

Dec. 26, 1967

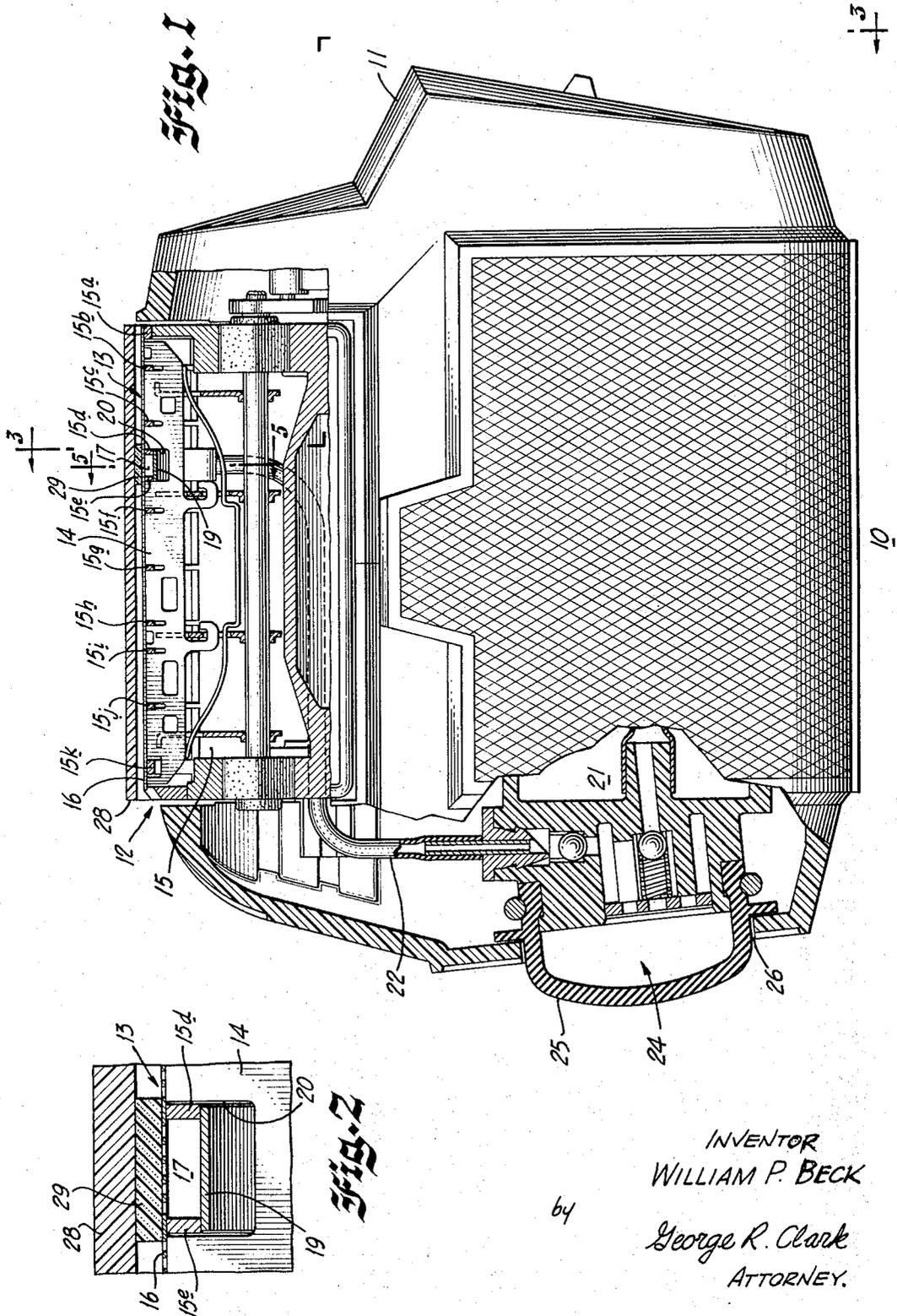
W. P. BECK

3,359,634

ELECTRIC DRY SHAVER

Filed July 19, 1965

2 Sheets-Sheet 1



INVENTOR
WILLIAM P. BECK

George R. Clark
ATTORNEY.

64

Dec. 26, 1967

W. P. BECK

3,359,634

ELECTRIC DRY SHAVER

Filed July 19, 1965

2 Sheets-Sheet 2

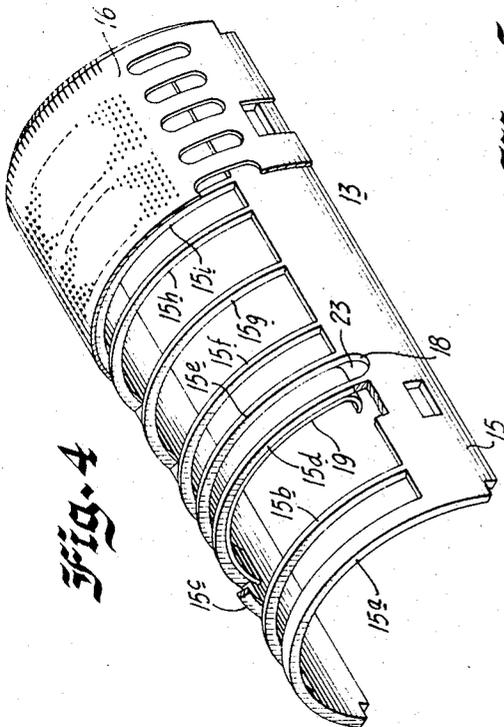
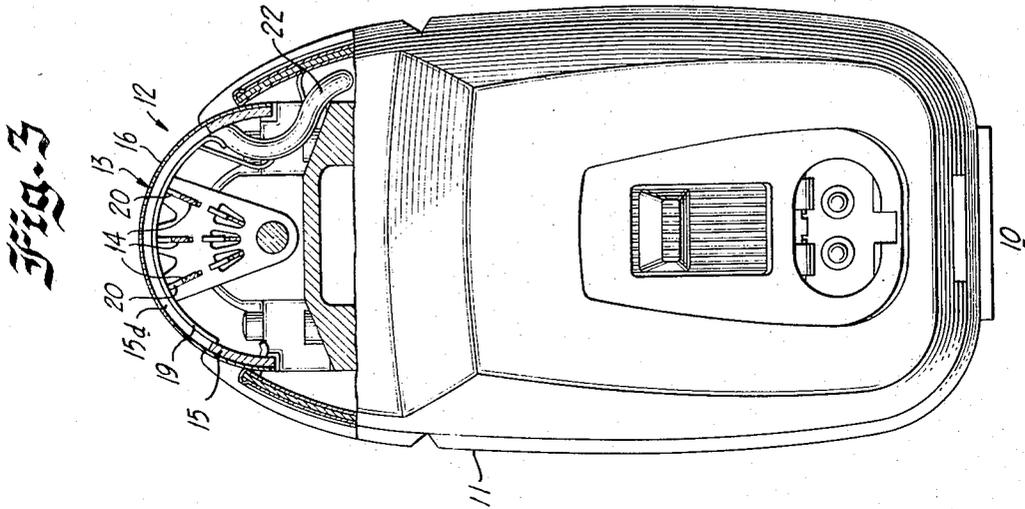
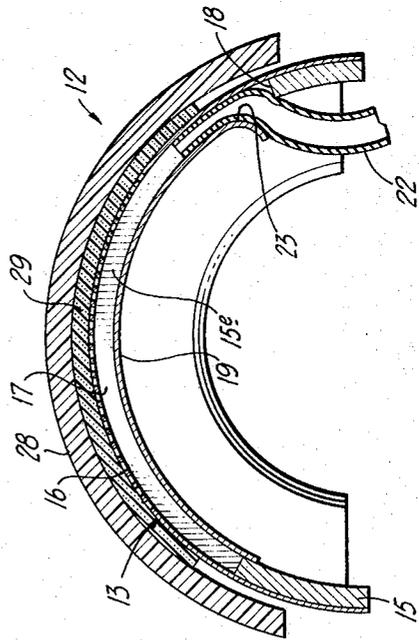


Fig. 5



INVENTOR
WILLIAM P. BECK

by

George R. Clark.
ATTORNEY.

1

3,359,634

ELECTRIC DRY SHAVER

William P. Beck, Westchester, Ill., assignor to Sunbeam Corporation, Chicago, Ill., a corporation of Illinois
Filed July 19, 1965, Ser. No. 473,126
4 Claims. (Cl. 30—41)

ABSTRACT OF THE DISCLOSURE

Electric shaver having chamber associated with shaving head holding friction-reducing substance. This chamber is in direct communication with the shaving surface through perforations or openings in the shaving head and the substance is fed by capillary action. Means are included to seal off openings when shaver is not in use.

The present invention relates to electric dry shavers and, more particularly, to improved apparatus for dispensing a friction-reducing substance or "glide agent" onto the skin of a user while shaving with such a dry shaver.

Electric dry shavers, as distinguished from "wet type" razors, are very widely used and their popularity is constantly increasing. This is largely due to the ease and convenience of shaving with a dry shaver. In contrast to the conventional "wet type" razor with which it is necessary to use lather, towels, water and so forth, a dry shaver can be conveniently used when the user is fully dressed. Obviously, shaving with a razor of the wet type cannot be conveniently accomplished when the user is fully dressed.

One problem which may arise in connection with the use of electric dry shavers is possible excessive friction between the shaving head of the shaver and the skin of the user. If the user's skin is dry, it may happen that the friction between the skin and shaver makes it difficult to smoothly glide the shaving head over the skin during the shaving operation. One suggestion that has been advanced to overcome this problem is to wet the face before shaving with water or with a specially prepared lubricating liquid. Unfortunately, water or other liquids used for this purpose dry quickly and any lubricating effect essentially disappears before the shaving operation is completed.

In view of this difficulty, it has been suggested that a suitable friction-reducing substance or "glide agent," such as a liquid or a powder, be applied to the skin of the user periodically throughout the shaving process. For example, in Werft Patent No. 3,103,299 and Gwinn Patent No. 3,176,392, both assigned to the same assignee as the present application, there are described electric dry shavers including means for storing a supply of a friction-reducing liquid or powder and means for periodically squirting or spraying the glide agent from the shaving head onto the face of the user. Although the arrangements disclosed in those applications are suitable for their intended purposes, it has been found that it may be difficult for the user of the shaver to apply the proper amount of friction-reducing material onto the proper areas of the face during shaving. For example, with a squirting or spraying arrangement, the user of the shaver frequently applies either too much or too little of the glide agent onto his face. It would be desirable to provide an arrangement where it is unnecessary to stop shaving or to hold the shaver at a distance from the face in order for the liquid or powder to be applied to the shaving area.

Accordingly, it is an object of the present invention to provide a new and improved electric dry shaver including novel means for applying a friction-reducing substance onto the surface from which hair is to be removed.

It is another object of the present invention to provide an electric dry shaver including novel means for applying, in a gradual and continuous manner, a friction-reducing

2

substance onto the area from which hair is to be removed.

It is another object of the present invention to provide liquid dispensing apparatus in an electric dry shaver capable of applying a friction-reducing substance onto the area from which hair is being removed in the exact locations and at the exact time required properly to lubricate the skin.

It is still another object of the present invention to provide an electric dry shaver including means for dispensing a friction-reducing substance onto the skin being shaved during shaving without discontinuing the shaving operation.

It is another object of the present invention to provide novel means for sealing the supply of friction-reducing liquid when the shaver is not in use.

Further objects and advantages of the present invention will become apparent as the following description proceeds, and the features of novelty which characterize the invention are pointed out with particularity in the claims annexed to and forming a part of this specification.

For a better understanding of the present invention, reference may be had to the accompanying drawings wherein:

FIG. 1 is an elevational view with certain portions cut away of an electric dry shaver incorporating the features of the present invention and showing the comb guard in position for protecting the cutting surface;

FIG. 2 is a greatly enlarged fragmentary view of a portion of FIG. 1;

FIG. 3 is a partial sectional and partial end view taken on line 3—3 of FIG. 1 assuming FIG. 1 shows the complete structure but with the comb guard removed;

FIG. 4 is a perspective view of the comb of the shaver of FIG. 1 with certain portions cut away more clearly to illustrate the invention; and

FIG. 5 is an enlarged fragmentary sectional view taken on line 5—5 of FIG. 1 with the blades and blade supporting means omitted and, again, assuming FIG. 1 shows the complete structure.

Briefly, the present invention comprises an electric dry shaver having a shaving head including a relatively fixed portion and means movable with respect to the fixed portion for cutting hairs on the surface of a skin area contacted by the shaving head. In order effectively to reduce friction between the shaving head and skin, a chamber for holding a supply of a friction-reducing substance is associated with the shaving head, and the chamber is in communication with the surface of the shaving head through openings or perforations. Throughout the shaving process, friction-reducing substance gradually travels from the chamber, through the openings and onto the skin contacted by the shaving head by a seeping or capillary type action. The shaver also includes a comb guard fitting over the shaving head when the shaver is not in use, and a sealing pad is mounted on the comb guard to seal the chamber and prevent leakage or evaporation of the glide agent or friction-reducing substance.

Although the present invention, as will become apparent from the ensuing description, is applicable to any electric shaver having a shaving head with relatively movable cutting members, it is specifically illustrated as associated with the well-known electric shaver having an arcuate comb with blade type cutting means moving in shearing engagement with the comb and oscillating back and forth in such shearing engagement.

Referring now to the drawings, there is illustrated an electric dry shaver designated generally as 10 incorporating the features of the present invention. The shaver 10 may have any well-known construction and has been illustrated as very similar to the shaver shown in copending Jepson et al. application Serial No. 295,028, filed July 15, 1963, now Patent No. 3,311,763, granted March 28, 1967,

and assigned to the same assignee as the present application. The shaver 10 comprises a casing 11 having associated therewith a shaving head designated generally as 12. The specific shaving head 12 illustrated includes a perforated comb 13 removably secured to the casing 11 and movable cutting means comprising one or more blades such as 14 mounted for oscillatory movement in shearing engagement with the inside surface of comb 13. A suitable prime mover, not shown, disposed within casing 11 causes relative movement between the comb 13 and the movable cutting means 14. A detailed description of the specific shaving head and means for operating the same is included in the aforesaid Jepson et al. copending application.

In order to provide a source of friction-reducing substance at the cutting surface of the electric shaver to serve as a constant source of such friction-reducing substance during the entire shaving operation, the comb 13 of the present invention has been modified slightly from that disclosed in the above-mentioned Jepson et al. copending application to provide a chamber immediately adjacent the cutting surface for supplying the friction reducing substance. It will be understood that arcuate combs such as the comb 13 generally comprise a supporting frame 15 (FIG. 4) having a plurality of arcuate spaced ribs 15a, 15b, 15c, 15d, 15e, 15f, 15g, etc. comprising an integral part of the frame 15. The comb 13 also includes a thin, flexible, perforated plate 16 which is suitably secured to the concave surface of the arcuate ribs in a well-understood manner.

In accordance with the present invention, a friction dispensing chamber 17 is defined between the ribs 15d and 15e and beneath the perforated plate 16 overlying these ribs. The ribs 15d and 15e are relatively closely spaced and at one end are interconnected by a semicircular surface 18 (FIG. 4). In order to complete the chamber 17, there is provided an arcuate plate 19 which is secured by welding to the underside of the ribs 15d and 15e. It will be understood that the plate 19 must not extend beyond the ribs 15d and 15e, as best shown in FIG. 2 of the drawings. The one or more cutting blades 14 are provided with a slot 20 to accommodate the chamber 17. This slot or recess 20 is similar to those provided to accommodate the other ribs, such as 15a, 15b, 15c, etc., of the comb 13 in a well-understood manner.

When a suitable friction reducing substance such as a liquid glide agent is supplied to the chamber 17, this material seeps or moves by capillary action through the perforations in the flexible comb plate 16 onto the skin of the user as the shaving operation proceeds. Because of the fact that the perforations in the flexible comb plate 16 are relatively small, capillary action actually causes the liquid or material contained in chamber 17 to move to the surface of the comb. At the same time the surface tension of the liquid prevents it from freely running out of the perforations. Thus, the friction-reducing agent is dispensed gradually and evenly onto the skin of the user and exactly where it is needed, namely, where the shaving is actually taking place at the time the liquid or friction-reducing substance is dispersed. The liquid moving through the perforations by capillary action will, of course, wet the skin in the desired manner.

It will be appreciated that the chamber 17 is relatively small and of necessity must be of limited size in order not to reduce the cutting area of the shaving head 12. In order to provide a constant supply of the friction-reducing substance for the chamber 17, the shaver 10 is preferably provided with a storage tank generally designated as 21 with suitable means, not shown, for refilling the same when necessary. The tank 21 is connected to the chamber 17 by suitable flexible conduit means 22 which is preferably insertable into an opening 23 provided by terminating the plate 19 short of the curved surface 18, as best shown in FIGS. 4 and 5 of the drawings. It will be understood that the reserve storage tank 21 may have

a supply of friction-reducing substance under pressure. Preferably and as illustrated in FIG. 1 of the drawings, there is interposed between the storage tank 21 and the conduit 22 a suitable pump generally designated as 24 whereby the operator may selectively pump the friction-reducing substance from the storage tank 21 to the dispensing chamber 17. As illustrated, the pump 24 includes a resilient button 25 which projects through an opening 26 in the housing 11. By depressing the resilient button 25, air is forced into the storage tank 21 and the friction-reducing substance contained therein is forced into flexible conduit 22. The details of the pump mechanism 24 form no part of the present invention.

At the end of the shaving operation, there may still be a supply of friction-reducing substance within the dispensing chamber 17. In order to prevent this material from leaking through the perforations or from evaporating, there is provided the conventional comb guard 28 (FIGS. 1, 2 and 5). This comb guard is provided with a sealing pad 29 secured to the underside thereof in any suitable manner. Preferably, this sealing pad 29 is formed of a resilient substance, such as foam rubber or foam plastic, suitably bonded to the concave side of the comb guard 28 in a manner to overlie and engage the area of the perforated plate 16 defining the chamber 17.

In view of the detailed description included above, the operation of the present invention will readily be understood by those skilled in the art. There has been provided, immediately adjacent the cutting surface of the shaver 10, a chamber which constantly and gradually feeds to the cutting surface a friction-reducing substance. This substance is maintained in said chamber substantially at atmospheric pressure.

While there has been illustrated and described a particular embodiment of the present invention, it will be apparent to those skilled in the art that numerous changes and modifications will occur. For example, although the invention has been described in connection with a dry shaver of the oscillating type, features of the invention could be used in reciprocating or rotary head type shavers without departing from the scope of the invention. Thus, it is contemplated by the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the present invention.

What is claimed as new and desired to be secured by Letters Patent of the United States is:

1. In an electric shaver, the combination of a pair of relatively movable cutting members including a skin-engaging member having a plurality of hair receiving perforations, and reservoir means defined in part by said skin-engaging member for maintaining a supply of friction-reducing substance against said skin engaging member over an area encompassing a substantial number of perforations at a pressure substantially equal to atmospheric pressure whereby said friction-reducing substance is gradually applied onto the skin surface through said perforations in said skin-engaging member by capillary action.

2. The electric shaver of claim 1 wherein guard means for said skin-engaging member are provided, said guard means including means for sealing the area of said skin-engaging member through which said substance is dispensed.

3. An electric dry shaver comprising a casing, a comb including a comb support mounted on said casing having a plurality of spaced arcuate comb supporting ribs and a perforated plate mounted on said ribs, a blade, means for moving said blade in shearing engagement with the rib side of said perforated plate, means defining a chamber between two adjacent ribs and said plate, means defining a recess in said blade for accommodating said chamber, means defining an opening in said chamber, and means for supplying a friction-reducing substance to said chamber through said opening, whereby said substance is gradually applied from said

5

chamber onto the skin of the user through said perforated plate by capillary action.

4. The shaver of claim 3 including a comb guard to protect said comb when said shaver is not in use, and a resilient sealing pad mounted on said guard for engaging the portion of said plate between said two adjacent ribs to seal said chamber against leakage of said substance through perforations in said plate.

References Cited

UNITED STATES PATENTS

1,335,840	4/1920	Kaylor -----	30-41
1,544,112	6/1925	Sullivan -----	30-41

1,974,175	9/1934	Coggins -----	30-90
1,991,405	2/1935	Merriman -----	30-41
2,049,718	8/1936	Pearson -----	30-90
2,120,940	6/1938	Minassian -----	30-41
2,320,807	6/1943	Upham -----	30-90
2,608,756	9/1952	Jepson -----	30-90
2,630,264	4/1953	Ganzer -----	30-90
3,139,683	7/1964	Waldman -----	30-41
3,176,392	4/1965	Gwinn -----	30-41
3,252,217	5/1966	Werft -----	30-41

6

MYRON C. KRUSE, *Primary Examiner.*

WILLIAM FELDMAN, *Examiner.*