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ELECTRIC SHAVER HAVING BUILT-IN COOLING MEANS

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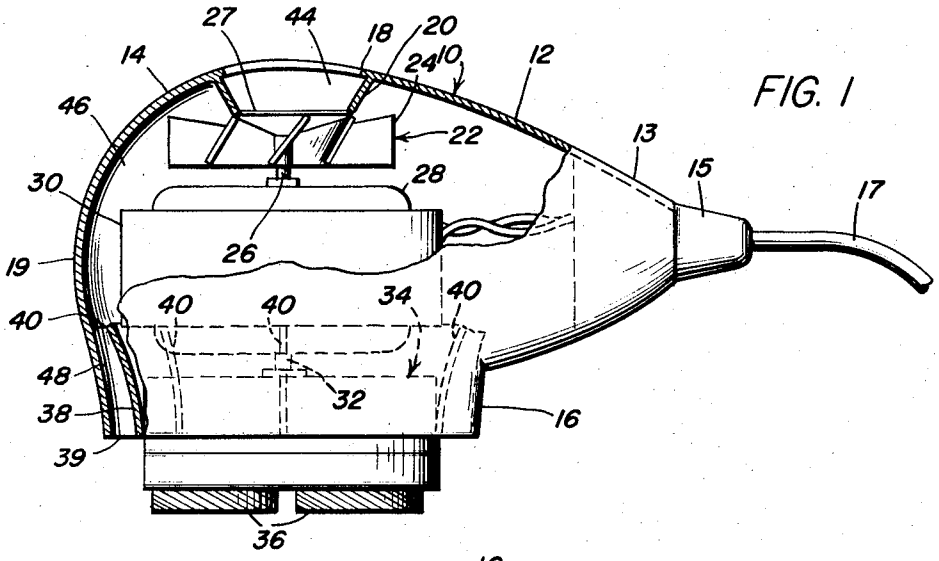


FIG. 1

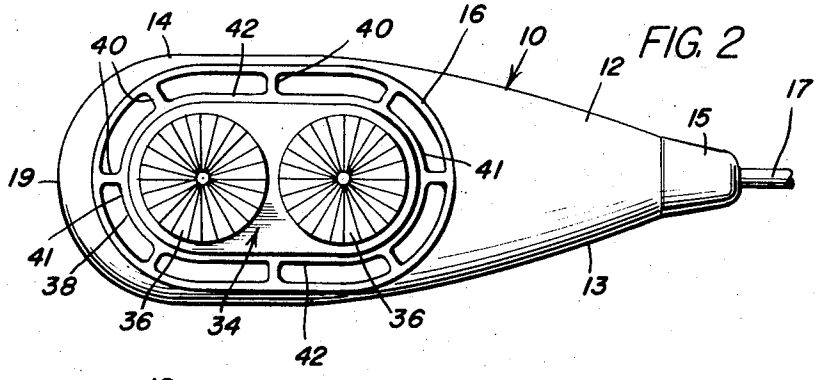


FIG. 2

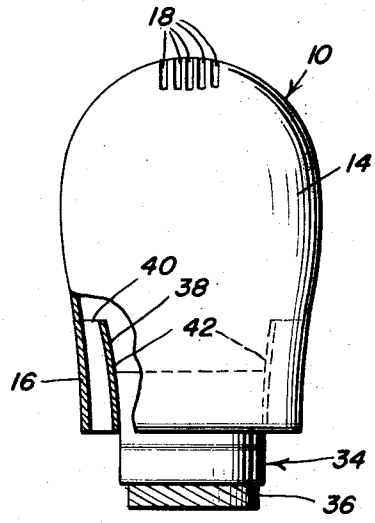


FIG. 3

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ELECTRIC SHAVER HAVING BUILT-IN COOLING MEANS

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3 Claims. (Cl. 30—34)

This invention relates generally to electrical shavers.

Heretofore, electrical shavers have been so designed that the shaver head tends to increase in temperature during use, as a result of operation of the motor, and as a result of friction between the shaver head and the skin.

The skin, as a result, has been warmed, and this in turn has produced a certain amount of discomfort. Further, increased humidity or dampness of the skin results, making more difficult the task of removal of the small, fine hairs of the beard.

Friction between the shaving head and the skin has been reduced, heretofore, only by putting a high polish upon the skin-contacting portions of the shaving head, but this has been an expedient which has been not proved to be entirely satisfactory.

In view of the above, an important object of the present invention is to provide a generally improved electrical shaver, having a built-in cooling means, so designed as to reduce the humidity of the skin and provide a cooling of the skin in the area in which, at the moment, the shaving action is occurring, thus to produce maximum comfort, less friction between the skin and the shaving head, and less irritation of the skin.

A more particular object is to provide a shaver as described which will have the built-in cooling device mentioned above, while still being capable of fully efficient use as a shaver, that is, the cooling device does not interfere in any way with normal operation of the shaver.

A further object is to provide, in an electrical shaver, a built-in cooling device which will direct air against the skin through an area that extends completely about the shaving head, so that during the movement of the device, the shaving head will contact portions of the skin which have, immediately before said contact, been effectively cooled by the cooling means.

Still another object is to provide a device of the character stated that will be provided with a novelly designed air-flow-inducing means, so formed as to produce maximum air flow from a relatively small, shaver-head-operating motor.

Still another object of importance is to provide a device of the character stated that will be so formed as to include a particularly shaped housing for the motor and shaver head which will result in a vacuum or suction compartment into which the air will first be drown, extending into communication with a pressure compartment into which air will be forced and then directed under heavy pressure outwardly about the shaving head against the skin.

Yet another object is to provide a device of the character stated which will be compact, easy to handle, and capable of manufacture at little or no increase in cost above that required for the making of electric shavers not having the desirable characteristics of the invention.

These together with other objects and advantages which will subsequently become apparent reside in the details

of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawing, forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a view of the improved electrical shaver, partly in side elevation and partly in longitudinal section;

Figure 2 is a bottom plan view thereof; and

Figure 3 is an end elevational view of the shaver as seen from the left of Figure 1, a portion being shown in section.

Referring to the drawing in detail, designated generally at **10** is an electric shaver, which in respect to its general size is of approximately the same size as conventional shaver can be conveniently held in one hand and manipu- electric shavers not having a cooling means, that is, the lated over the skin.

The shaver constituting the invention includes a casing **12**, and said casing has a tapering rear end portion **13** which at its smaller end will have the usual prong-receiving sockets or receptacle, not shown, in which may be engaged an electric plug **15** from which extends a cord **17**.

The tapering rear end portion **13** merges, at its forward, larger end, into a main or head end portion **14**, which is of dome-like formation as clearly shown in Figure 1, with a rounded front end wall **19**.

Formed in the top or crest portion of the head end portion **14** is a series of narrow, longitudinally extending air inlet slots **18** defining openings through which air may enter the housing in the direction of the arrows shown in Figure 1. Integral or otherwise made rigid with the wall of the housing, and extending about the opening **18**, is a downwardly tapering shield **20**. Shield **20** is continuous over the full periphery of the opening **18**, and at its inner, narrower end, terminates immediately above the plane of rotation of a suction fan generally designated **22**, having a series of blades **24** radiating from a shaft **26** that is extended perpendicularly to the plane of the inner end **27** of shield **20**, and that is also perpendicular to the plane of rotation of the fan.

Shaft **26** extends from an electric motor **28**, said motor including a body portion **30**. The opposite end **32** of the shaft projects from the body or casing of the motor, into a shaving head generally designated **34**. The shaving head is per se conventional, and in the particular type of shaver illustrated, said head includes circular cutting rotors **36** turning on axes parallel to each other and to shaft **32**.

Snugly receiving shaving head **34** is an oblong, endless deflector **38**, which tapers in a direction toward a large outlet opening **39** of casing **12**, said opening **39** being formed in a shaving-head-receiving, lateral extension **16** of the casing.

The shaving head projects a substantial distance outwardly through the opening **39**, with the deflector **38** having rounded or semi-circularly curving end walls **41** and straight side walls **42**.

Integrally connected between the deflector **38** and the wall of the projection **16** are uniformly spaced baffles **40**. The baffles **40** are pitched obliquely to the axis of rotation of the shaft **32**, so that air that is passing out of the housing through the annular space defined between the wall of projection **16** and the deflector **38** will be imparted a whirling movement, so as to strike the skin at an angle, rather than while traveling in a path directly broadside to the skin. This will produce maximum comfort, and will also cause the air to be directed against the skin over a large area.

In use of the device, on operation of the motor the fan

22 will be operated in a direction to suck air into the suction compartment designated at 44 in Figure 1 and defined in the space bounded by the shield 20. This will be an area in which a continuous suction or vacuum will be present during operation of the fan.

The air is drawn out of the compartment 44 through the space between the blades in the fan and is directed downwardly outwardly from the compartment 44, following the direction of the arrows shown in Figure 1, passing about the casing of the motor 28. The air, thus, flows in an annular column downwardly into the pressure compartment designated 46 in Figure 1, said pressure compartment being the hollow interior of the housing, in which space the motor is mounted.

Within the compartment 46, the air will be placed under pressure due to the fact that it is caused to pass out of the compartment only through a relatively restricted area designated at 48 and constituting an annular flow passage defined between deflector 38 and the wall of the projection 16. The air in this passage is imparted the whirling movement or oblique travel previously described, thus to strike the skin obliquely to the surface of the skin and provide a desirable cooling action over the full area surrounding the shaving head.

The air outlet 39, in this connection, is disposed approximately one-half inch from the skin, so that there is a minimum dissipation of air prior to impingement against the skin. As a result, when the air hits the more or less humid or damp skin, evaporation of the moisture in the skin is speeded, lowering the moisture content of the skin. This causes the hairs to stand out to a greater extent, and at the same time, the skin is effectively cooled, in a manner designed to produce maximum comfort so far as the user of the device is concerned.

Accompanying the decrease in the moisture content of the skin is a considerable reduction in friction between the shaver and the skin. The reduction of said friction tends to increase to a marked degree the comfort with which one operates the device, and at the same time, there is a corresponding reduction of irritation of the skin.

It will be noted that the device is such as to permit manufacture thereof at a cost comparing favorably with that of shavers not having the beneficial characteristics of the invention. The shaver, at the same time, is of highly compact construction, and is capable of being manipulated with considerable facility, in the same manner as a shaving device not having the cooling means of the invention incorporated therein.

At the same time, the maximum cooling action is obtained while still permitting utilization of the same size motor as is presently required. The motor shaft is merely extended in an opposite direction from the casing, so as to operate the fan as well as the shaving head.

From the foregoing, the construction and operation of the device will be readily understood and further explanation is believed to be unnecessary. However, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the appended claims.

What is claimed as new is as follows:

1. An electric shaver comprising a hollow housing having an air inlet opening and an outlet opening; a shaving head centrally mounted in said outlet opening, and defining in cooperation with the edge of the outlet opening an annular space through which air may pass out of the housing to impinge against the skin; a motor mounted within the housing and driving the shaving head; and a suction fan driven by the motor arranged to draw air through the air inlet into the housing, baffles arranged about the shaving head within the outlet opening in positions extending obliquely to the axis of the opening peripherally of said shaving head, whereby to impart a swirling movement to the air passing out of the housing.

2. An electric shaver as in claim 1, wherein the air outlet opening is elongated in a direction longitudinally of the housing.

3. An electric shaver as in claim 1, in which a continuous deflector is snugly received within said outlet opening, said baffles are fixedly connected between the wall of the housing and the deflector.

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