceal the openings through which the head portions 92 project) may, if so desired, be shaped or formed into any other suitable style for the accomplishment of the herein-above purposes; or, the push button *t* for causing the spring structure to rotate the spool 8 (spring structure not shown) winding the cable-cord 9 thereon for housing same within the handle structure, may be formed into various suitable or desirable styles or shapes, for example, roundhead, flat or plate-like shape; or various other changes in form of structure or assemblage may be resorted to. As above stated, the illustrations herein are for illustrative purposes only and not for limitation purposes.

From the above it is evident that my present invention teaches an entirely new form of structure in the art of making electrically operated shaving implements. The novel form, or manner, in which my shaving implement is constructed; the novel feature of having my assembled shearing section carrying the stem structure for operating the reciprocatory shearing member, whether it be a single assembled unit or a plurality of assembled units, whether secured to a carrier or secured to each other; and the novel structure of the vibrator and its pillars for operable connection with the movable post to move the stem structure for moving the reciprocatory members; and the novel combination of having the assembled shearing section carrying the individually removable shaving units and also carrying the stem structure including the vibratory portions and be completely removable as an assembled unit; and the novel feature of having a non-perforated cover serving as a roof over the motor compartment and simultaneously therewith also serving as a non-perforated receptacle for the sheared hair passing through the grooved end portions of the floor of the stationary shearing member to be stored upon the non-perforated floor of such receptacle; and the novel feature of having a drawer structure within the instrument for the removal of sheared hair without the removal of any of the shearing elements; and the novel feature of having the cable-cord stored within the handle structure and having means therein for the protection of such cable-cord during its movements into and out of such handle; and the novel feature of the stationary shearing plate being secured to the handle structure in a hingeable manner; the new combination of parts and sections combined in a new and heretofore unknown manner, provides a shaving instrument constructed on an entirely new principle. The manner in which provision is made (by means of my non-perforated cover) for the protection of the motor, establishes an entirely new and modern principle in the construction of electric shavers. It creates an electrically operated shearing device of a new and unique design, provided with practical and outstanding features, performing new functions unknown hereto-

fore, capable of performing its shaving operations to the utmost satisfaction of the user and to the fullest extent of its structural shearing ability; rendering a complete, clean and precise shave in a comfortable and pleasing manner to the user. It will therefore be seen that my invention, herein illustrated and described, provides a practical and useful shaving-implement, of a novel structure and patentable nature, solving the most vexing problems in the electric razor industry. It can be utilized to great advantage by the user and is therefore believed to be of great commercial value.

It will therefore be seen, that I have invented and perfected a shaving-implement provided with a hingeable or completely removable assembled shearing section of a new and unique design and structure, a shaving-implement which is practical, useful and therefore of commercial value, and although I have shown certain preferred forms or illustrations in order to explain and describe the novelty of my invention; yet, by showing such structures, I do not, by any means, limit myself to these structures, nor to the terms used in describing same, as they are for illustrative purposes only. Various suggestions and changes of structure may be resorted to, and I desire it to be understood that I have same in mind when showing and describing this invention, and seek protection by Letters Patent. And although I have mentioned in describing this invention of what material certain parts may be made, how they may be formed, shaped, or styled and how they may be assembled, yet I desire it to be understood that this structure, or parts thereof, may be made of any suitable material, and shaped, formed, styled or arranged in any desirable manner, and assembled in any suitable or convenient way so that the parts may be easily taken apart, removed, cleaned, replaced and/or reassembled, and that various changes in detail may be resorted to without departing from the spirit of this invention.

I claim:

1. A shaving implement consisting of a hollow casing serving as a handle and an assembled shearing section, said assembled shearing section comprising a carrier and shearing means and a stem structure having a vibrator and stem elements, said carrier carrying said shearing means and also carrying said stem structure, said carrier having a recessed section, said vibrator located within said recessed section, and the said stem elements engaging the said shearing means, means securing the said assembled shearing section pivotally to said handle, spring-hook, said spring-hook adapted to engage a portion of said assembled shearing section for holding such shearing section secured to the said handle in position for shaving purposes, a motor said hollow handle housing said motor, a non-perforated plate, said plate located between the said motor and the said shearing section covering the said motor and simultaneously therewith providing a non-perforated receptacle for holding thereon hair sheared by the said shearing means, said perforated plate having a wall portion extending upwardly above said plate, said wall portion having an opening, a connecting element, said element located within the said opening to provide a connection between said motor and the said vibrator to cause said shearing means to operate for shaving purposes, said spring-hook adapted to be disengaged from the said assembled shearing section permitting such assembled shearing section to be hinged away from the said non-perforated receptacle, means for sustaining said assembled shearing section in said hinged away position, said assembled shearing section adapted to be hinged back into normal shaving position and be held in such position by the said spring hook snapping into connection with the said assembled shearing section, a portion of said assembled shearing section covering the said opening of said wall portion while being in shaving position upon the said handle, and means for operating the said

motor to cause the operation of said shearing means for shaving purposes.

2. A shaving implement consisting of a hollow casing serving as a handle and an assembled shearing section, said assembled shearing section comprising a carrier and shearing means and a stem structure, having a vibrator and at least one stem carrying element, said carrier carrying said shearing means and the said stem structure, said shearing means comprising a stationary shearing member and a reciprocatory shearing member each having floor portions, the floor portion of the said stationary shearing member having an enlarged centrally located opening and the floor portion of the said reciprocatory shearing member having a centrally located grooved opening, said stem element positioned through the said enlarged opening having its upper end portion located within said grooved opening, hingeable means securing the said assembled shearing section to said handle, a spring-hook-and-lip connection between the said assembled shearing section and the said handle for holding such assembled shearing section in shaving position upon the said handle, a motor, said hollow handle housing said motor, a non-perforated plate, said plate situated between the said shearing section and the said motor covering such motor and underlying the said shearing means in the form of a non-perforated receptacle to receive hair sheared by such shearing means, said non-perforated plate having a wall portion situated at a level above the said plate, said wall portion having an opening, a connectable element, said element located within said opening, the lower portion of said connectable element adapted to engage the said motor and the upper portion of such connectable element engageable with means upon the said vibrator for moving such vibrator to operate said reciprocatory member for shaving purposes, said spring-hook-and-lip connection adapted to be disconnected to permit the said assembled shearing section to be hinged away from said receptacle, means for sustaining said assembled shearing section in such hinged away position, said assembled shearing section adapted to be hinged back into normal shaving position upon the said handle and be held in such position by the said hook-and-lip connection interlocking with each other, and means to operate the said motor to move the said connectable element for oscillating the said vibrator to cause the said upper stem portion to move the said reciprocatory shearing member within the said stationary shearing member for shaving purposes.

3. A shaving implement comprising a hollow casing serving as a handle and an assembled shearing section, said assembled shearing section consisting of a carrier and shearing means and a stem structure, said shearing means comprising a stationary shearing member and an inner moveable shearing member, each of said members having a floor section, the floor section of said stationary shearing member having an enlarged centrally located opening and the floor section of the said moveable shearing member having a centrally located grooved opening, said carrier having a floor, said floor having a centrally located spaced opening, said stem structure comprising a shaft section having a stem element extending therefrom, and an off-set portion shaped into a vibrator structure, said vibrator structure having a flat surface provided with a pair of spaced apart pillars, said carrier having a rib section, said rib section having a recessed portion, said stationary shearing member secured to the upper portion of said carrier, said stem structure carried by the lower portion of the said carrier having the said stem element located within the said spaced opening and within the said enlarged opening and the upper portion of said stem element positioned within the said grooved opening and having the said vibrator positioned within the said recessed portion of the said rib section, a motor, said hollow handle housing said motor, a non-perforated plate, said plate located between the said shearing section and the said motor covering the said motor and simultaneous-

ly therewith underlying the said shearing means providing a non-perforated receptacle to receive hair sheared by such shearing means, a wall portion adjacent to the said non-perforated plate, said wall portion having an aperture, a post associated with said motor, said post located within the said aperture, the upper portion of said post adapted to be positioned between the said spaced pillars adjacent to the said flat surface when the said shearing section is placed into position for shaving purposes, said upper portion of said post adapted to press against one of said pillars moving said vibrator towards one direction and then press against the other of said pillars moving such vibrator towards the opposite direction thereby oscillating the said stem portion for moving the said inner movable shearing member within the said stationary shearing member for shaving purposes, the said carrier adapted to be removed from said shaving position into a non-shaving position carrying with it the said shearing members and the said stem structure assembled as a unitary structure disengaging the said vibrator from the said upper portion of said post, and means for operating the said motor to cause the said stem element to oscillate the said vibrator into desired directions.

4. In a shaving implement as defined in claim 3, wherein the said carrier is provided with aligned openings and the said shaft of the said stem structure is positioned within the said aligned openings.

5. A shaving implement, said implement comprising a handle and an assembled shearing section, said assembled shearing section comprising a carrier and a stem structure having a stem element and shearing means, said carrier carrying said shearing means and also carrying said stem structure, said stem element engaging the said shearing means, said carrier having rib portions, said rib portions having grooved sections, said stem structures having two vibrators each positioned within one of said grooved sections, said assembled shearing section secured to the said handle and held thereon in normal shaving position, said handle having a compartment, a motor, said compartment housing said motor, an imperforated plate normally separating said compartment from the said assembled shearing section, two of the side portions of said structure each provided with an opening, two moveable posts located within said handle, the lower portions of each said two posts connected to said motor and the upper portions of such posts each protruding through one of said openings for engaging one of said vibrators when the said shearing section is in said normal shaving position, and a source of power for operating said motor to swing the said two posts for oscillating said vibrators to move the said stem element for operating the said shearing means for shaving purposes.

6. A shaving implement, comprising a casing serving as a handle and an assembled shearing section secured thereon, said assembled shearing section comprising a carrier and shearing means and a stem structure having at least one stem element, said carrier carrying said shearing means and also carrying the said stem structure, said stem element engaging the said shearing means, the said stem structure having at least one vibrator, said carrier having at least one grooved recess, said vibrator positioned within said grooved recess, said handle having a compartment, a motor, said compartment housing said motor, a non-perforated plate normally separating said compartment from the said shearing means, said casing having at least one outer opening, said opening located adjacent to said non-perforated plate and extending inwardly into the said motor compartment, movable means within said opening, the lower portion of said movable means extending into the said compartment and engaging the said motor and the upper portion of said movable means protruding through said opening and located above said plate for engaging the said vibrator, said casing having side wall portions, one of said wall portions having a

side opening, a drawer having a non-perforated floor, said drawer positioned within said side opening having its non-perforated floor underlying the said shearing means providing a receptacle to receive sheared hair thereon during shaving operation and having its front portion covering the said side opening, and means for operating said motor to swing the said movable means for oscillating said vibrator to move the said stem element for operating the said shearing means for shaving purposes.

7. A shaving implement comprising a hollow casing 10 serving as a handle and a completely removable assembled shearing section, said shearing section comprising a carrier and shearing means and a stem structure having an angularly disposed vibrator, said carrier having a front portion, the underface of said front portion having a recessed section, said carrier carrying said shearing means and also carrying said stem structure having the said angularly disposed vibrator positioned within the said recessed section, said shearing means comprising a stationary shear member and a movable shear member; said 20 members provided with chambers having open end portions, closure means for covering said open end chamber portions of said shear members to prevent the escape of sheared hair therefrom while shaving, a motor, said handle casing housing said motor, a non-perforated plate, said plate covering the said motor compartment and underlying the said shear members in a manner providing a receptacle to receive thereon hair sheared by such shear members, said handle having a side opening located along- 30 side the said non-perforated plate, said opening extending into the said hollow casing, engageable means located within the said side opening, the lower portion of said engageable means extending into the said hollow casing and adapted to engage a portion of said motor, the upper portion of said engageable means adapted to engage a 35 portion of said vibrator for oscillating the said stem structure to move said movable shear member for shaving

ing purposes, said handle and the said shearing section provided with means for holding such shearing section in desired position upon the said handle for shaving purposes, and means connectable to a source of power for operating the said shearing section while shaving.

References Cited in the file of this patent

UNITED STATES PATENTS

1,757,978	Schick	May 13, 1930
2,051,343	Pamplin	Aug. 18, 1936
2,077,331	Knopp	Apr. 13, 1937
2,083,579	Schmitt	June 15, 1937
2,099,537	Schmitt	Nov. 16, 1937
2,105,775	Nilson	Jan. 18, 1938
2,107,207	Muros	Feb. 1, 1938
2,146,712	Collins	Feb. 14, 1939
2,164,425	Rand	July 4, 1939
2,186,091	Benner	Jan. 9, 1940
2,186,092	Benner	Jan. 9, 1940
2,223,310	Testi	Nov. 26, 1940
2,225,581	Berg	Dec. 17, 1940
2,232,717	Monnet	Feb. 25, 1941
2,245,981	Knopp	June 17, 1941
2,263,372	Verner	Nov. 18, 1941
2,270,800	Johnson et al.	Jan. 20, 1942
2,273,739	Te Pas	Feb. 17, 1942
2,298,872	Dalkowitz	Oct. 13, 1942
2,335,413	Hicks	Nov. 30, 1943
2,363,849	Bailey	Nov. 28, 1944
2,426,412	Pinkas	Aug. 26, 1947
2,600,658	Knopp	June 17, 1952
2,661,531	Streng	Dec. 8, 1953
2,787,053	Kleinman	Apr. 2, 1957

FOREIGN PATENTS

586,875	Great Britain	Apr. 3, 1947
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