

May 21, 1940.

L. SCRUGGS

2,201,349

ELECTRIC RAZOR

Filed March 20, 1937

2 Sheets-Sheet 1

FIG. 1.

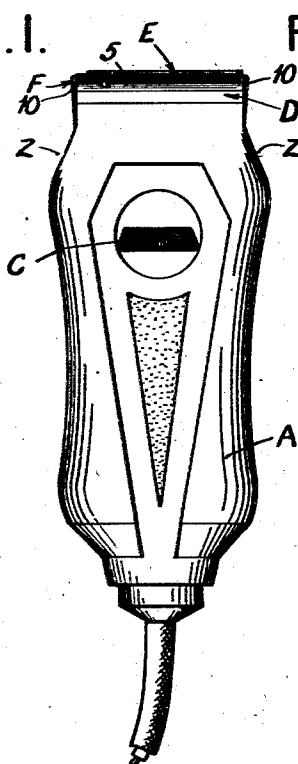


FIG. 2.

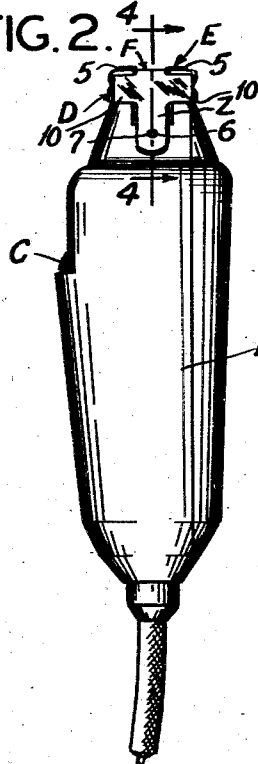


FIG. 3.

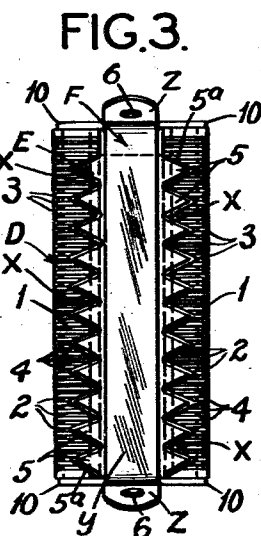


FIG. 5.

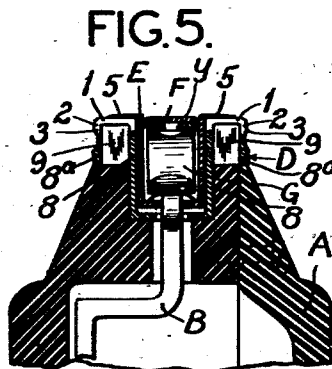


FIG. 4.

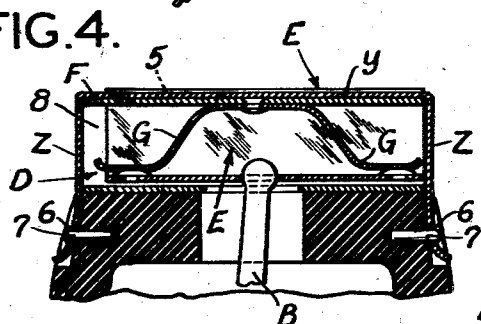


FIG. 11.

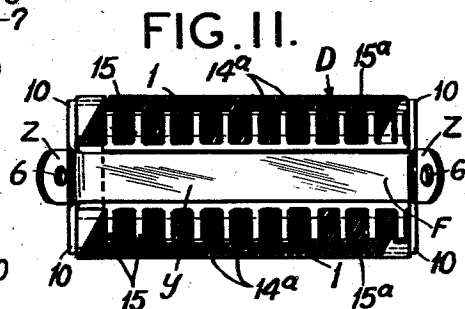
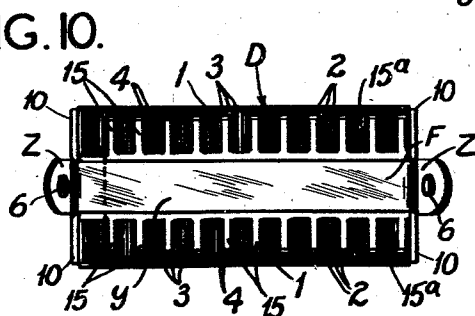


FIG. 10.



INVENTOR;
LOYD SCRUGGS
BY *Nello L. Chumak*
ATTORNEY

May 21, 1940.

L. SCRUGGS

2,201,349

ELECTRIC RAZOR

Filed March 20, 1937

2 Sheets-Sheet 2

FIG. 6.

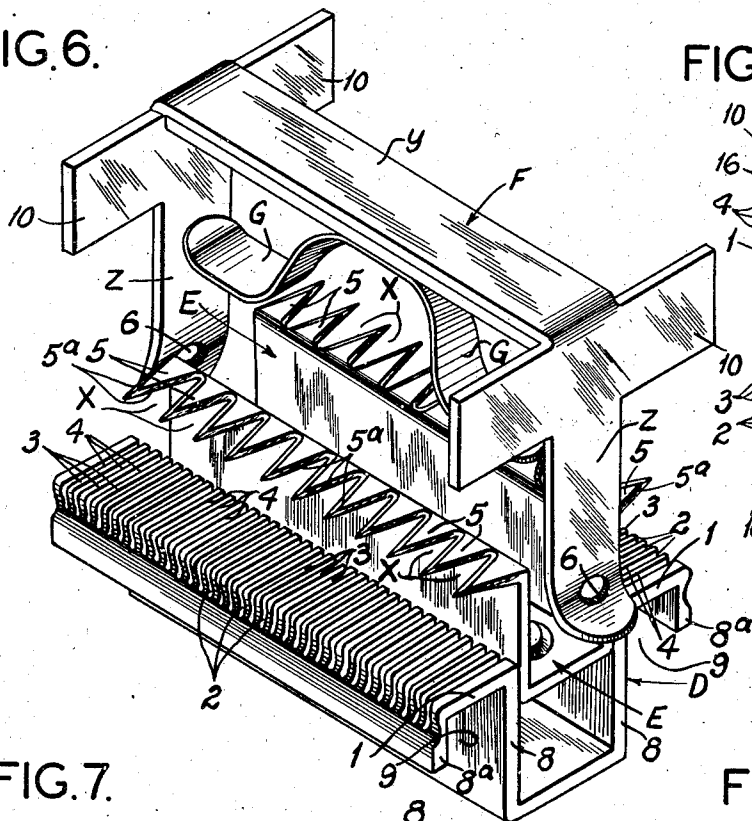


FIG. 12.

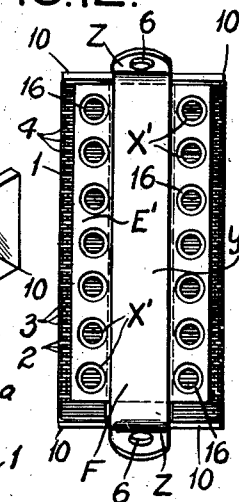


FIG. 7.

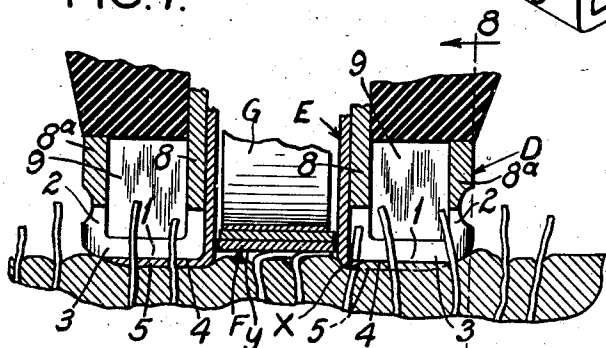


FIG. 9.

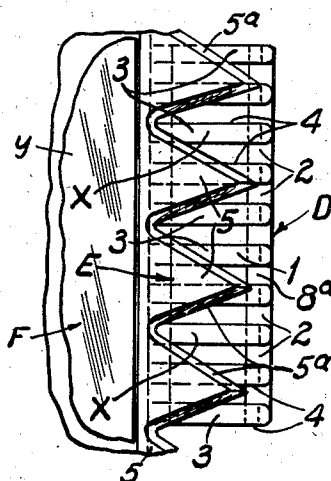
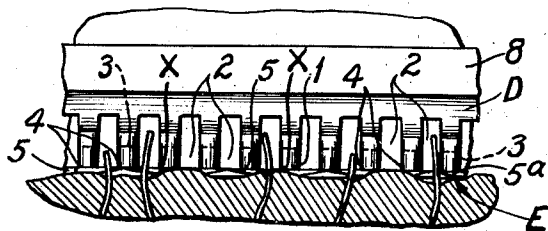


FIG. 8.



INVENTOR;
LOYD SCRUGGS
BY *Nellie L. Church*
ATTORNEY

UNITED STATES PATENT OFFICE

2,201,349

ELECTRIC RAZOR

Lloyd Scruggs, University City, Mo.

Application March 20, 1937, Serial No. 132,031

6 Claims. (Cl. 30-43)

This invention relates to razors of the type commonly referred to as "electric razors" that comprise a stationary cutter which coacts with a movable cutter that is moved relatively to the stationary cutter by an electric motor, vibrator or equivalent electrically operated or mechanically operated means, and particularly razors of the kind that are now being used extensively for removing hair or whiskers from skin without the aid of water, soap-lather, shaving cream, or a similar medium.

The main object of my invention is to provide a mechanically operated device for removing hair or whiskers, hereinafter referred to for convenience as an electric razor, that will produce a closer shave and a quicker shave than is possible to obtain with any of the various makes or kinds of electric razors now on the market.

Another object is to provide an electric razor which is of such design that the hair or whiskers removed from the skin during the shaving operation, are effectively prevented from dropping onto the user's clothing.

And still another object of my invention is to provide an electric razor which, in addition to accomplishing the results above mentioned, is of rugged construction, is inexpensive to manufacture and easy to take apart for cleaning or inspection, and is of such design that it is practicable to make the skin-contacting portion of same of such shape and area that the user will naturally hold the razor in the position in which it operates most efficiently. Other objects and desirable features of my invention will be hereinafter pointed out.

My improved razor, briefly described, consists of or comprises a stationary cutter having cutting teeth separated from each other by slots, each of a width sufficient to receive a hair or whisker but not wide enough to permit the skin to enter the same, and a movable top cutter arranged between said stationary cutter and the user's skin and constructed so that during the shaving operation said movable cutter will remain in direct contact with the skin and will travel over the skin and exert pressure on same in a direction to positively cause the skin to protrude inwardly through the gaps, openings or spaces in the movable cutter and come in direct contact with the upper side of the stationary cutter, said movable top cutter preferably having bevel-edged cutting elements disposed so as to coact with the teeth of the stationary cutter to sever the hairs or whiskers at the surface of the protruding portions of the skin and also to

guide the skin into and out of the gaps or openings in the movable cutter during its travel over the skin. The movable cutter is preferably reciprocated back and forth over the stationary cutter and the bevel-edged cutting elements of said movable cutter are arranged with their beveled sides presented to the user's skin and their sharp edges disposed so as to flank or form the side edges of relatively wide-mouthed V-shaped gaps in one edge of the movable cutter. I wish it to be understood, however, that the movable cutter of my improved razor may be provided with gaps of various shapes and may be constructed and operated in various other ways without departing from the spirit of my invention so long as it is designed to definitely and positively cause portions of the skin to be arranged in contact with the stationary cutter at the time when the hair or whiskers on said portions are being severed. In the preferred form of my invention herein illustrated the stationary cutter of the razor is provided with two groups of cutting blades arranged in spaced relationship, and the movable cutter is arranged above the stationary cutter and is provided with two groups of cutting blades arranged in spaced relationship and disposed so as to press directly against the skin and cause the hair on the skin to be severed by the simultaneous action of the two groups of blades of the movable cutter with the two groups of blades of the stationary cutter. The movable cutter is held in operative relationship with the stationary cutter by a retaining member that laps over the movable cutter. Said retaining member may be constructed in various ways without departing from the spirit of my invention, but in the particular form of my invention herein illustrated said retaining member is provided with a stationary skin contacting portion disposed so as to lie in substantially the same horizontal plane as the skin contacting surfaces of the cutting blades of the top cutter and engage a zone of the skin that lies between the two zones from which hair is being removed simultaneously by the conjoint action of the two sets of movable and stationary cutting blades.

In comparison with dry shaver razors of conventional design, my razor is distinguished from the various makes of razors now being offered to the public in the following respects:

(1) the movable cutter constitutes the top cutter of the razor and is arranged so as to bear upon and remain in direct contact with the skin that is being shaved; (2) said movable top cutter is provided with holes, openings, gaps or

spaces of such size that in the shaving operation the skin will be definitely forced inwardly through said gaps, into engagement with the upper side of a stationary cutter that excludes the skin, thus causing the hair or whiskers to be severed at the surface of the skin instead of at a point away from the skin corresponding to the thickness of the skin-contacting portion of the razor; and (3) the top cutter or movable cutter of the razor, instead of being formed by a slotted member provided on its underside with square-edged cutting teeth that coact with similar teeth on the opposed cutting member, is composed of a group or series of bevel-edged cutting blades or substantially inclined edged cutting blades that are separated by gaps or spaces of sufficient width or size to insure the skin entering said spaces and thus cause the hairs or whiskers to be so located that they will be severed rapidly, flush with the surface of the skin.

Obviously, such a razor will produce as close a shave as can be obtained with a manually operated razor of either the straight blade type or the safety type, because there is no portion which holds the coacting cutting edges of the razor spaced away from the skin a distance equal to the thickness of the skin-contacting portion of the razor. In addition to producing a close shave, my improved razor produces a rapid shave because the relatively large holes, openings or gaps in the movable cutter make it possible for the hairs or whiskers to easily assume the correct position to be acted upon by the coacting cutting edges of the razor, and permit a relatively great number of hairs or whiskers to be positioned in each of said openings or gaps at the same time, with the result that many whiskers, instead of only one or two whiskers, will be severed by each cutting blade at each stroke or movement of same. In addition to the above noted differences in construction and principle of operation, my improved razor is preferably provided with one or more closed chambers arranged so as to receive and hold the whiskers or hair removed from the skin during the shaving operation, and said chambers are preferably constructed in such a way that the collected hair or whiskers therein can be quickly and easily ejected therefrom, simply by opening up the chamber and blowing into same.

Figure 1 of the drawings is a side elevational view of my improved electric razor.

Figure 2 is an elevational view taken at right angles to Figure 1.

Figure 3 is a top plan view of the razor.

Figure 4 is a vertical longitudinal sectional view taken on the line 4—4 of Figure 2.

Figure 5 is a vertical transverse sectional view.

Figure 6 is a perspective view showing the cutters and the clamping or retaining device partially disassembled so as to illustrate the construction of same.

Figure 7 is an enlarged fragmentary sectional view illustrating the action of the razor on the skin during the shaving operation, the right hand portion of said figure showing how the skin protrudes through the gaps in the movable cutter and contacts with the stationary cutter, and the left hand portion of said figure showing one of the blades on the movable cutter in section.

Figure 8 is a fragmentary sectional view taken on the line 8—8 of Figure 7 looking in the direction indicated by the arrows.

Figure 9 is a fragmentary top plan view on

an enlarged scale, illustrating a portion of the movable cutter and a portion of the stationary cutter; and

Figures 10, 11 and 12 are top plan views illustrating other forms of my invention.

In the accompanying drawings which illustrate the preferred form and several modifications of my invention, A designates the handle portion of the razor which may be of any preferred design and size, but which is preferably shaped so as to be capable of being held conveniently in the hand of the user and constructed so as to serve as a housing for an electric motor, vibrator or equivalent element (not shown) that operates an actuating device B which imparts reciprocating movement to a movable cutter that cooperates with a stationary cutter, the said handle portion A being provided with a switch or starting device C of any suitable kind for starting or controlling the operation of the motor or other means that constitutes the source of power for the movable cutter of the razor. The stationary cutter of the razor is designated as an entirety by the reference character D and is herein illustrated as being formed by a member having two horizontally disposed portions 1 provided with numerous parallel open-ended slots 2 separated from each other by bar-like portions 3 whose top sides have sharp edges that constitute stationary cutting teeth 4, the slotted parts 1 of the stationary cutter D being arranged in spaced relationship and each of the slots 2 being of such width as to be capable of receiving a hair or whisker on the skin but not wide enough to permit the skin to substantially enter or project into the slot to such an extent that it will be cut, pinched or nicked by the movable cutter. As shown in Figures 6, 7 and 8, the outer ends of the slots 2 between the stationary cutting teeth 4 are open so as to permit the hairs or whiskers to easily enter the same during the shaving operation.

The movable cutter of the razor, designated as an entirety by the reference character E, is provided with two groups of cutting blades 5 that are arranged in overlapping relationship with the cutting teeth 4 of the stationary cutter so as to coact with said teeth to sever the hairs or whiskers when the movable cutter E is reciprocated by the actuating device B. As previously stated, the movable cutter is adapted to bear directly against the skin or contact directly with the skin from which hair or whiskers are being removed and said movable cutter is provided with holes, gaps or openings x of such size as to definitely cause the skin to enter said openings and thus insure the individual hairs or whiskers being severed or cut off at the surface of the skin. In order to attain this result, the cutting blades 5 are made flat on their under-sides so that they will bear squarely or evenly on the top side of the bar-like portions 3 of the stationary cutter which constitute the stationary cutting teeth 4, and the top surface of each cutting blade 5 is shaped or formed so as to produce beveled cutting edges 5a, or substantially inclined cutting edges, that form portions of the edges of the openings, gaps or spaces x in the movable cutter into which the skin protrudes during the shaving operation. In using the razor the handle A is held in such a position that the top side of the movable cutter E will remain in contact with and press against the skin, the pressure of said cutter against the skin causing the skin to protrude into the gaps x in said movable cutter and

press against the slotted portions 1 of the stationary cutter, without, however, entering the slots 2 in the portions 1. This causes the hairs or whiskers to be located in the slots 2 and hence the reciprocating movement of the movable cutter E causes the hairs or whiskers to be cut off flush with the surface of the skin. Due to the fact that the beveled top sides of the blades of the movable cutter are presented to the skin, the inclined portions of said blades which slope upwardly from the cutting edges of said blades, guide the skin progressively into and out of the gaps x and make it possible for the movable cutter to travel over the skin without liability of cutting the same and without chances of abrading the skin or subjecting it to a shock. In fact, the wave-like surface of the movable cutter E that is pressed against the skin, tends to produce a gentle massaging action on the skin that is beneficial and soothing to the skin.

In the form of my invention illustrated in Figure 6, the cutting blades 5 on the movable cutter are pointed or of substantially wedge-shape in general outline so that the two cutting edges of each blade will be disposed at an angle to the cutting teeth of the stationary cutter with which they cooperate. The outer ends of the V-shaped gaps or open spaces between the blades of each group of blades of the movable cutter, may vary in dimensions, but it is highly practicable to make the open ends of said gaps approximately .125 of an inch in width due to the fact that in the shaving operation the cutting blades 5 are firmly supported by the slotted portions 1 of the stationary cutter. Moreover, as the skin exerts pressure on the cutting blades 5 in a direction tending to force said blades tightly against the stationary cutting teeth with which they coact, the flat undersides of the blades 5 of the movable cutter will be sure to coact with the teeth of the stationary cutter to sever the hairs or whiskers at the surface of the skin during the shaving operation.

From the foregoing it will be seen that in my improved razor the movable cutter, instead of being provided with a skin-contacting portion varying from .004 to .010 of an inch in thickness that holds the coacting cutting edges spaced away from the skin a distance equal to the thickness of said skin-contacting portion, is so constructed that portions of the skin will contact with or press directly against the slotted portion of the stationary cutter that constitutes the stationary cutting edges, thereby causing the hairs or whiskers to be severed flush with the surface of the skin by the beveled edges 5a of the cutting blades 5 of the movable cutter which press upon or bear against the skin and force portions of the skin inwardly through the gaps or openings x in the movable cutter. Obviously, such a razor will produce as close a shave as it is possible to obtain with a conventional manually operated razor of either the straight blade type or the safety type, and such a razor will produce a quick or rapid shave because the gaps or openings x between the blades 5 are each large enough to receive a plurality of hairs or whiskers at the same time, and the angular arrangement of the cutting edges of the blades 5 with relation to the stationary cutting teeth 4, insures the cutting edge of each blade coacting with a plurality of stationary cutting teeth during each stroke or movement of the blade.

It is immaterial, so far as my broad idea is concerned, how the stationary cutter is mounted

on the handle portion A of the razor, and it is immaterial how the movable cutter is guided and combined with the stationary cutter, but I prefer to provide the stationary cutter D with a part that acts as a guide-way for the movable cutter E, and holds the cutting blades 5 of the movable cutter in yielding engagement with the cutting teeth of the stationary cutter by a retaining or clamping member F that laps over the movable cutter E and constitutes a stationary skin-contacting member that lies between the two groups of cutting blades 5 of the movable cutter. In the form of my invention herein illustrated, the movable cutter E is formed by a stationary U-shaped member reciprocatingly mounted in a guide-way portion of the stationary cutter that may be of various forms, and the cutting blades 5 project laterally in opposite directions from the vertical legs or side flanges of said U-shaped member as shown in Figure 6. As shown in Figures 4 and 5, the actuating device B projects upwardly through an elongated slot in the member that constitutes the stationary cutter, and is connected in any suitable way with the member that constitutes the movable cutter. The clamping or retaining member F previously referred to, that holds the movable cutter in operative relationship with the stationary cutter, is formed by a substantially inverted U-shaped member whose web or cross-piece y has attached to the under-side of same a leaf-spring G that projects downwardly into the U-shaped portion of the movable cutter E and exerts yielding pressure on the bottom web of same in a direction to hold the cutting blades 5 of the movable cutter in yielding engagement with the bar portions 3 of the stationary cutter. It is immaterial to what portion of the razor the clamping member F is attached, so long as said clamping member is held in such relationship with the stationary cutter D that the spring G will press the movable cutter E downwardly into engagement with the stationary cutter. In the form of my invention herein illustrated the depending legs or end flanges z of said inverted U-shaped clamping member F are provided at their lower ends with holes 6 that are adapted to be snapped into engagement with stationary retaining pins 7 on the handle portion A of the razor as shown in Figures 2 and 4. By constructing the razor in the manner above described, I obtain a razor having a wide skin-contacting portion, made up of the movable blades 5 and the stationary part y of the clamping member F, the area of said skin-contacting portion being so great that practically no skill on the part of the user is required to hold the razor in a position to produce efficient shaving. This is advantageous in that it makes it unnecessary for the average person to have to learn just how to hold the razor in order to obtain a satisfactory shave. Another advantage of such a skin-contacting portion is that the stationary intermediate part y of the same makes it possible to operate the movable cutter with less power than would be required if the entire area of the movable cutter E pressed against the skin.

As previously stated, one of the objects of my invention is to provide an electric razor which is of such construction that the hairs or whiskers removed during the shaving operation will not fall downwardly onto the clothes of the user. I accomplish this highly desirable result by forming the slots 2 in the stationary cutter so that they are open on their bottom sides and arranged

directly over one or more chambers disposed so that the hair or whiskers removed by the coating cutters will be sure to pass downwardly through said slots and enter said chamber or chambers and be confined therein. In the razor herein illustrated, the chamber or chambers above referred to, are preferably formed by coating portions of the handle A, of the stationary cutter D and of the clamping member F, but I wish it to be understood that my broad idea contemplates simply a closed space or chamber arranged so as to receive and hold the hair or whiskers removed from the skin, and constructed so that it can be easily opened to permit the collected substance in same to be discharged therefrom. In instances where the razor is equipped with a movable cutter provided with two groups of cutting blades that coact with two groups of cutting teeth on the stationary cutter, each slotted portion 1 of the stationary cutter is provided with two depending parallel parts 8 and 8a that coact with the terminal end of the handle portion A of the razor to form a hollow space or chamber 9 located directly underneath said slotted portion 1 as shown in Figure 5. The end walls of the two chambers 9 may be formed by laterally projecting wings 10 on the clamping member F that bear against the ends of the stationary cutter D when the clamping member F is arranged in operative position. To dislodge the hair or whiskers from the chambers 9 it is only necessary to release the clamping member F and move said member upwardly into a position where the user can blow through the chambers 9 to dislodge the hair that has accumulated in same. The parts of the stationary cutter that form the inner walls of the collection chambers 9 project downwardly into a recess or depression in the terminal end of the handle portion A of the razor, and the parts 8a that form the outer walls of said chambers, are proportioned so that the lower edges of same will butt against the terminal end of the handle portion A.

While I prefer to equip the movable cutter with pointed or wedge-shaped cutting blades 5 having beveled cutting edges disposed at an angle to the cutting teeth 4 of the stationary cutter as previously explained, the movable cutter could, if desired, be provided with straight cutting blades 15 having beveled cutting edges 15a, disposed at right angles to the axis of movement of the movable cutter as shown in Figure 10, the spaces, gaps or openings between the blades 15 of each group being of sufficient size to cause the skin to project into same and contact with the slotted portion or portions of the stationary cutter as previously explained. Figure 11 illustrates a razor equipped with a movable cutter of the kind shown in Figure 10, but provided with stationary cutting teeth 14a disposed at an angle to the beveled cutting edges of the blades 15 of the movable cutter. In Figure 12 I have illustrated still another form of my invention which differs from the forms previously described in that the spaces or gaps in the movable cutter through which the skin projects during the shaving operation, are formed by round holes x¹ in a movable cutter E¹, the top face or side of said movable cutter being shaped so as to form substantially beveled or inclined cutting edges 16 that surround the holes x¹, and which coact with the cutting teeth of the stationary cutter to sever the hairs or whiskers flush with the surface of the skin.

I am aware of the fact that U. S. Patent No.

2,031,519, dated February 18, 1936, to D. M. Winans, discloses an electric razor in which the movable cutter is arranged so as to come in direct contact with the skin from which the hair or whiskers are being removed, but in the said Winans razor the movable cutter is provided with slots that are too narrow to permit the skin to enter the same when said movable cutter is placed against the skin. In other words, in the razor described in said Winans patent the co-acting movable and stationary cutting edges are spaced away from the skin a distance equal to the thickness of the movable top cutter and hence in the shaving operation there will be left on the skin sections of whiskers of the same length as the thickness of the movable top cutter. My improved razor is designed to operate on an entirely different theory than the Winans razor and, as previously explained, is provided with a movable, top cutter which has openings, spaces or gaps in same, that are large enough to cause the skin to project into said openings and come in contact with the stationary cutter, thereby causing the whiskers to be severed flush with the surface of the skin instead of severed at a point beyond the surface of the skin. Another distinction between the preferred form of my invention and the Winans razor, is that the cutting edges on the movable blade of my razor are formed by beveled or inclined edged elements whose cutting edges exert pressure on the skin in such a way as to force the skin inwardly through the gaps between said elements, thus locating the cutting edges of said elements flush with the surface of the skin. It will be noted that in the Winans razor the cutting elements on the movable cutter are substantially square in transverse cross-section, and are so designed that the cutting edges of same are located some distance away from the skin. Still another distinction between my improved razor and the razor of the Winans patent is that my razor is provided with a clamping member or retaining member F for the movable cutter that laps over the same, and which performs the additional function of reducing the surface area of the reciprocating or removable part of the razor that bears upon the skin, this being advantageous in that less power is required to actuate the movable cutter because only the parts 5 of the movable cutter contact with the skin.

The term "bevel-edged" or "inclined-edge" as herein used, is intended to refer to the cross-sectional shape of the cutting blades and not to the shape or outline of said blades which, in the preferred form of my invention, are substantially pointed so as to cause the cutting edges of same to be disposed at an angle to the cutting teeth of the stationary cutter.

The width of the slots in the stationary cutter may vary, but I have found that if said slots are from approximately .004 to .010 of an inch in width, that the razor will operate satisfactorily.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A razor of the dry shaver type, comprising a handle portion, a member on said handle that constitutes a stationary cutter having a slotted portion, said member having parts that coact with the terminal end of said handle portion to form a collection chamber arranged directly underneath the slotted portion of the stationary cutter, and a movable cutter arranged in superimposed relationship with said stationary cutter.

2. A razor of the kind described in claim 1, provided with a clamping member arranged in overlapping relationship with the movable cutter and provided with parts that constitute the end walls of said collection chamber.

3. A razor of the kind described in claim 1, comprising a clamping member arranged in overlapping relationship with the movable cutter and provided with a means that holds the movable cutter in yielding engagement with the stationary cutter.

4. A razor of the dry shaver type, comprising a handle, a stationary cutter mounted on said handle and provided with two spaced slotted portions that constitute stationary cutting teeth, a movable cutter provided with two groups of spaced cutting teeth arranged in overlapping relationship with said stationary cutting teeth and adapted to simultaneously bear against and exert pressure on the skin during the shaving operation, a retaining means for holding said cutting teeth in yielding engagement with said stationary cutting teeth and provided with a stationary skin-contacting portion disposed between the groups of cutting teeth on the movable cutter, and chambers arranged under the slotted portions of the stationary cutter for receiving the

hairs or whiskers removed from the skin during the shaving operation.

5. A razor of the dry shaver type, comprising a stationary cutter provided with two groups of cutting blades arranged in spaced relationship, a movable top cutter arranged above said stationary cutter and provided with two groups of spaced cutting blades whose top surfaces lie in substantially the same horizontal plane, thereby causing the hair on the skin to be severed by the simultaneous co-action of the groups of cutting blades of the movable and stationary cutters, the cutting blades of the top cutter being connected by a portion of said top cutter disposed in a horizontal plane below the top surfaces of said cutting blades, and a retaining member for said movable top cutter arranged in overlapping relationship with the same and disposed entirely in the space between the two groups of cutting blades of said movable top cutter.

6. A razor of the kind described in claim 5, in which the said retaining member is provided with a stationary skin contacting portion that lies in substantially the same horizontal plane as the skin contacting surfaces of the cutting blades of the movable top cutter.

LOYD SCRUGGS.