

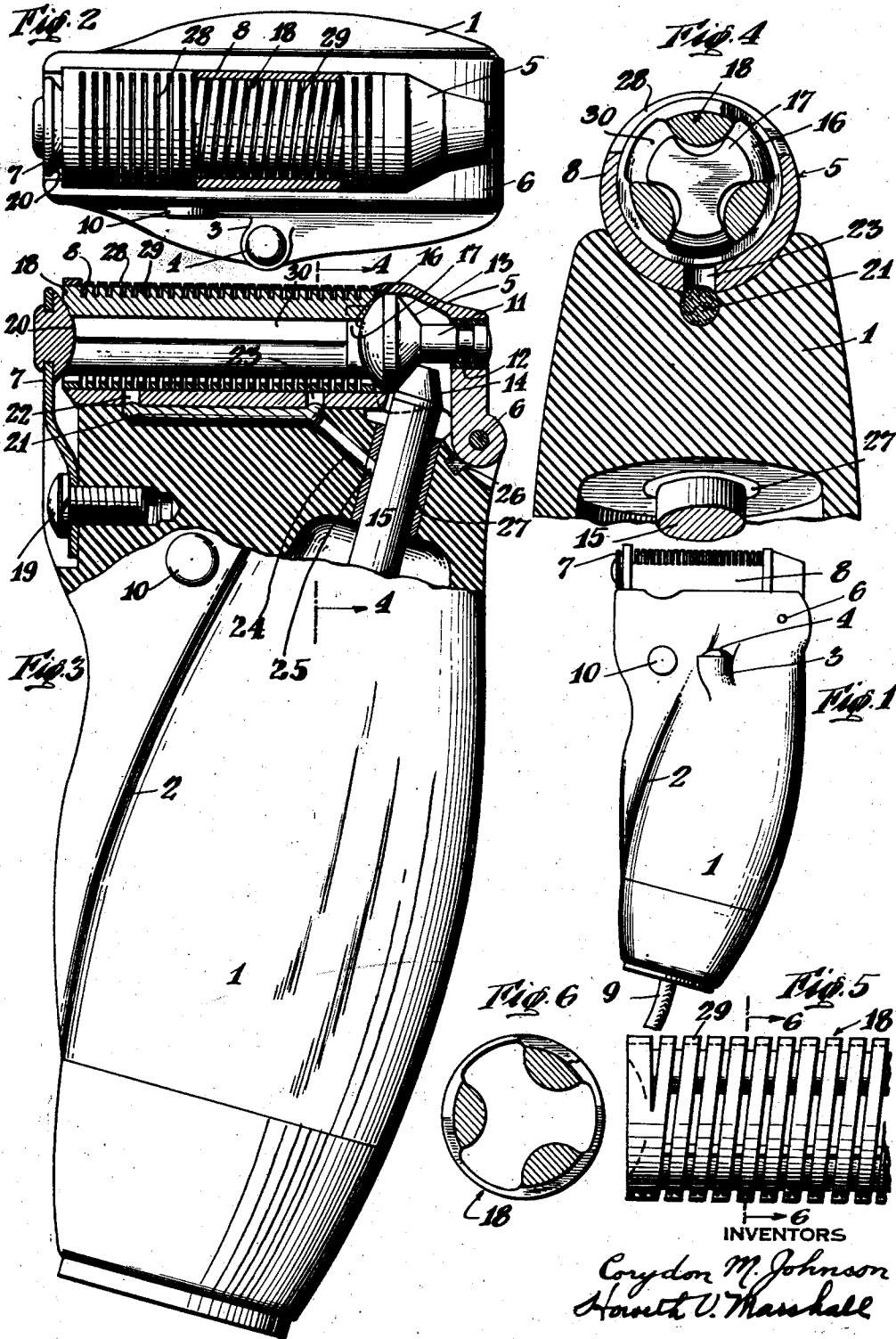
Jan. 20, 1942.

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2,270,800

RAZOR

Filed Jan. 15, 1938



## UNITED STATES PATENT OFFICE

2,270,800

RAZOR

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Application January 15, 1938, Serial No. 185,203

5 Claims. (Cl. 30-43)

This invention relates in general to cutlery devices and more particularly to motor driven devices employing a rotor and a stator cutter cooperating with each other for shearing purposes.

While the fundamentals of the invention about to be described are adaptable in many types of cutlery devices, such as lawn mowers, sheet metal profilers, mowing machines, harvesters, textile shearers and the like, the same for purposes of illustration, will be described in particularity as applied to an electric motor operated razor.

Among the improvements and differentiating characteristics of the particular razor are the provision of a hinged cutter head to receive a hollow removable stator cutter and an interchangeable and reversible full rotating rotor cutter with spiral blades and a lighting means carried by the compact casing and adapted to be lighted by the same electrical source that drives the electric motor for operating the rotor cutter.

The details of the invention will become more apparent from the following specification and appended claims, certain embodiments thereof being illustrated in the accompanying drawing, in which:

Figure 1 is a view in side elevation of the electric motor driven razor, showing an illuminating lamp lighted.

Figure 2 is a top plan view of the same partly broken away.

Figure 3 is an enlarged view in side elevation, of the same, partly in longitudinal section to show the motor driven rotor cutter and its relationship with the stator cutter, together with the hinged cutter head and mounting and clamping means therefor.

Figure 4 is a fragmentary view in section taken along line 4-4 of Figure 3.

Figure 5 is a fragmentary broken away view in side elevation of the rotor cutter showing its spiral cutting edge.

Figure 6 is a view in cross section of the rotor cutter taken along line 6-6 of Figure 5.

Referring more particularly to the drawing, the housing shown in Figs. 1 and 3 is made in convenient hand grip form, particularly by the bowed inclined under surface 2. On either side of the housing is a lamp casing 3 to receive a lamp 4 to provide a shadow eliminating light so as to provide a means for illuminating the surface to be shaven. The cutter head 5 is of the hinged type, the same being hinged at 6 and provided with a spring clamp 7. The outer stator cutter is shown at 8. The lead wires 9 extend

into the razor, which is provided with any suitable electrically driven motor, and which may be plugged into a suitable socket from which to obtain electric power. A suitable switch 10 may be used for starting or stopping the motor and for lighting and turning off the lights, or separate switches may be employed for the lamps and motor.

As shown in one modification in Fig. 3 the razor is in assembled position. Within the head 5 is rotatably mounted a pilot shaft 11 which is maintained in position by a suitable retainer pin 12. The pilot shaft includes a bevelled drive face 13 which cooperates with a corresponding bevelled tip 14 of the electric motor shaft 15 so as to be rotated thereby. The pilot shaft also has a rotatable self-centering ball end 16 and driving arms 17 fitting within grooves in the rotor cutter 18 for rotating the rotor cutter.

One end of the head is provided with an adjustable spring 7 secured at one end by a set screw 19, the spring carrying at its other end a rotatable self-centering semispherical bearing 20, adapted to fit within a depression in the body of the rotor cutter 18. Thus with the switch 10 turned on the rotor cutter 18 is rotated within and in close and predetermined relation to the outer stator cutter 8.

The rotor cutter is removable, interchangeable and reversible, by merely hinging outwardly the stator cutter which automatically presses downwardly on the spring 7 until the ball 20 clears the depression in the rotor cutter, until the head is swung about the hinge 6. Then the rotor may be removed, replaced, changed or reversed and the head then reassembled. For lubricating purposes there is an oiling wick 21, with oil ducts 22 and 23 leading to the rotor cutter and a felt seal 26 and oil ducts 24 and 25 leading to the motor shaft 15 rotating within its sleeve 27.

As stated before, the cylindrical rotor and stator cutters are hollow. The stator cutter 8 is slotted at 28. The fully rotating rotor cutter has a cutting edge comprising one or more spiral threads 29. The spiral threads approach and pass the cutting edge of the stator cutter 8 at a critical shearing angle at all times in one or more points along the shearing area of the stator cutter. The arrangement of the parts is such that it provides for the maintenance of a small predetermined clearance between the spiral rotor cutter and the stator cutter so as to maintain maximum shearing efficiency.

The cylindrical stator cutter is hollowed out on an axis parallel with the axis of the inside

circumference but on an axis offset from that of the outside circumference, the diameter of the boring being less than the diameter of the outside circumference. The diameter and the location of the boring is such as to produce a hollow cylinder with a wall on the order of three and one-half thousandths of an inch thick at the thinnest point or suitable thickness. The eccentrically hollowed cylindrical stator cutter slotted at right angles or other suitable angle to the longitudinal axes and slotted down to a suitable depth from the outer surface of the stator cutter on the diameter of and at right angles to the diameter bisecting both axes.

From the foregoing it will be seen that there has been provided a compact self-contained electric motor driven shearing device which: carries its own illumination; has removable and replaceable stator cutters; removable, interchangeable and reversible rotor cutters; a hinged head with spring clamping means; self-centering bearings for the cutters to prevent misalignment and to allow the same to be floating to reduce wear and noise; a full rotating rotor cutter with predetermined spiral cutting edges to effect efficient shearing and a reservoir 30 for the matter sheared.

**We claim:**

1. In a shearing device employing a hollow stator cutter and a hollow rotor cutter therein, a shaft for driving said rotor cutter, said device comprising a hinged head in which said rotor cutter is removably mounted, said hinged head including a hinge disposed at right angles to the axes of said cutters by which said head may be swung into and out of operative position and said rotor into and out of driven relationship with said driving shaft.

2. In a shearing device employing a hollow stator cutter and a hollow rotor cutter removably mounted therein, a shaft for driving said rotor cutter, said device comprising a hinged head including said stator cutter and a hinge disposed at right angles to the axes of said cutters by

which said head may be swung into and out of operative position and said rotor cutter into and out of driven relationship with said driving shaft.

3. In a shearing device employing a hollow stator cutter and a hollow rotor cutter removably mounted therein, a shaft for driving said rotor cutter, said device comprising a hinged head including said stator cutter and a hinge disposed at right angles to the axes of said cutters by which said head may be swung into and out of operative position and said rotor cutter into and out of driven relationship with said driving shaft and adjustable self-centering means for maintaining said cutters in predetermined aligned position.

4. In a shearing device employing a hollow stator cutter and a hollow rotor cutter removably mounted therein, a shaft for driving said rotor cutter, said device comprising a hinged head including said stator cutter and a hinge disposed at right angles to the axes of said cutters by which said head may be swung into and out of operative position and said rotor cutter into and out of driven relationship with said driving shaft and resiliently urged adjustable self-centering means for maintaining said cutters in predetermined aligned position.

5. In a shearing device employing a hollow stator cutter and a hollow rotor cutter removably mounted therein, a shaft for driving said rotor cutter, said device comprising a hinged head including said stator cutter and a hinge disposed at right angles to the axes of said cutters by which said head may be swung into and out of operative position and said rotor cutter into and out of driven relationship with said driving shaft and self-centering hemispherical bearing means, one of which is resiliently urged by adjustable resilient means for maintaining said cutters in predetermined aligned position.

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