Oct. 18, 1955 S. I. WADSWORTH 2,720,696

ELECTRIC SHAVER

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Fig. 1

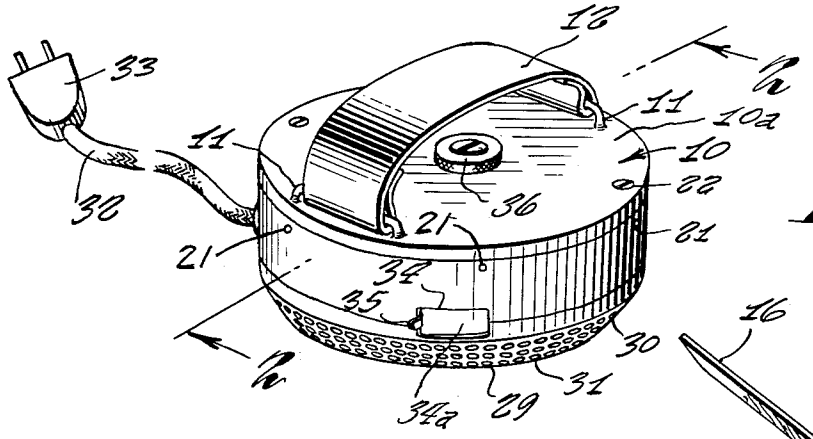


Fig. 3

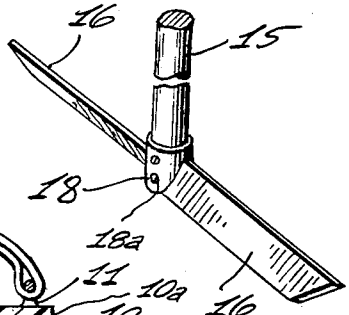


Fig. 2

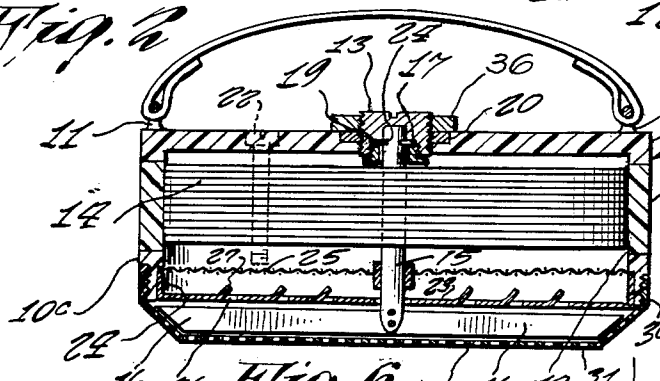


Fig. 6

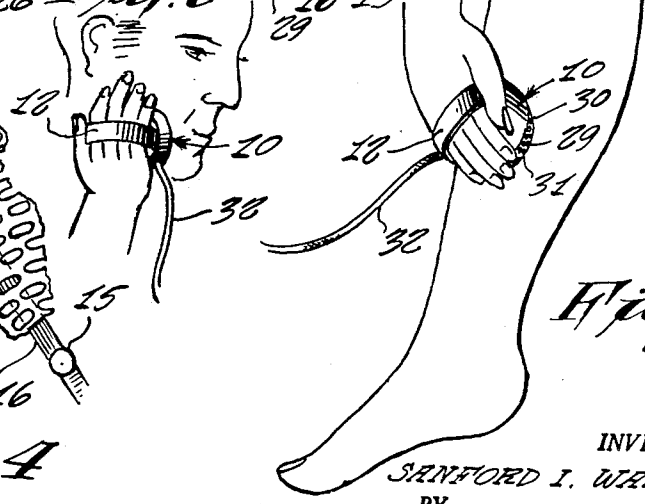


Fig. 5



Fig. 4

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ELECTRIC SHAVER

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6 Claims. (Cl. 30—41.5)

This invention relates to electric shavers.

It is an object of the present invention to provide an electric shaver for removing superfluous hair from the face or any other part of the body wherein the motive power is transmitted through a shaft to a cutter or blade so that the latter completes three hundred and sixty degree revolutions, either direct or geared to increase or decrease blade speed, and not employing the vibrator cam or oscillator principle.

It is another object of the present invention to provide an electric shaver of the above type which is air cooled, provides a more rapid shave, has an increased shaving area, reduces irritation to the skin, is less noisy; introduces a new diaphragm and valve arrangement, has an uninterrupted cutting surface and is faster than conventional mechanical shavers.

For other objects and a better understanding of the invention, reference may be had to the following detailed description taken in connection with the accompanying drawing, in which:

Figure 1 is a perspective view of the invention;

Fig. 2 is a vertical sectional view thereof, taken along the line **2—2** of Fig. 1;

Fig. 3 is a perspective view of the cutting blade;

Fig. 4 is an enlarged elevational view of the skin guard;

Fig. 5 is a perspective view showing the device being used to remove leg hair; and

Fig. 6 is a perspective view of the device being used to shave the face.

Referring now to the figures, **10** represents generally a housing and case assembly including a cover **10*a*** connected to a cylindrical motor chamber **10*b*** by means of screws **22** and a screen and diaphragm chamber **10*c*** suitably connected to the bottom of the motor chamber **10*b*** (Fig. 2), the cover **10*a***, motor chamber **10*b*** and screen and diaphragm chamber **10*c*** being formed of suitable plastic. The chamber **10*c*** is externally threaded at **30** and has screwed thereon an internally threaded skin guard or face plate **29**.

A plastic hand strap **12** is formed with doubled up loops at each end and is secured to the cover **10*a*** by means of the integrally formed strap holding portions **11**.

A fractional horsepower motor **14** is suitably mounted in the motor chamber **10*b*** and includes a drive shaft **15** extending therefrom in both directions. The upper end of the drive shaft **15** is supported in an externally threaded bushing **13** provided in the top **10*a***. The bushing **13** is screw threaded into an insert **20** provided in the top of the case **10*a***, the upper end of the bushing **13** being provided with a screw driver slot to permit vertical adjustment of the shaft and to thereby provide the blade or blades **16** adequate clearance in relation to the face plate or skin guard **29**. A knurled lock nut **36** is screw threaded on to the bushing **13** and prevents the latter from losing the proper blade adjustment once attained. The upper portion of the shaft **15** is provided with an annular groove **24** in which is positioned a snap ring **17** which is also

received in the partially slotted bushing **13** to insure the up and down adjustment of the shaft **15** with the bushing **13**.

The inside of the screen and diaphragm chamber **10*c*** is provided with an annular groove **24** within which is positioned a diaphragm assembly **23**, a very fine wire mesh screen **25** being secured intermediate the flanged portion of diaphragm **23** and groove **24**. The diaphragm **23** is provided with a plurality of upwardly struck openings **26** which are adapted to permit the upward movement therethrough of hair while at the same time preventing its return movement by means of the portions **27**.

The adjacent portions of the motor chamber **10*b*** and screen and diaphragm chamber **10*c*** are provided with the opening **34** (Fig. 1) adapted to be opened and closed by a sliding door **34*a*** moved by finger **35**, thus providing a hair ejector. Thus, hairs blown upwardly through the diaphram **23** will be retained therewithin by screen **25** until ejected through the door **34*a***.

A cutting blade **16** is secured to the bottom end of the drive shaft **15** within the skin guard **29** by means of the holder **18** and the screws **18*a***.

The skin guard **29** over its entire surface is provided with elongated and staggered openings **31** adapted to receive therethrough the hair of the user, the skin guard **29** being case hardened preferably.

An electric cord **32** carrying a male plug **33** at one end for connection to a suitable source of power is adapted to be plugged into the motor **14** through casing **10** in any suitable manner, for example by a male and female plug arrangement or by a bayonet slot construction. The blade **16** is attached to the shaft **15** at an angle of attack (approximately forty-five degrees) to the flat inside surface of perforated guard **29** to most efficiently cut hair protruding through openings **31**, as the device is moved gently over the desired area during operation of motor **14**. The door **34*a*** for ejecting hair may be, of course, hinged to the casing, if desired. In operation, the device is connected to a suitable source of power by means of the plug **33**, and the hand is engaged under the strap **12** at the top (Fig. 6) and the device applied over the desired area in gradual circular or up and down movements with the guard **29** in contact with the skin. Abrupt or critical areas may be shaved by tilting the device so that the forty-five degree angle of the blade **16** and the guard **29** will provide a more controlled shave, for example when shaving sideburns or a moustache. As contact is made on the skin by the shaver, the hairs are cut close to the skin and thrust against the diaphragm **23** where they pass upwardly through the openings **26** and are trapped by the portions **27** from returning until removed from the device through the hair ejector door **34*a*** between shaving operations. The unique effect and purpose of the angle of attack of the blade or blades **16** is to create a slight suction against the hair and skin, providing a closer shave, and as cut hairs are thrust through the diaphragm **23** against the screen **25**, the air passes upwardly through the screen to cool the motor **14** and making the device more comfortable to the user. The air will then vent to the atmosphere through suitable holes **21** provided at the top side of the case. The slotted adjustable bushing **13** controls the clearance between the blades and the guard, thus permitting the desired closeness of shave.

While various changes may be made in the detail construction, it shall be understood that such changes shall be within the spirit and scope of the present invention as defined by the appended claims.

Having thus set forth and disclosed the nature of my invention, what is claimed is:

1. An electric shaver comprising a hollow casing having a rear closure and a front opening, an electric motor secured within said casing adjacent said rear closure and

having a central drive shaft extending through said rear closure and through said front opening, a skin guard secured across said front opening and having perforations, a cutter blade secured to the forward end of said drive shaft in the vicinity and slightly spaced from the interior of said guard, filter means intermediate said blade and said motor and externally operable means for adjusting the position of said shaft relative to said motor for varying the distance between said blade and guard.

2. The electric shaver as set forth in claim 1, in which said filter means comprises a diaphragm above said blade which has rearwardly struck openings permitting the rearward passage of hair therethrough but preventing its return, and a wire screen intermediate said diaphragm and said motor, said casing intermediate said diaphragm and screen having an ejector opening.

3. The electric shaver, as set forth in claim 1, in which said externally operable means comprises an externally threaded bushing screw threaded in said rear closure and having a screw driver slot, the rear end of said shaft being received within said bushing, snap ring means connecting said shaft and bushing and lock nut means for locking said bushing relative to said rear closure.

4. The electric shaver, as set forth in claim 1, in which said skin guard has a bevelled periphery, the ends of said blade are correspondingly bevelled, and the pitch of said

cutter blades relative to said skin guard is substantially forty-five degrees.

5. The electric shaver, as set forth in claim 1, which includes a hand strap secured across the rear of said casing and a removable electric cord for energizing said motor upon being plugged in at each end.

6. An electric shaver comprising a hollow casing having a rear closure and a front opening, an electric motor secured within said casing adjacent said rear closure and having a central drive shaft extending through the front opening, a skin guard secured across the front opening and having perforations, a cutter blade secured to the forward end of said drive shaft in the vicinity and slightly spaced from the interior of said guard, filter means intermediate said blade and said motor, said filter means comprising a diaphragm above said blade which has rearwardly struck openings permitting the rearward passage of hair therethrough but preventing its return, and a screen intermediate said diaphragm and said motor, said casing intermediate said diaphragm and screen having an ejector opening.

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