April 9, 1940. H. W. SHRYOCK 2,196,599

ROTARY ELECTRIC SHAVER

Filed July 15, 1938

FIG. 1

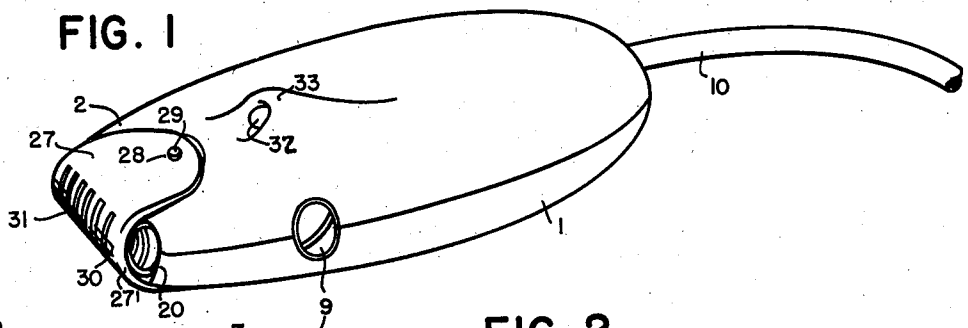
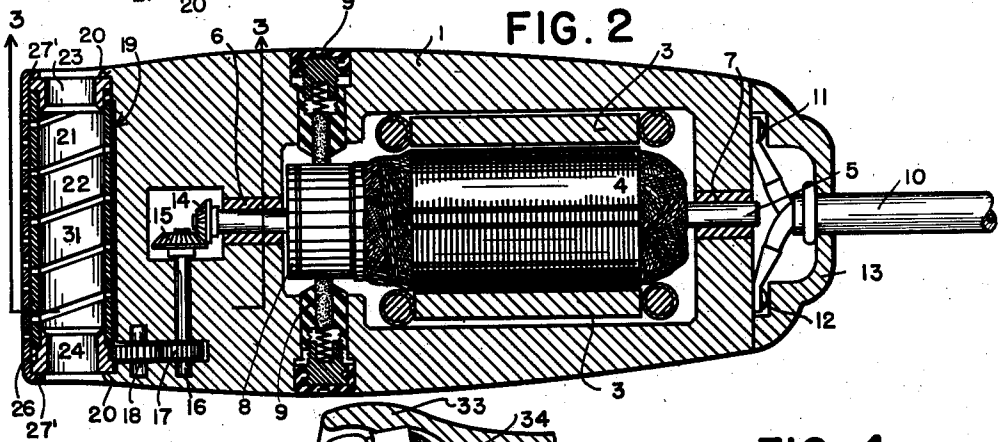


FIG. 2



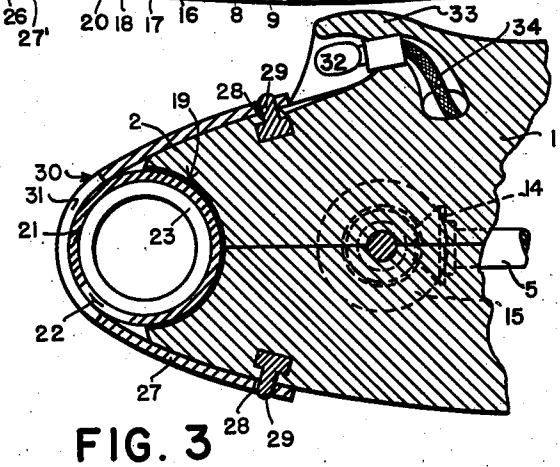


FIG. 3

FIG. 4

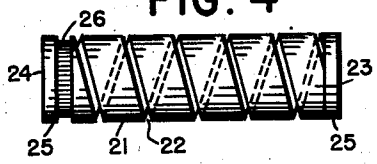
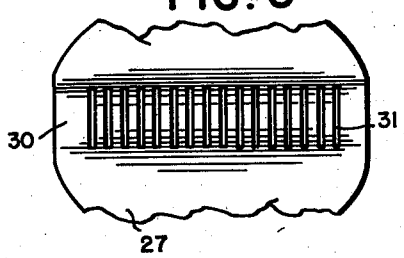


FIG. 5



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ROTARY ELECTRIC SHAVER

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2 Claims. (Cl. 30—43)

My present invention relates to an improved rotary electric shaver or hand controlled shaving implement of the motor-operated type that is used for shaving purposes. The primary object of the invention is the provision of a shaving implement or instrument of this character which is simple in construction and composed of a minimum number of parts thereby insuring facility in the manufacture of the instrument; and this simplicity in construction also eliminates difficulties and annoyance usually encountered in complicated shaving instruments, and at the same time it assures convenience in dismantling the cutting portion of the instrument for cleansing purposes.

The simplified working parts of the instrument include a detachable face plate having a guard provided with shearing slots, with which the detachable rotary cutter co-acts; and the rotary cutter is fashioned with a spiral or longitudinally curved groove having a continuous shearing edge that co-operates with the shearing edges of the grooves in the guard portion of the face plate to clip or nip the hairs.

Means are provided in the form of a receptacle for collecting the material or shavings, and means are provided whereby the collected debris may with facility be expelled or withdrawn from the receptacle. An auxiliary lamp is also mounted on the implement or instrument for illuminating purposes during the operation of shaving.

The invention consists essentially in certain novel combinations and arrangements of parts in the motor-operated instrument that involve a head having a recess and a detachable slotted face-plate closing the recess and forming a working chamber for a tubular or hollow rotary cutter having a continuous shearing edge for co-action with the slotted face plate, as will hereinafter be more fully set forth and claimed.

In the accompanying drawing I have illustrated one complete example of the physical embodiment of my invention wherein the parts are combined and arranged according to the best mode I have thus far devised for the practical application of the principles of my invention.

Figure 1 is a perspective view of the instrument embodying my invention.

Figure 2 is a longitudinal sectional view of the instrument, showing the operating motor, the transmission gearing, and the rotary cutter and accessories.

Figure 3 is an enlarged detail sectional view on line 3—3 of Figure 2, at the front or head of the instrument showing the tubular or hollow rotary cutter and the face plate or guard, together with the auxiliary lamp.

Figure 4 is an exterior face view of the tubular cutter.

Figure 5 is a face view of the slotted guard-portion of the face plate.

In carrying out my invention I employ a body of suitable shape, size, and material adapted to be held in the hand, and manipulated for shaving purposes, and this body comprises a motor casing 1 and the front portion or head 2 of the body within the motor casing is mounted the electric-motor including the stationary field or windings 3 and the rotary armature 4 having its shaft 5 journaled in spaced and alined bearings 6 and 7 centrally mounted in the body of the instrument. The communtator ring 8 and brushes 9 are located at the front of the motor, and the cable 10 is connected at terminals 11 and 12 within a housing 13 at the rear of the instrument, the proper connections from the terminals being made to the operating parts of the motor.

The power transmission gearing from the motor is operated through the shaft 5 which is equipped with a bevel pinion 14 which meshes with a complementary bevel pinion 15 on the angularly disposed countershaft 16 that is journaled transversely of the motor in the head portion 2 of the instrument. The countershaft 16 has mounted thereon an operating pinion 17 that meshes with an idler 18 for transmission of power to the rotary cutter as will be described.

The head 2 of the instrument is fashioned with a semi-circular mouth or recess 19 that extends transversely of the longitudinal axis of the motor, and the semi-circular wall of this recess terminates in a pair of lateral, spaced end-lips or flanges 20, 20 which assist in retaining the rotary cutter against longitudinal displacement.

The rotary cutter 21, which is mounted in the recess at the front of the head, as best seen in Figure 4 is a tubular cylinder that is fashioned with a single spiral groove, or longitudinally curved groove 22, extending from end to end of the tube or cylinder, and the tubular cutter is fashioned in suitable manner from high-grade sheet steel that is hard and also resilient.

In the open ends of the tubular cutter are mounted and fixed heads 23 and 24, each having bearing flanges or rings 25, and one of these heads, as 24 is fashioned with an exterior gear ring 26 with which the ilder 18 of the transmission gearing meshes.

The single spiral groove 22 of the rotary cutter permits a slight longitudinal compression of the

tubular cutter so that may be inserted in the recess of the head between the two lips 20, 20, and the walls of the groove have sharp shearing edges which co-act with complementary shearing edges of the detachable shearing plate or face plate 27, which together with the recess in the head form the working chamber for the rotary cutter.

The detachable face plate 27, which is of general U-shape in cross section, is also fashioned of high-grade hard and resilient steel that permits spreading of the two wings of the plate in order that they may be snapped over the head of the instrument to form the working chamber and to retain the rotary cutter in its chamber. This face plate also has end lips or flanges 27' that are opposed to the end lips or flanges 20 of the recessed head, and the two sets of lips 20—27' at opposite ends of the working chamber co-operate with the annular heads or flanges 25 of the cutter to retain its parts in working position, and to provide the bearings for the rotary cutter.

For ready attachment and detachment, the face plate is fashioned with two opposed pin-holes 28, and for complementary use with these holes, the head 2 of the instrument is provided with two oppositely projecting, exterior pins 29 that slip into the holes when the face plate is slightly spread so that the holes may be slipped over the pins, and in this manner the face-plate is held in rigid position in front of the recess of the instrument head. By first lifting the top wing of the face-plate in Figure 3, to release it from the pin 29, the plate will thereby be loosened so that the lower wing may be detached from its pin, and the resiliency or elasticity that permits this detachment afterward restores the face plate to its normal shape.

At the bend 30 of the U-shaped face-plate a guard is formed that conforms to the shape of the tubular cylindrical cutter, and the latter rotates, under power from the motor, in close frictional contact with the inner face of the guard. As best seen in Figure 5 the guard portion 30 of the face-plate is fashioned with a series of spaced slots 31 that extend transversely of the curve of the guard and therefore transversely of the axial plane or longitudinal axis of the rotary cutter. These slots 31 have sharp edges to their walls similar to the sharp edges of the wall of the spiral or curved wall in the rotary tubular cutter, and the cutter rotates in such manner that its shearing wall passes the shearing walls or edges of the face plate or guard at an angle that will result in a shearing cut of the hairs of a beard.

The slotted guard-portion of the face-plate is used to massage the bearded face and the hairs of the beard are thus caused to project through the slots 31 of the guard, into position so that they may be nipped by the rotary cutter, due to the action of the spiral or longitudinally curved cutting edge of the latter.

The shavings or debris from the cutting edges is passed to the interior of the tubular, open-end rotary cutter, and should any of the debris collect within the cutter, this residue may be blown, as by the breath, from the interior of the cutter, or a cylindrical brush of proper size may be passed back and forth through the tubular cutter to dislodge the hairs and brush them from the interior of the cutter. For a more thorough cleansing of the instrument, the face plate may be detached from the recessed head, and the slotted guard portion cleaned with a brush. The rotary cutter may also be dropped out of the recessed-head and its slot or groove cleansed with a brush, and the semi-circular wall of the recess 19 should also be kept clean, to insure a free rotation of the rotary cutter after it has been restored to working position and the face plate has been replaced.

As an auxiliary feature of the shaver I employ an electric illuminating lamp 32 mounted in a hood 33 in the upper face of the head 2, just back of the face-plate, so that the lamp may illumine the face of the person using the instrument while shaving. The lamp, by a suitable connection at 34, receives current from the same source of supply as the electric motor which operates the rotary cutter.

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

1. In a motor-operated shaving instrument, the combination with a semi-cylindrical recessed head having an edge retaining flange at each end, oppositely projecting pins on its upper and lower faces, a face plate having spaced ends and perforated to engage said pins, said face plate comprising a curved slotted front forming with the recessed head a cylindrical working chamber, and said slotted front portion also having edge retaining flanges at its ends, of a rotary cutter mounted in the working chamber between the head-flanges and the flanges of the slotted front portion of the face plate.

2. In a motor operated shaving instrument, the combination with a semi-cylindrical recessed head having an end retaining flange at each end, a face-plate and detachable means for fastening the ends of the face plate to the upper and lower faces of the head, and said face plate having a front slotted guard portion forming with the recessed head a cylindrical working chamber, of a spirally slotted open end rotary cutter mounted in the working chamber, a rigid open center bearing head at each end of the cutter, each said bearing head having an outer annular flange at its outer edge, inner retaining flanges at the opposite ends of the slotted guard, said head retaining-flanges and guard retaining-flanges engaging the outer flanged ends of the bearing heads, and one of said bearing heads having a driven member thereon.

HARRY W. SHRYOCK.