Aug. 14, 1951 P. O. SMITH 2,564,379

ELECTRIC RAZOR

Filed May 7, 1947

Fig. 1

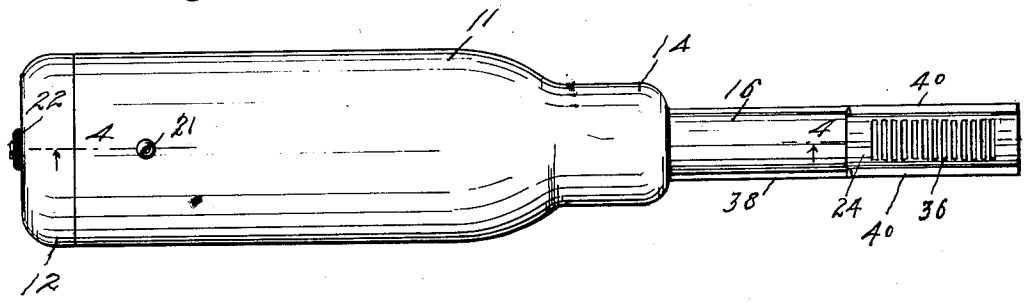


Fig. 2

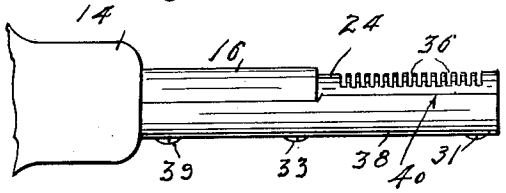


Fig. 3

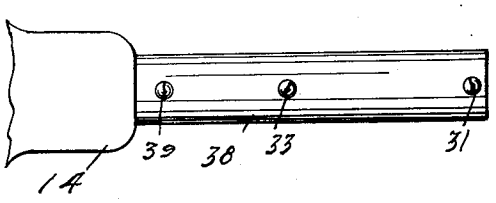


Fig. 4

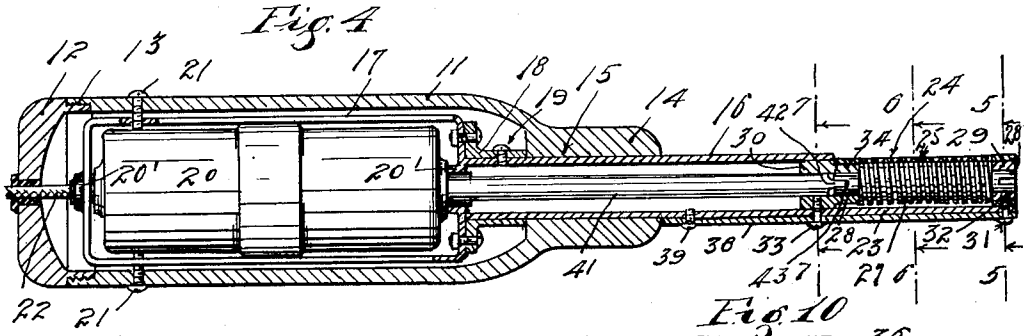


Fig. 10

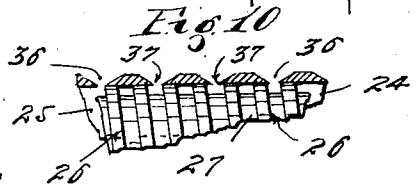


Fig. 5

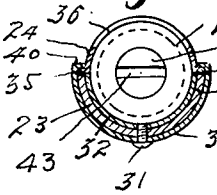


Fig. 7

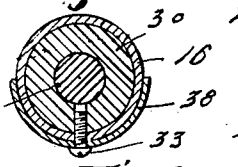


Fig. 8

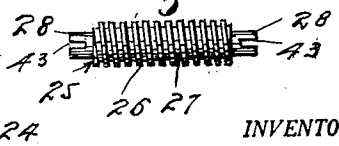


Fig. 6

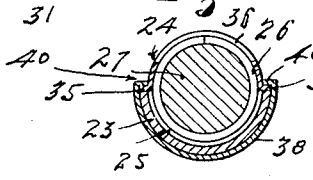
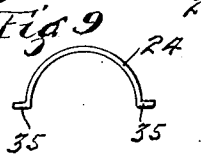


Fig. 9



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ELECTRIC RAZOR

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4 Claims. (Cl. 30—43)

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My present invention relates to improvements in electric razors and, more particularly, to the rotary cutter type.

The object of this invention is to provide an extremely simple and highly efficient electric razor having relatively few parts and in which the cutting parts thereof are readily removable and replaceable for the purpose of cleansing or the substitution of new parts for dull parts.

To the above end, the invention consists of the novel devices and combination of devices hereinafter described and defined in the claims.

In the accompanying drawing, which illustrates the invention, like characters indicate like parts throughout the several views.

Referring to the drawing:

Fig. 1 is a top plan view of the improved razor;

Fig. 2 is a side elevational view of the razor with a portion of its handle broken away;

Fig. 3 is a bottom plan view of the razor as shown in Fig. 2;

Fig. 4 is a view partly in elevation and partly in longitudinal central section taken on the line 4—4 of Fig. 1;

Fig. 5 is a view partly in end elevation and partly in section taken on the line 5—5 of Fig. 4, on an enlarged scale;

Figs. 6 and 7 are sectional views taken on the lines 6—6 and 7—7 of Fig. 4, respectively, on the same scale as Fig. 5;

Fig. 8 is an elevational view of the cutter removed from the razor;

Fig. 9 is an end elevation of the blade; and

Fig. 10 is a fragmentary detail view of the cutter and blade in operative relation.

This electric razor has a cylindrical handle 11 having therein a cylindrical motor compartment that extends through the outer end of said handle to afford access thereto. The open outer end of the handle 11 is normally closed by a cap 12 attached thereto by a screw-thread 13. The inner end portion 14 of the handle 11 is contracted and has therein an axial bore 15 that leads from the motor compartment.

A tubular shank 16 extends completely through the bore 15 and is snugly fitted therein. Within the motor compartment is a rectangular motor frame 17 having a collar 18 on its inner end and into which the adjacent end portion of the shank 16 is telescoped and detachably secured thereto by a screw 19. An electric motor 20 is mounted in the frame 17 by means of bearings 20'. The motor frame 17 and the motor 20, at their outer end portions, are detachably secured to the handle 11 by screws 21. Circuit wires 22 for the motor 20 extend through an insulated hole in the cap 12 at the center thereof.

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The shank 16, at its outer end portion, is reduced to semi-cylindrical form to afford a trough-like support 23 for a semi-cylindrical blade 24. This support 23 and blade 24 form a complete cylinder that affords a housing for a rotary cutter 25. The rotary cutter 25 has a pair of twin spiral cutting edges 26 on a cylindrical body 27. These cutting edges 26 are formed by a square screw-thread. On the ends of the cutter body 27 is a pair of trunnions 28 journaled in front and rear cylindrical bearings 29 and 30, respectively. The front bearing 29 is mounted in the outer end portion of the blade support 23 and detachably secured thereto by a screw 31. The diameter of the bearing 29 is slightly less than the internal diameter of the blade support 23 and to bring the same into axial alignment with the shank 16, a semi-cylindrical shim 32 is interposed between the blade support 23 and the bearing 29 and held by the screw 31. The rear bearing 30 is tightly fitted in the outer end portion of the shank 16 and has an extension 34 of reduced diameter, that extends into the blade support 23.

The bearing 29 and the bearing extension 34, support the blade 24, in part, at its end portions. This blade 24 is further supported by outturned flanges 35, on its longitudinal edges, that slidably rest on the longitudinal edges of the blade support 23. The blade 24 has therein a multiplicity of edgewise spaced hair passageways or slots 36 that extend transversely of said blade. Both longitudinal edge portions of the blade 24, at each slot 36, are ground to sharp shearing edges 37. The rotary cutter 25 is endwise reversible and supported with its spiral cutting edges 26 in close cutting action with the shearing edges 37.

A keeper 38 is provided for removably holding the blade 24 with its flanges 35 slidably resting on the blade support 23. The keeper 38 is semi-cylindrical, nested on the blade support 23 and is detachably secured thereto by the screw 31 and screws 39. On the longitudinal edges of the keeper 38 are inturned flanges 40 that overlie the blade flanges 35. The upper edge of the blade support 23 and the overlying keeper flanges 40 form therebetween a pair of opposing channels in which the blade flanges 35 are slidably held. This mounting of the blade 24 permits ready endwise removal of the same from its support 23 by sliding movement. The keeper 38 and its flanges 40 are spring metal and have a slight downward pull on the flanges 35 that frictionally holds said blade in position on the support 23.

The cutter **25** is rotated directly from the motor **20** by its armature shaft **41** which extends axially through the shank **16** and is journaled in the bearing **30**. On the outer end of the shaft **41** is a bit **42** that extends into one of the slots **43** in the trunnions **28**, depending on which way the cutter **25** is endwise turned. Obviously, the bit **42** and either one of the trunnions **28** and the slot **43** therein afford a separable coupling by which the rotary cutter **25** may be detached from the shaft **41** by endwise movement. To remove the rotary cutter **25** from the razor, it is only necessary to remove the bearing **29** and draw said cutter outwardly.

The entire razor assembly may be removed from the handle **11** simply by removing the keeper **38** and pulling said assembly from the handle **11** through the open end thereof.

From what has been said, it will be understood that the electric razor described is capable of modifications as to details of construction and arrangement within the scope of the invention herein disclosed and claimed.

What I claim is:

1. A handle having in one end portion a compartment, an axial bore in its other end portion, a frame in the compartment having a cylindrical shank extending outwardly through the bore and also having a stop shoulder engaging the handle at the bore, an electric motor in the frame with its armature shaft through the shank, said shank having on its outer end a support that forms an extension thereof and is semi-circular in cross-section, a semi-circular blade loosely resting on the support, said support and the blade forming a complete cylindrical housing, means releasably securing the blade to the support, the internal diameter of the blade being slightly less than the internal diameter of the support, a cylindrical cutter in the housing connected to the armature shaft and cooperating with the blade, and a bearing in each end of the housing in which the cutter is journaled.

2. The structure defined in claim 1, further including a substantially semi-circular shim interposed between the outer bearing and the support.

3. The structure defined in claim 1 in which the means releasably securing the blade to the support includes out-turned flanges on the longitudinal edges of the blade and a substantially semi-cylindrical keeper in which the shank and the support are fitted, said keeper having in-turned flanges overlapping the flanges on the blade, said keeper engaging the handle as a stop, and means releasably securing the keeper to the shank and the support, said frame, shank, motor, armature shaft, support, blade and cutter affording a self-contained unit that is removable through the handle when the keeper is removed.

4. A handle having in one end portion a compartment, an axial bore in its other end portion, a frame in the compartment having a tubular shank extending outwardly through the bore, an electric motor in the frame with its armature shaft extending through the shank, cutting mechanism on the free end portion of the shank including a cutter attached to said shaft, and a displaceable keeper on the shank engaging the respective end of the handle, said frame, shank, motor and cutting mechanism, affording a self-contained unit, removable from the handle through its opposite end from the bore when the keeper is removed from the shank.

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