

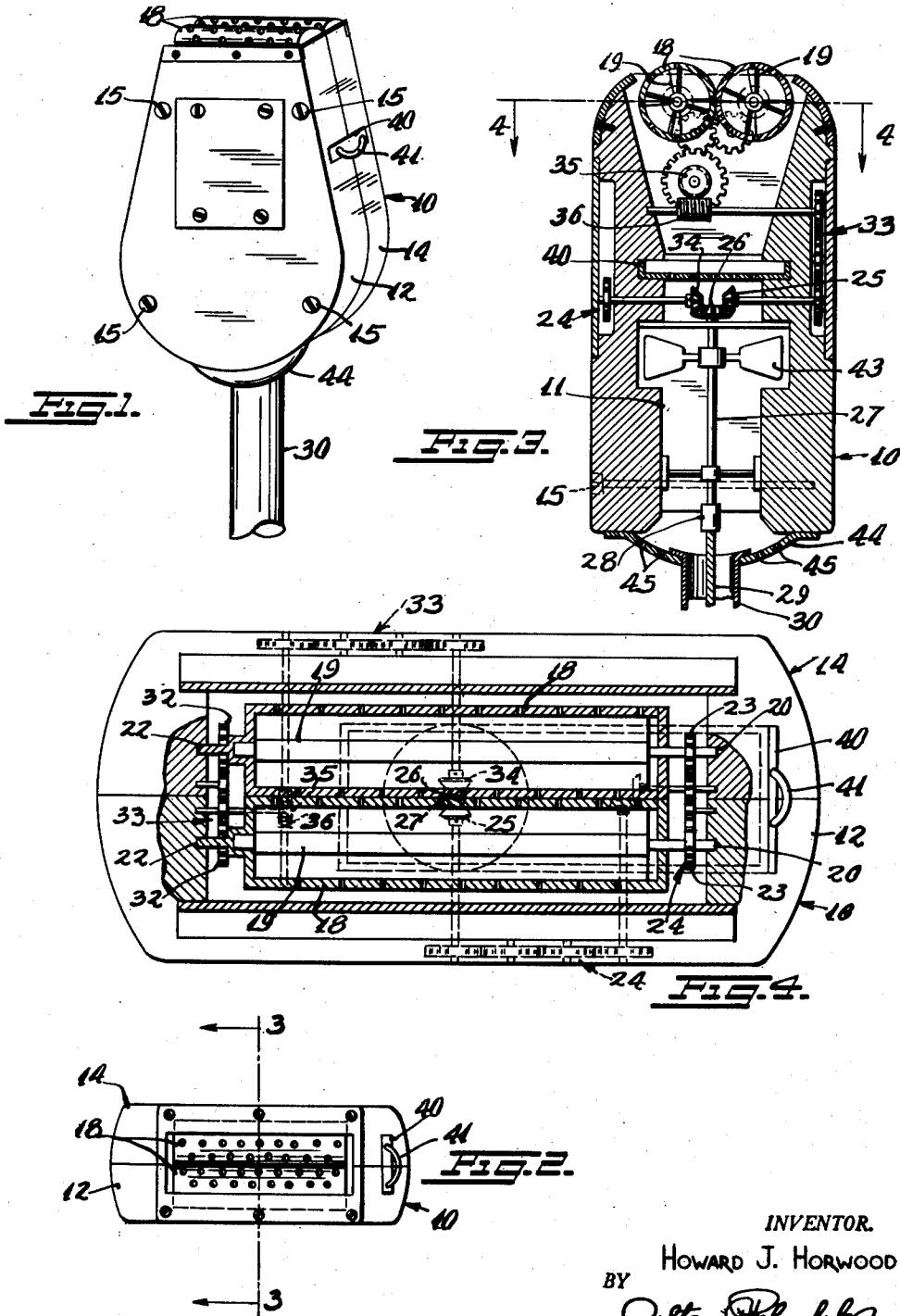
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DRY SHAVER

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## DRY SHAVER

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3 Claims. (Cl. 30-43)

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This invention relates to new and useful improvements in an electric shaver. More particularly, the invention proposes an improved electric shaver which is characterized by a pair of hollow cylindrical perforated hair cutting and skin spreading massaging rollers which work in conjunction with internal hair cutters to cut the hair while the skin is being spread and massaged.

The invention proposes that the hair cutting and skin spreading massaging rollers be rotated relatively slowly so as to spread and massage the skin at an effective rate. It is proposed that the hair cutters working inside of the rollers operate relatively rapidly so as to efficiently cut the hair.

Still further the invention contemplates that the skin spreading massaging rollers be rotated in opposite direction while each of the internal hair cutters be rotated in a direction opposite to its respective roller. With this construction and arrangement the electric shaver is exceptionally effective.

Another improved feature of the electric shaver resides in the fact that the housing of the shaver is provided with an air duct which extends from the top to the bottom, and a hair collecting filter is removably mounted across said air duct and beneath said hair cutters so as to collect and hold the hair when cut.

Still further the invention proposes the provision of a fan for creating an air draft through the housing of the electric shaver so as to more effectively cause the hair to engage upon and be collected by the collecting filter.

The invention contemplates provision of driving means for operating the shaver through a preferred form disclosed in this specification, is one in the nature of a flexible shaft which may be connected with any source of rotation, such as an electric motor, or other type of motor.

Still further the invention proposes the construction of an electric shaver, as briefly described which is simple in construction, efficient in operation and which may be manufactured and sold at a reasonable cost.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

Fig. 1 is a perspective view of an electric shaver embodying this invention.

Fig. 2 is an enlarged plan view of Fig. 1.

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Fig. 3 is a vertical sectional view taken on the line 3-3 of Fig. 2.

Fig. 4 is an enlarged horizontal sectional view taken on the line 4-4 of Fig. 3.

The electric shaver, in accordance with this invention, includes a housing 10 having an air duct 11 extending from the top to the bottom. Preferably the housing 10 is formed from more than one section, as for example, the sections 12 and 14 which are rigidly connected together by fastening screws 15. It is proposed that the housing 10 be of a size so as to be capable of conveniently being engaged in one's hand which will permit the electric shaver to be conveniently manipulated across one's face, or other skin surface to be shaved.

A pair of hollow cylindrical perforated hair cutting and skin spreading massaging rollers 18 are rotatively mounted across the top portion of the air duct 11. Hair cutters 19 are mounted within the rollers 18. These hair cutters 19 may be of any design. However, they are illustrated as a rotating type of hair cutter. The hair cutters 19 are rotatively mounted inside of the rollers 18 and have shafts 20 extending from one of the ends of the rollers 18. The rollers 18 are also provided with stud shafts 22 extending from their other ends.

The hair cutters 19 are associated with drive means which includes small gears 23 mounted upon the shafts 20 and connect with a gear train 24 which terminates in a small bevel gear 25 meshing with a bevel gear 26 upon a shaft 27 rotatively supported coaxially through the air duct 11. This shaft 27 is connected by a coupling 28 with a flexible shaft 29 passing through a flexible tube 30. It is proposed that the flexible shaft 29 be connected with some driving mechanism, not illustrated on the drawing. This driving mechanism can be an electric motor, or a motor of another type.

The hair cutting and skin spreading massaging rollers 18 are associated with drive means for slowly rotating them in a direction away from each other. This drive means includes small gears 32 mounted upon the stud shafts 22 and connected with a gear train 33 which terminates in a small bevel gear 34 meshing with the small bevel gear 26 on the drive shaft 27. However, in order to drive the hair cutting and skin spreading massaging rollers 18 at a slow rate of speed, the gear train 33 includes a worm gear 35 and worm pinion 36. The transmission 24 is of a much higher ratio so that the hair cutters 19 rotate at a relatively rapid speed. Moreover, the

gear trains 24 and 33 are so related to each other that the hair cutters 19 will rotate towards each other, and thus in the opposite direction to the direction of rotation of the rollers 18, which is away from each other.

Collecting filter 40 is removably mounted within said housing 10 and across said air duct 11. This filter 40 is in the nature of a drawer, but it is made from filtering material. The filter 40 projects from one side of the housing 10. This projecting side is provided with a handle 41 by which it may be conveniently gripped and thus removed for cleansing, and replaced whenever desired.

Means for driving air down through the duct 11 is associated with said duct, and includes a fan 43 mounted upon the shaft 27 and extending across the duct 11. A bottom cap plate 44 is mounted upon the bottom of the housing 10 and is formed with vent openings 45 through which air may escape.

The operation of the device is as follows:

The electric shaver is used identically the same way as present day electric shavers are used. However, when the front end of the shaver is engaged against the skin to be shaved the hair cutting and skin spreading massaging rollers 18 will spread and massage the skin because they are rotating away from each other. The hair will project through the perforations in the rollers 18. Some of this hair will be on portions of the skin being spread, and this will assist in rigidly holding the skin so that the hair stands erect and is easily cut. The hair cutters 19 revolving within the rollers 18 will cut the hair which projects through the perforations of the rollers 18. The fan 43 will cause a down draft through the duct 11 and the small pieces of cut hair will find their way along the air stream and will be caught and held by the filter 40. The filter 40 may be removed and cleaned whenever necessary.

The hair cutter and skin spreader massaging rollers 18 are slowly rotated in a direction away from each other by the gears 32, the gear train 33 which terminates in the bevel gear 34, and the driven shaft 27. The hair cutters 19 will be driven by the small gears 23, the gear train 24 which terminates in the small bevel gear 25, and the driven shaft 27.

While I have illustrated and described the preferred embodiments of my invention, it is to be understood that I do not limit myself to the precise constructions herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

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

1. An electric shaver, comprising a housing, a pair of hollow cylindrical perforated hair cutting and skin spreading massaging rollers rotatively mounted thereon adjacent and in contact with each other, hair cutters mounted within said rollers, drive means for said hair cutters, and means for slowly rotating said rollers away from each other, said hair cutters being rotative within said rollers in a direction opposite to the direction of said hair cutting and skin spreading massaging rollers.

2. An electric shaver, comprising a housing, a pair of hollow cylindrical perforated hair cutting, and skin spreading massaging rollers rotatively mounted thereon adjacent and in contact with each other, hair cutters mounted within said rollers, drive means for said hair cutters, and means for slowly rotating said rollers away from each other, said hair cutters being rotative within said rollers, and said drive means rotating said hair cutters at a relatively rapid speed in relation to the rotation of said rollers, said hair cutters being rotative in a direction opposite to the rotation of said hair cutting and skin spreading massaging rollers.

3. An electric shaver, comprising a housing having an open end, an adjacent pair of hollow cylindrical hair cutting and skin spreading rollers rotatively mounted parallel to each other across said open end, said rollers being formed with a plurality of perforations through which the free ends of hairs extend as the rollers pass over a skin surface, hair cutters rotatively mounted within said rollers, means for slowly rotating said rollers in opposite directions, and means for rapidly rotating each of said cutters within its respective roller in a direction opposite to the direction in which its respective roller is rotating for cutting the hairs which extend into said rollers through said perforations.

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