Oct. 22, 1940. A. HENDERSON 2,219,090

POWER OPERATED SAFETY RAZOR

Filed July 20, 1938

FIG. 1

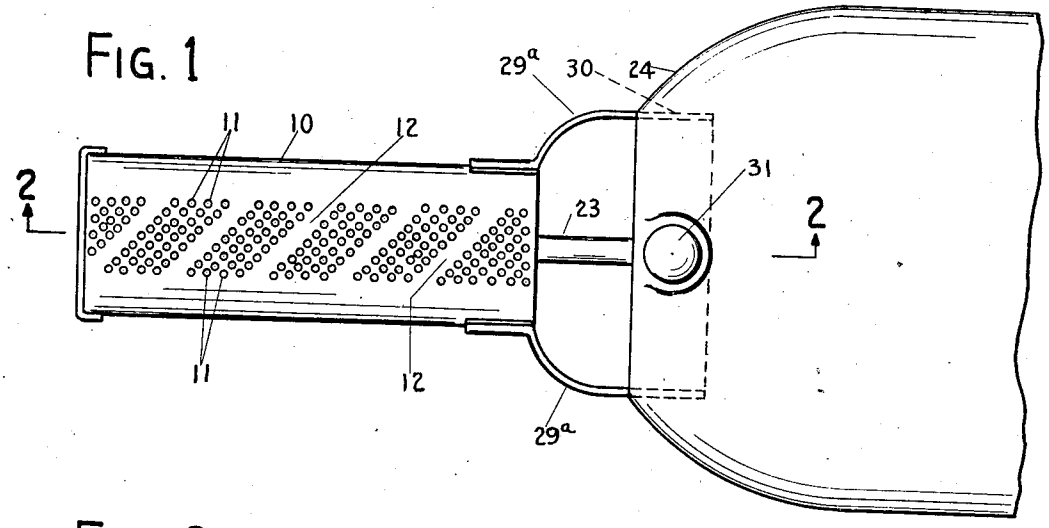


FIG. 2

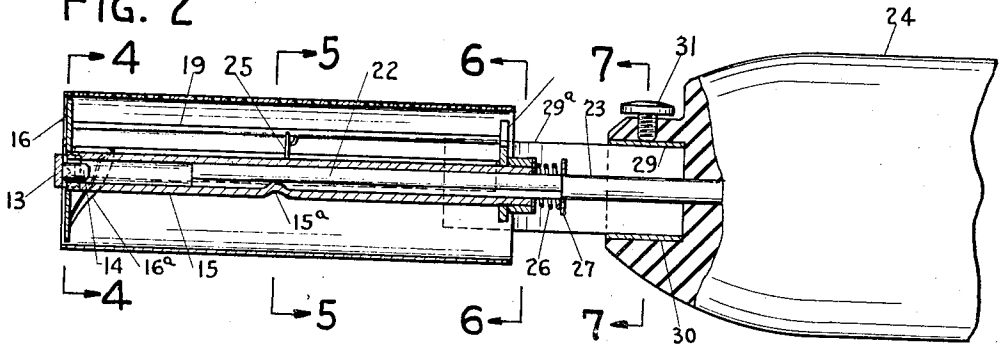


FIG. 3

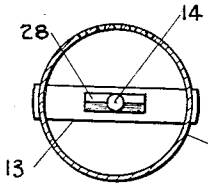


FIG. 4

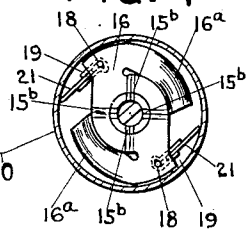


FIG. 5

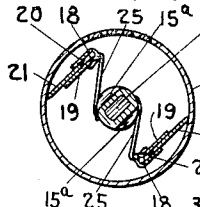
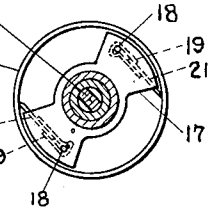


FIG. 6



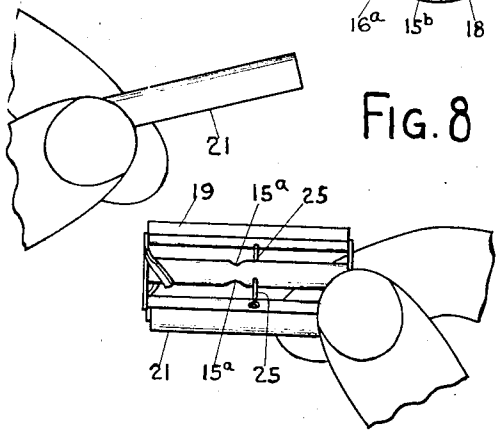


FIG. 8

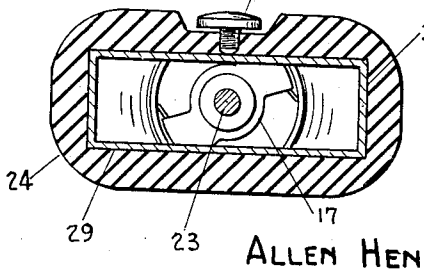


FIG. 7

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POWER-OPERATED SAFETY RAZOR

Allen Henderson, Akron, Ohio

Application July 20, 1938, Serial No. 220,254

4 Claims. (Cl. 30—43)

This invention relates to power-operated safety razors.

The general purpose of the invention is to provide a power-operated safety razor, comprising a head in which is a cutting element, there being an improved cutting action between cutting element and the head.

A further purpose of the invention is to provide in such a razor, a blower for maintaining the cutting head cool and for blowing away the cut hair, as the shaver is being used.

A further object of the invention is to provide in the cutter a removable cutting-edged blade, the cutter head being removable from the razor, so that the cutting element can be withdrawn and the blade changed so that sharp blades can be substituted for dull blades.

The foregoing and other objects of the invention are attained in the shaver illustrated in the accompanying drawing and described below. It is to be understood that the invention is not limited to the specific form thereof shown and described.

Of the accompanying drawing:

Figure 1 is a plan view of a shaver embodying the invention.

Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is an inside end view of the outer end of the cutter head.

Figure 4 is a section on line 4—4 of Figure 2.

Figure 5 is a section on line 5—5 of Figure 2.

Figure 6 is a section on line 6—6 of Figure 2.

Figure 7 is a section on line 7—7 of Figure 2.

Figure 8 is a view showing the cutting element removed and showing how a blade may be removed from the cutting element to be replaced.

Referring to the drawing, the numeral 10 designates a cutting head which is preferably of cylindrical shape and which has therein groups of apertures 11, 11 placed preferably in angular rows with angular spaces 12, 12 between the groups to provide an effective combing action tending to cause the hairs on the face to project into the apertures 11 to be cut off. At the outer end of the cylindrical head 10, there is a fixed cross-piece 13 on which is arranged at the center a fixed trunnion 14 on which is journalled one end of a sleeve 15 which carries a spider 16 (see Figure 4) at the outer end of the cutter so as to be rotatable therewith. This spider may be formed with a set of blades 16a, 16a to provide a blower fan. At its inner end sleeve 15 has thereon a spider 17. The spiders 16 and 17 provide supports in which the ends of blade mountings 18, 18 may be journalled. The blade mountings themselves are shown at 19, 19 and may comprise sheet metal folded upon itself to provide grooves at 20, 20 for snugly receiving blades 21, 21 so that these blades, which may be similar to ordinary safety razor blades, may be removably placed in the grooves 20 of holders 19.

It is to be understood that in accordance with one purpose of this invention, the blades are to have a cutting edge so as to have a cutting action on the hairs as distinguished from a mere shearing clipper-like action as heretofore used.

Sleeve 15 is designed to be removably slipped on a square shaft 22 which is an extension of a motor shaft 23 arranged to be driven in any suitable manner by a motor housed in the shaver handle 24, as will be understood by those skilled in the art. Sleeve 15 is deformed as shown at 15a, 15a (see Figures 2, 5 and 8) whereby sleeve 15 is squared at this point so as to be in such engagement with shaft 22 as to be rotated thereby. The sleeve 15, however, is slidable on shaft 22 and is removable from said shaft as will be described.

Holders 19 are so arranged on the spiders 16 and 17 as shown in Figures 4, 5 and 6 as to direct the blades 21 into contact with the inside of the cylindrical head 10 in the direction of rotation of the shaft 22 and in order to hold the blades outwardly against the inside of the cylindrical head so as to have a cutting action in passing contact with the perforated portion of the head to cut the hairs off as they project through the openings 11, springs 25, 25 are provided, these springs normally serving to swing blades 21 outwardly as shown in Figure 5 and thereby holding them in contact with the inside of the cylindrical head as shown.

It is preferable to impart an axial oscillatory or reciprocatory movement to the rotary cutter during the shaving operation to produce a saw-like action on the hairs projecting through the openings 11. To this end the sleeve 15 is normally urged outwardly upon shaft 22 by means of a compression spring 26 arranged between a fixed collar 27 on shaft 23 and sleeve 15, and cross-piece 13 has a cam element 28 against which the end of sleeve 15 rides, the sleeve 15 having depressions at 15b therein (see Figure 4) which as they come into engagement the cam element 28 permits the spring 26 to move the cutter slightly outwardly toward the end of the cutter head. As the depressions at 15b ride out of engagement with the cam 28, the sleeve 15 and cutters will of course be moved backwardly against the action of springs 26 and thus the

cutter will be given a slight oscillatory or reciprocatory movement axially while it is being rotated, which effectively provides a saw-like as well as shearing cutting action at the apertures 11. The inner end of sleeve 15 is open so that the blowing action provided by the blades 16a on the spider 16 will blow hairs from the inside the cutter head out of the inner end of the cutter head. This blowing action, of course, also serves to cool the razor head. The head 10 may be mounted on the razor handle 24 in cooperative relation with the shaft 22, 23 by means of the brackets 29a, 29a, which may be connected to a rectangular tube of metal 29, fitted into a correspondingly shaped socket 30 in the handle 24, the tube 29 may be removably secured to the handle 24 by set screw 31.

In operation, the parts will be assembled as shown and the motor in the handle 24 will be continuously driven as will be understood, thus rotating the cutter in the head 10 and also giving slight reciprocatory or oscillatory movement to the cutter in the axial direction providing a saw-like action as well as a rotary cutting action in the cutter head. The apertured portion of the head 10 will be applied against the skin to be shaved and it will be moved to and fro over the skin in the usual way. When it is desired to remove and replace blades, the set screw 31 is loosened whereby the head 10 may be pulled off the handle 24 along with the rotary cutting element, the sleeve 15 of which slides off the shaft 22. The cutter element can then be dropped out of the inner end of the head 10, the blades removed and replaced as indicated in Figure 8 and then the parts can be re-assembled as shown by first putting the cutter in the head and then slipping the head with the cutter back over the shaft 22 and attaching the head to the handle.

It will be apparent from the foregoing that a highly improved electric shaver has been provided by the invention. Obviously, modifications thereof may be adopted without departing from the spirit thereof or the scope of the appended claims.

What is claimed is:

1. A power-operated shaver comprising a hollow cylindrical head, having a portion thereof apertured for application to a surface to be shaved and a rotary cutter in said head, one or more blades with sharp cutting edges carried by said rotary cutter and means for holding sides of the edges of said blades in contact with said casing at all times throughout rotation thereof to cause cutting edges of the blades to pass through hairs projecting into said casing through the apertures thereof, and means for simultaneously rotating and axially oscillating or reciprocating said cutter inside of said head in association with said apertures.

2. A power-operated shaver comprising a hollow cylindrical head apertured for application to a surface to be shaved, and a rotary cutter in said head, one or more sharp blades carried by said cutter and means for yieldingly urging said blades outwardly whereby sides of the edges of said blades are urged into contact with the inside of said head to present sharp edges of said blades to hairs extending into said head.

3. A power-operated shaver comprising a hollow cylindrical head having hair-receiving apertures, a rotary cutter in said head, blade holders carried by said cutter, and cutting edged blades removably mounted in said holders, and means for holding sides of said cutting edges in contact with said head at all times throughout rotation of said cutter to present the cutting edges of said blades to hairs extending into said head, said cutter being removable from said head whereby said blades can be removed and replaced.

4. A power-operated shaver comprising a hollow cylindrical head apertured for application to a surface to be shaved and a rotary cutter therein, said cutter having one or more sharpened or cutting-edged blades therein, means for rotating said cutter and means for holding the sides of the cutting edges of said blades in contact with the inside of the head all the while said cutter is rotating and throughout rotation thereof to present the cutting edges of said blades to hairs extending into the apertured head.

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