This invention relates to the construction of shaving implements in general, and more particularly to a type operated by a motor and known as a dry shaver or electric razor. For clarification purposes I wish to point out the following:

The present type of electric shavers, wherein the shaving unit comprises a hollow stationary member having a movable member located therein, is so constructed that the shearing-face of the movable member is in constant engagement with the shearing-face of the stationary member; there is no space available therebetween for placing a brush to clean or remove the sheared hair from the individual shaver-sheets; such sheared hair usually clog up the tiny openings of such shaver-sheets thereby preventing the entrance therein of hair to be sheared, thus disturbing or minimizing the usefulness of such shearing members.

Such, as hereinabove described, may well occur with a newly purchased shaving unit, causing the user discomfort and expense.

In my present structure the abovementioned discomfort is completely eliminated. My shaving unit is so constructed that when the shaving section is hinged out of normal shaving position the movable shearing-face can easily be separated from the stationary shearing-face (as clearly shown in Figs. 3 and 4), and a suitable brush may be placed therebetween for cleaning such facing shearing-faces; thus, each of the shearing-faces of my shaving unit may be thoroughly cleaned as may be desired.

Furthermore, the present type of shaving units are constructed in such a manner whereby their individual base portions are each provided with a centrally located opening, and the motor (located within the handle) is provided with actuating elements for being positioned within such opening when the unit is placed in shaving position upon the handle. It is, to a certain extent, difficult for such actuating element to rest itself within such opening and then the small opening of the movable member for placing its upper portion therein to move such movable member for shaving purposes. The size of such element and openings are very precise in measurements for proper operable purposes. Occasionally, while securing such shaving unit into position upon the handle, pressure of the hand or finger upon the thin stationary shearing face will cause breakage of such thin shearing face. It is thus quite difficult for the average user to attach or secure his shearing section or shaving unit into shaving position upon the handle of his electric shaver.

In my present structure the base portion of my shaving unit is not provided with small openings for the upper thin portion of an actuating element to be placed therein. My structure is not in need of such thin actuating elements as are the present type electric shavers. My present structure is provided with a pivotal actuating bar situated substantially parallel to the floor of the shearing seat of the handle and the inner movable shearing member is provided with a centrally located slot or recessed section having angularly disposed bottom sections, so that when my shaving unit is placed into position for shaving purposes the angularly disposed bottom portions will lead the oscillatable or actuating bar into the centrally located slot for operable purposes. It may be noted that in this particular form of structure the measurements need not be so very precise as with the old type of structure, thereby facilitating the manufacturing operation of my present structure.

It will thus be seen that an object of my present invention is the provision of a shaving unit wherein each of the faces of the shearing portion or shearing-face may be easily cleaned thereby prolonging the usefulness of such shaving unit.

Another object of my present invention is the provision of an oscillatable or actuating bar structure situated substantially parallel to the floor of the shearing seat of the handle for engaging the movable shearing member for shaving purposes.

A further object of my present invention is the provision of an electrically operated shaving implement wherein the motor structure located within the handle casing is provided with two separate individual sets of cord-connecting prongs, and the handle casing is provided with two openings each located in alignment with one of such individual sets of prongs, and wherein such handle casing is provided with means for closing one of said openings and uncovering the other of such openings.

And a still further object of my present invention is the provision of an electrically operated shaving implement wherein the entire motor assembly is positioned slidably within the handle casing of the implement and thus held therein for operable purposes.

To illustrate the ordinary commercial utility of my shaving implement in daily use; a shaving implement made in accordance with my invention, of whatever style or type it may be made, could be utilized to great advantage; the fact that in my structure each of the face-portions of the shearing-faces may be easily cleaned will prolong the usefulness of such shearing-faces; and the fact that in my structure the measurements need not be very precise (to the thousandths of an inch) will, naturally, facilitate the manufacturing operation of my shaving implements and reduce the cost of same; and also, the fact that in my present structure the user can easily place the shaving section or shaving unit upon the handle structure, without the necessity of fitting actuating members into openings of such shaving units, will greatly minimize breakage of the thin shearing-faces of the shaving units, thereby prolonging the life and usefulness of my shaving units. It can thus be seen that a shaving implement made in accordance with my invention, solves very important problems in the art of making electric shavers, and is therefore from a business point of view, a practical and very important contribution to the electric shaver industry.

The variety of possible applications of my novel construction in connection with different types of shaving-implements, as hereinabove indicated, is so prolific that for the purpose of illustrating my 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 must 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, an electrical shaving-implement constituting a dry shaver, so that the principles of construction may be best illustrated in a dry shaver known as an electrical shaving-implement.

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

FIG. 1 is an angularly disposed perspective view of my shaving-implement with the assembled shaving section in a hinged-open position, showing the pivotal actuating bar structure located substantially parallel to the floor of the shaving seat of the handle for engaging and moving the inner movable cutter member into frictional engagement with the stationary shaving member for shaving action therebetween and also showing the two individual sets of connecting arrangement for connecting a cable-cord thereto;

FIG. 2 is a view partly in cross-section taken along the line 2—2 of FIG. 1, showing the assembled shaving section in closed position for shaving purposes, and also showing part of the motor structure and the transformer in a position disconnected from each other;

FIG. 3 is a perspective view of my shaving unit, partly in cross-section, showing the location of the inner movable shaving member, having its shear-face spaced away from the shear-face of the stationary shaving member for a brush to be positioned therebetween for removing sheared hair therefrom and also showing the pivotal means carried by the shaving units for connecting such units to the carrier;

FIG. 4 is a cross-sectional view taken along the line 4—4 of FIG. 3, showing the spaced section between the stationary and movable shear-faces;

FIG. 5 is a view of my shaving unit in closed shaving position, partly broken away, showing the pivotal actuating bar engaging and pressing against the spring section for urging the shear-face of the inner movable shaving member into frictional contact with the shear-face of the stationary shaving member for shaving purposes;

FIG. 6 is a perspective view of the receptacle for covering the motor compartment and underlining the shaving section and also for carrying pivotal actuating bar;

FIG. 7 is a view, partly in cross-section, showing one of the pivotal end portions of the carrier;

FIG. 8 is a view, partly in cross-section, showing the spring-element connecting the carrier to the receptacle;

FIG. 9 is a view showing the connection between the carrier and the motor structure;

FIG. 10 is a view, partly in cross-section, showing the manner in which the oscillatable element is placed into position within the openings of the side wall portions of the receptacle;

FIG. 11 is a view, partly in cross-section, showing the actuating bar carried by the receptacle in a manner suspended above the floor of the shaving seat substantially parallel to such floor for simultaneous engagement with a plurality of shaving heads;

FIG. 12 is a perspective view of the washer;

FIG. 13 is a perspective view of the under portion for operating the actuating bar;

FIG. 14 is perspective view of the spring section carried by the inner movable cutter member;

FIG. 15 is a perspective view of my inner movable cutter member, partly broken away, showing the manner in which the spring section is secured thereon;

FIG. 16 is a bottom view of the base portion of my stationary shaving member;

FIG. 17 is a cross-sectional view taken along the line 17—17 of FIG. 16, showing the manner in which my assembled shaving unit is placed into position upon the carrier;

FIG. 18 is a view showing the manner in which my stationary shaving member is constructed;

FIG. 19 is a view showing a section of the base portion of my stationary shaving member;

FIG. 20 is a view, partly in cross-section, showing a part of the inner front portion of my shaving implement, with the shaving section in closed shaving position, showing the interlocking structure thereof;

FIG. 21 is a view in perspective showing one of the joined end portions of my oscillatable structure in separated position;

FIG. 22 is a view of the portions in FIG. 1, the head portion broken away, showing the assembled structure thereof;

FIG. 23 is a view showing another form of assembling the end portions of my oscillatable structure; and

FIG. 24 is a view partly in cross-section, showing the motor structure of FIG. 1 in connected form.

I am showing the figures herein for Illustrative purposes, for a better understanding of my invention, to be able to properly describe the herein invention, and not for limitation purposes.

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 the handle structure of my shaving implement and arrow B indicates my assembled shaving section of such shaving implement.

Numerals 5 indicates the handle-casing for housing the assembled motor structure M, and 7 indicates the carrier for holding the shaving units 8.

The individual assembled shaving unit 8 comprises a stationary shaving member 11 having a shear-face 12 (FIGS. 2—5) and an inner movable cutter member 14 having a shear-face 15.

The stationary shaving member 11 is constructed in the following manner: The side portions 16 of the shear-plate 17 (FIG. 18) are each placed upon one of the faces 18 of end members 19 having the flaps portions 21 bent over such side portions 16 and pressed against the faces 18 clamping such side portions 16 therewith as shown by numeral 22. The end portions 24 of the members 19 are then shaped in a suitable manner, for example as indicated by arrow C (FIG. 16), and are brought together and secured to each other by suitable means, for example, by a welding process thereby forming the base portion 46 (provided with an elongated spaced section or slot); the shear-plate 17 then assumes a suitably curved shape for example as indicated by arrow D (FIG. 4) in a manner whereby the centrally located perforated portion 17' of the plate 17 (FIG. 18) will serve as the peak portion of the shear-face as indicated by numeral 12. The joined portions 26 are shaped in a manner providing angularly disposed flange portions 27 (FIG. 17) serving as guiding means to facilitate the placing of the playful of the stationary shaving member into position upon the carrier 7.

The inner movable cutter member 14 may consist of a channel-shaped portion having the shear-face 15 shaped in a style corresponding to the shape of the shear-face 12 (FIG. 15) to cooperate therewith for shaving purposes. Such inner movable cutter member 14 is provided with a plurality of flange portions 31, each having inclined bottom portions 32 terminating into a recessed or grooved sections 33. Each of such flange portions 31 are provided with openings n and n' for housing a pin 35 and a pin 35' therein. A spring section 36 provided with a coiled portion 37 and with recessed sections 38 and having its end portions 36' bent over providing elongated slots 39 is carried by the pin portions 35 and 35' in a manner having its recessed section 38 located in alignment with the grooved section 33 for a purpose which will be hereinafter explained.
The carrier 7 (FIG. 1) is made like a frame or bottomless box. It comprises a front portion 41 a rear portion 42 and two side portions 43 and 43' shaped in a manner providing an enlarged opening or spaced section therebetween. A springable element 44 is carried by the shoulder portions 45 and 45' of the base portion 46. A stationary shearing member (FIGS. 3, 5 and 16), so that when the shaving unit 3 is placed into position upon the carrier 7 such springable elements 44 will each be pressed into position underneath the side portions 43 and 43', as shown by numeral 44', and thus be held secured in desired position. The portions 27' of the flange portions 27 (FIG. 17) will gauge the location of such unit in its position.

The receptacle indicated by arrow R (FIG. 6) comprises a non-perforated floor 51, side wall portions 52 and 52' each having a flanged portion 53, and wall portions 54 terminating into extensions 54. The side wall portions 54 are each provided with openings 55 (FIGS. 1, 6, 10 and 11), an oscillating element O is positioned through the openings 55 into depressed position within the receptacle R, a washer 56 having a through opening 57 is positioned within the opening 55 in a manner whereby the end portions 58 of the element O are positioned within the openings 57 of the washers 56, a U-shaped member 61 is placed under the receptacle R having the openings 61' of its two flanged wall portions 61' snap into position housing therein the end portions 58 of the element O (FIG. 11), the wall portions 62 of each of such openings 61' are then pressed into the grooved sections 63 of such end portions 58 (see FIG. 23); the head portion 63' of the end portion 58 is broken away to clearly show the manner of assembling the end portions of the oscillating structure (FIGS. 21 and 22). The washer 56 is provided with a circular wall portion V for limiting its movement when placed into the opening 55 and for covering the joint between the washer portion 56 and the wall opening within the wall portion 52 as indicated by the numeral 56' (FIG. 11) thereby forming a snug fit of such washer within its seat in the opening 55.

The floor portion 65 of the U-shaped member 61 is provided with an elongated slot or opening 66 for receiving therein an offset pin portion 67 (FIG. 2) of the motor M, so that when the pin 65 will be rotated the offset pin portion 66 located within the opening 66 will move the floor portion 65 sideways to and fro, the two flanged wall portions 61' being secured tightly to the end portions 58 of the member O will move or rotate, partly the end portions 58 within the opening 57 of the washer 56 thereby moving the actuating bar structure O, as indicated by the dotted lines 32' (FIGS. 3 and 5), for operating the inner cutter member 14 for shaving purposes. When the shaving unit 3 is located in a non-shaving position, the movable cutter member 14 will then be in a relaxed position, having its shear-face 15 spaced away from the shear-face 12, thus the user will be able to clean, or remove sheared hair, from each side of the shear faces 12 and 15 without removing the inner cutter 14 from the outer cutter 11.

As before pointed out, the difficulty of placing the ordinary type of shaving unit into position upon the handle structure, due to the fact that the small opening of the base portion thereof must first locate the small head portion of the actuating element before such shaving unit can be so positioned, is completely eliminated in my present structure. My present structure does not require any of such small head portions of actuating elements, nor does it require small openings within the unit's base portion for locating such actuating elements. My actuating structure O comprises two side end sections 58 and a centrally-located elongated portion or bar b extending outwardly or upwardly of the end sections 58, so that when my shaving unit 3 is placed into normal shaving position my actuating bar structure, being positioned cross-sectionally of the units 8, will be led by the inclined bottom portions 32 into the recessed portions 33 of the motor M positioned therebetween and secured thereto by suitable means, for example, screw sections 72 in a manner forming a unitary structure of the motor M and the receptacle R.

The motor structure M (or the receptacle R) may be provided with rib portions 73, and the casing 5 may be provided with recessed sections 74 for receiving therein such rib portion 73 and hold same in desired position as shown by numeral 75 (FIG. 2). The rear portion 42 of the carrier 7 is at both of its end portions provided with a shoulder portion 76 terminating into a slitted end portion 76'. The shoulder portions 76 are each adapted to be positioned within one of the cut-out sections 78 formed within the wall portions 52 and 52' of the receptacle R. A coil spring 79 having an extended loop portion 79' is positioned upon the said slitted end portion 76', having its hook portion 79' positioned within the slot of the end portions 76' upon which it is located and having its loop portion 79, positioned over the shoulder portion 81 of the side wall portion 52, and in side wall portion 53 (wall structure 53 not shown), and held in position by the shoulder head (or heads) 81', thus holding the carrier 7 in position upon the receptacle R in a spring-tensional manner (FIGS. 7 and 8).

The front portion 41 of the carrier 7 is provided with hook portions 82 (FIGS. 1 and 20) and the front portion of the casing 5 is provided with an outer movable or slidable plate-structure 83 carrying secured thereto a plate 84; such plate 84 is provided with flanged portions 85 for engaging the hook portions 82, which are positioned through the openings 34 of the front extension 34 into position for such engagement, when such plate 84 is placed in normal position upon the handle structure 5 (FIGS. 1 and 20); thus holding the shaving section B in normal shaving position upon the handle section A for shaving purposes.

The spring section 36 may, if so desired, be provided with only one of the coils 37; or it may consist of only one of the elongated portions of such spring section 36, in which case the lower parts of the flange portions 31 of the movable shearing member 14 may be shaped in a manner located closer towards each other, for example as indicated by the dotted lines 31' (FIG. 2), and be held therewithin in an upright position as indicated by the letter d, having its recessed section 38 located upon the elongated actuating bar b in a centrally located position with respect to the unit 8 as indicated by the letter b', for proper balancing the inner movable cutter member 14 when tensioning it towards frictional engagement with the shear-face of the outer shearing member 11 for shaving purposes (FIGS. 2 and 11).

If desired, the inner movable cutter member may be provided with suitable means, for example a shoulder portion for engaging part of the base a portion 31' of the outer shearing member, as shown by numeral 31'; thereby preventing complete removal of the inner cutter member from its position within the outer shearing member, thus always retaining proper position of the shear-
face of the inner movable member with respect to the shear-face of the outer shearing member for proper shaving operation.

I desire it to be understood that while I show my inner movable cutter member provided with two facing flange portions 31, yet, if desired, such inner movable cutter member may be so constructed as to be provided with only one flange portion, and wherein such one flange portion may be provided with inclined faces 32 and with a recessed portion 33 similar to that of my present structure as shown in my inner movable shearing member 14; and wherein the recessed portion of such one flange portion may be positioned upon the elongated actuating bar 3 in the same manner as indicated by the dotted lines 31' with respect to the inner movable shearing member having two flange portions 31 (FIG. 11); as above stated, the disclosures herein are for illustrative purposes only and not for limitation purposes. For example; if desired, the end portion 56 of the wall portions 61’ may each be provided with a slot or open end portion 96 adapted to be slidably positioned within the grooved sections 63 of the end portions 58, having the end portions of the walls 96’ bent over the body portion 98 as shown at 97 (FIG. 23), thus locking firmly the end portion 61’ of the U-shaped member 61 within the grooved end portions 58 of the oscillatable actuating structure 0 forming a unitary structure thereof.

I desire it to be understood that my present actuating structure may be utilized in connection with various types of shaving units, the disclosures herein are for illustrative purposes only and not for limitation purposes.

In many of the figures I have shown daylight-space between the parts, this was done for clarification purposes only in order to better describe the structure herein.

My motor M, located within the handle casing 5, is provided with a set of prongs 94 for connection with a cable-cord (cable-cord not shown) and my handle casing 5 is provided with an opening 1 to pass therethrough a plug of such cable-cord for such connection. The other end portion of such cable-cord may be connected to a source of power to provide such motor M with means to operate the shearing section for shaving purposes.

Motor M is provided with an element or side portion 6 which may be secured thereto by various suitable means; for example, a screw member 91'. To this element or side portion 6 is secured, by suitable means, for example, such as a screw element 91', a transformer T. This transformer 91' is provided with a set of prongs 94’, and the casing 5 is provided with an opening 2 located directly in alignment with the set of prongs 94’.

The transformer T is provided with two sets of sockets 4, 4; and the motor M is likewise provided with two sets of sockets 4, 4’. The transformer T is provided with a through opening housing therein a member having a screw-threaded end portion 1’ and a head portion 3’. The bottom portion of my handle casing 5 is provided with an opening 3 located opposite the head portion 3’ for a purpose which will be hereinafter explained.

An element 92 having a screw-threaded opening is carried by the screw-threaded end portion 1’; this element 92 is provided with a pair of prongs 93, 93; the longer portions of these prongs 93, 93, are located within the set of sockets 4, 4; the shorter portions of such prongs 93, 93, are located in a position spaced away from the socket portions 4, 4'; such element 92 is also provided with a plate 92' covering the opening 2 and the set of prongs 94'.

From the above it is clear that, when the element 92 is located in a manner as shown in FIG. 2, wherein the prongs 93, 93, are not connected with the sockets 4, 4'; and the plate 92' is covering the opening 2 of the handle casing 5 and is also covering the set of prongs 94', in such case the user can utilize only the opening 1 and the set of prongs indicated by the numeral 94. Assuming that the shaver is used in the United States, the motor M would then be adapted to the volume of electric power used in the United States. However, if the implement is brought into Great Britain, where the electric-current used is of a different volume, then all the user has to do is to replace a screwdriver through therefore the slot of the head portion 93' and rotate the end portion 1' into desired direction moving the element 92 forwardly bringing the pins or prongs 93, 93, into engagement with the sets of sockets 4', 4', and simultaneously therewith causing the plate 92' to cover the opening 1 and the set of prongs 94', while at the same time uncovering the opening 2 and the set of prongs 94' holding same in readiness for use in connection with a cable-cord plug (see FIG. 24). It being understood that the connection of the transformer T with the motor M will adjust the volume of electric power to suit the shaver. The fact that the movable means is completely incased within the handle casing 5 will prevent accidental rotation of the threaded end portion 1' thereby assuring positive stationary adjustment of my herein structure.

Although I am showing the openings 1 and 2 being located in the wall portion 9' of the casing 5, it is naturally understood that such openings 1 and 2 including the sets of prongs 94 and 94' may be located at any other suitable portion of the handle casing 5.

The plate 92' of the element 92 may, if so desired, be eliminated; and the handle casing 5 may be provided with a sliding cover as indicated by the dotted lines 99, for covering the set of prongs 98' and uncovering the other set of prongs 97 or, for covering such set of prongs 97 and uncovering the set of prongs 98'.

While I have shown the movable connecting means between the motor M and the transformer T, I could do in a manner as illustrated in FIGS. 2 and 24, yet, various other parts, or elements of other designs or forms, may be utilized to provide movable connecting means between the motor M and the transformer T. I am showing the herein illustrations for clarification purposes only and to be able to clearly describe my present invention.

It is thus clear that after the proper adjustment has been made, all the user will have to do is to move the starter L of the handle casing 5, and the shaving implement will then be in a workable position for shaving purposes without damaging the motor M located within the handle casing 5.

From the above it will be seen, that I have invented and perfected a shaving implement provided with an operable mechanism of a new and unique design and structure, a shaving implement which is practical and useful, economical to be manufactured and commodious of commercial value; and although I have shown certain preferred forms or illustrations in order to describe and explain the operable structure and 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; shaped, formed, styled or arranged in any suitable manner, and assembled in any suitable manner or combination, wherein the parts may be easily taken apart, removed, 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 comprising a handle having a seat for holding thereon at least one individually assembled shaving unit, said seat having a non-perforated
floor provided with side walls, said shearing unit comprising an outer shearing member and a cooperating movable cutter-member, said movable cutter-member having a bottom portion provided with a centrally located recessed section disposed cross-sectionally of said shearing unit, a pivotal actuating bar, said actuating bar comprising end portions for pivotal engagement with the said side walls and a centrally disposed bar portion, said bar portion located above said end portions and suspended cross-sectionally over the said floor substantially parallel therewith for engagement with said recessed section of the said movable cutter member to urge such movable cutter member into cooperation with the said outer shearing member for shaving purposes, and means for moving the said bar.

2. A shaving implement comprising a handle having a seat for supporting thereon a plurality of individually assembled shaving units, said seat having a floor portion, each of said units comprising an outer shearing member having a movable cutter member cooperating therewith for shaving purposes, each of said movable cutter members having a bottom portion provided with a centrally located recessed section, a pivotal actuating bar, said actuating bar situated cross-sectionally of the said plurality of shaving units substantially parallel to the said floor portion for simultaneous engagement with each of said recessed sections to urge each of said movable cutter members into cooperation with its respective outer shearing member for simultaneous operable action of the said individual shaving units for the said shaving purposes, and means for moving the said actuating bar.

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