

Jan. 24, 1967

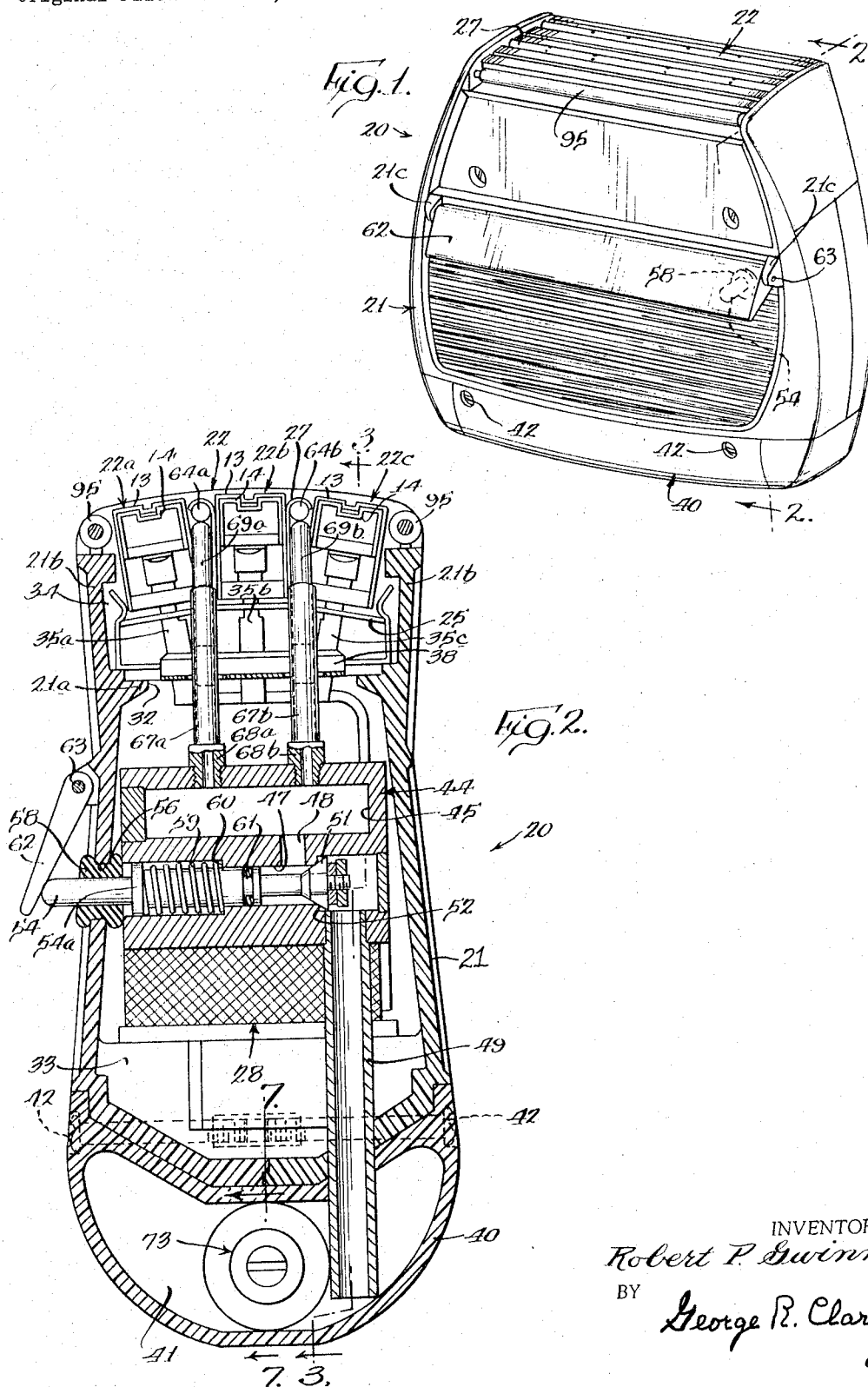
R. P. GWINN

3,299,506

GLIDE AGENT DISPENSER FOR ELECTRIC SHAVER

Original Filed Jan. 21, 1963

5 Sheets-Sheet 1



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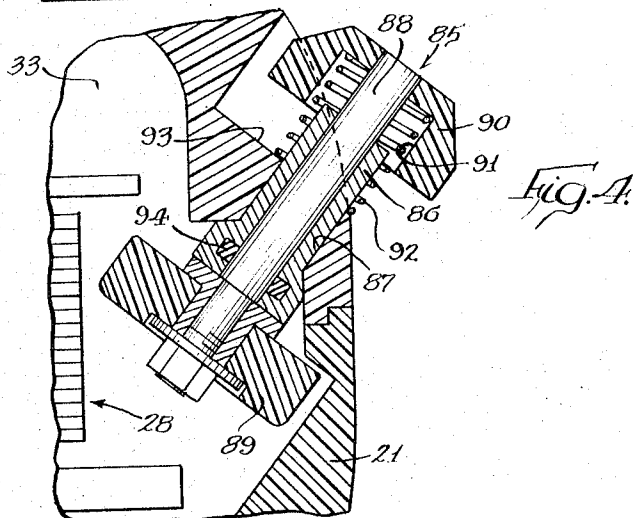
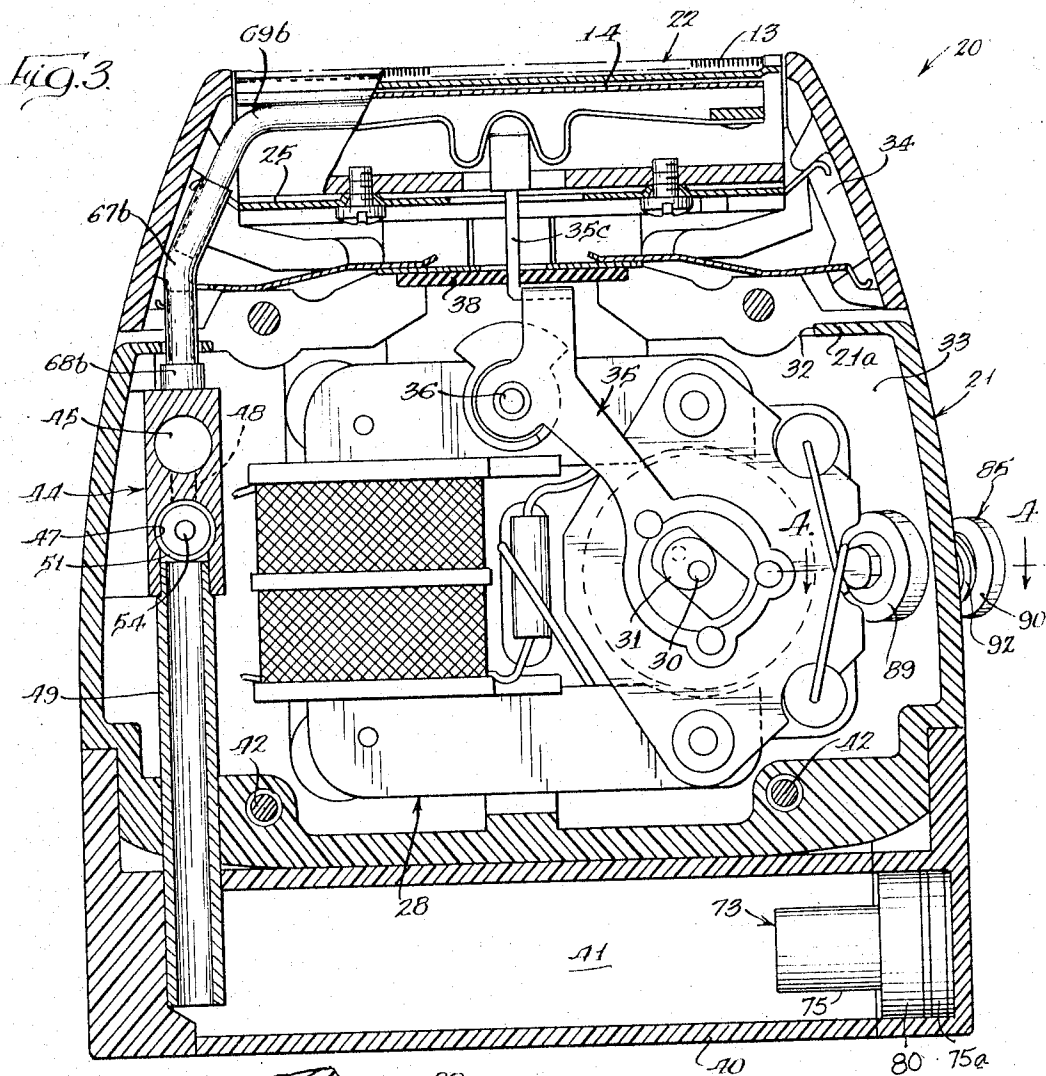
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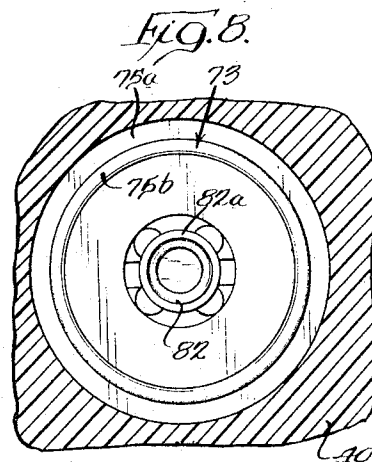
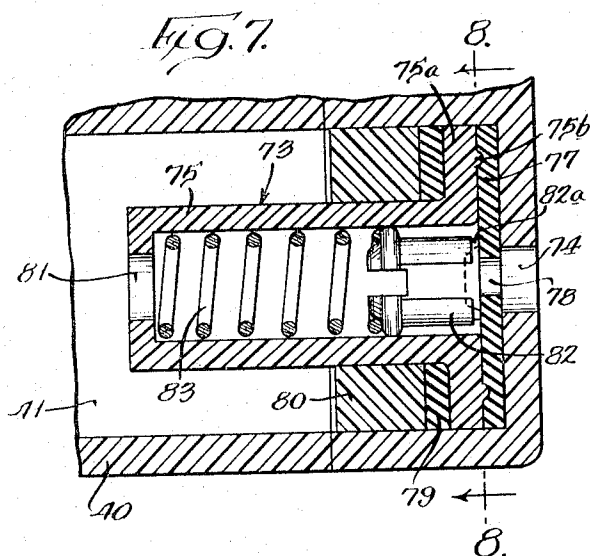
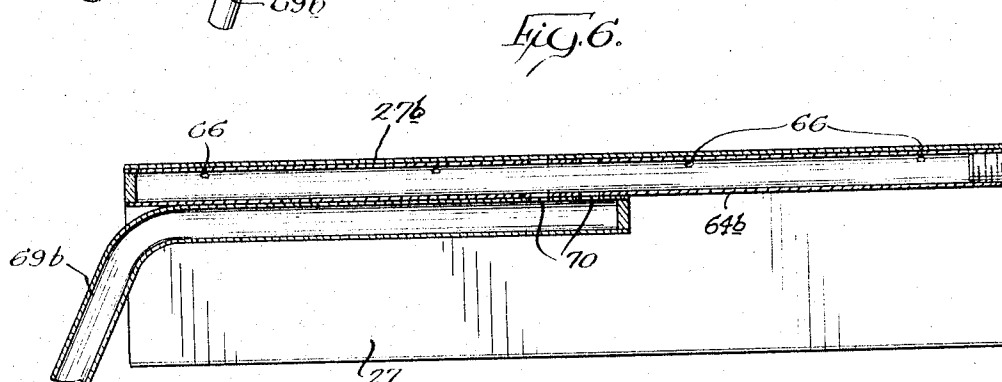
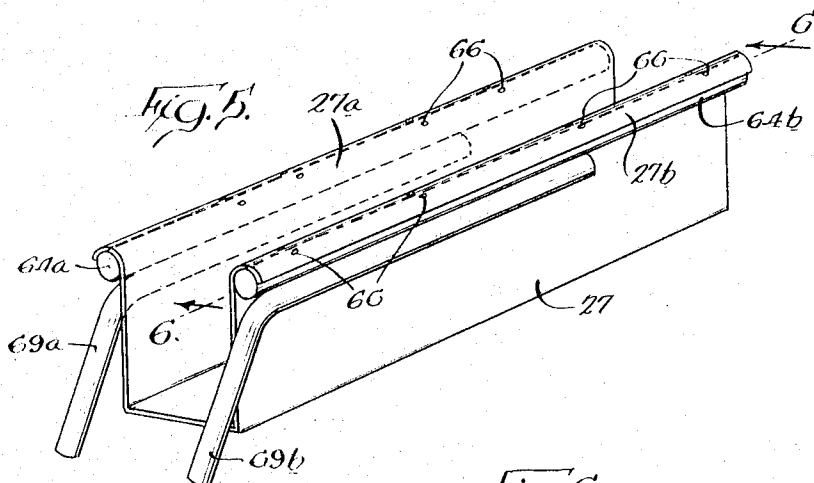
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GLIDE AGENT DISPENSER FOR ELECTRIC SHAVER

Original Filed Jan. 21, 1963

5 Sheets-Sheet 3



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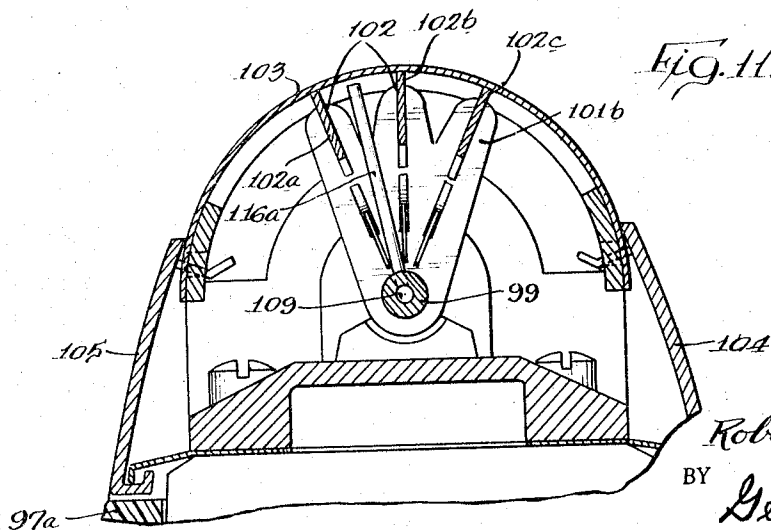
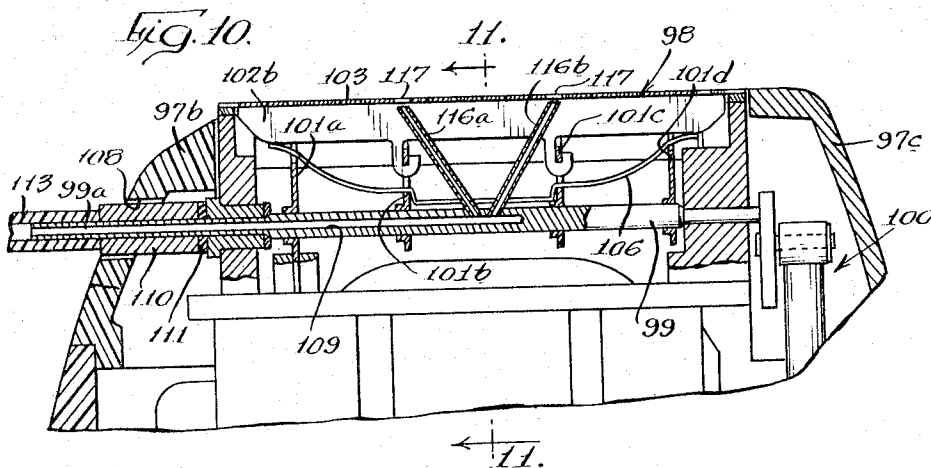
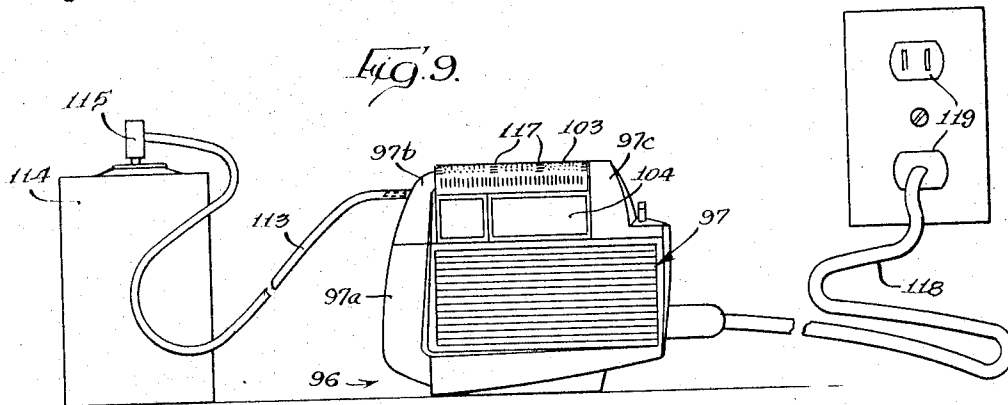
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GLIDE AGENT DISPENSER FOR ELECTRIC SHAVER

Original Filed Jan. 21, 1963

5 Sheets-Sheet 4



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3,299,506

GLIDE AGENT DISPENSER FOR ELECTRIC SHAVER

Robert P. Gwinn, Riverside, Ill., assignor to Sunbeam Corporation, Chicago, Ill., a corporation of Illinois
Original application Jan. 21, 1963, Ser. No. 252,663, now Patent No. 3,176,392, dated Apr. 6, 1965. Divided and this application Feb. 15, 1965, Ser. No. 432,687
2 Claims. (Cl. 30-41)

This application is a division of copending Gwinn application Serial No. 252,663, filed January 21, 1963, which has matured into Patent 3,176,392 granted April 6, 1965, and assigned to the same assignee as the instant application.

The present invention relates to apparatus for dispensing friction reducing substance adjacent the cutting portion of an electric shaver, and more particularly to dispensing what might be termed a "glide agent" adjacent the cutting surface of an electric shaver during the shaving operation to reduce the friction between such surface and the skin of the user from which hair is being removed.

The so-called electric dry shaver has been extensively used for many years and the popularity thereof is increasing constantly. This is primarily due to the fact that shaving with an electric dry shaver is simple, clean, and can be accomplished when the user is fully dressed. Today it is not even necessary that an electric power source be available, for electric shavers may be battery powered. This is in contrast to the conventional "wet type" razor where it is necessary to use lather, towels, water, etc. Obviously, shaving with a razor of the wet type cannot be conveniently accomplished where the user is fully dressed.

Some users of electric dry shavers have complained because of the friction between the cutting head and the skin of the user. It would be desirable to provide an improved shaving arrangement in an electric dry shaver whereby the friction between the cutting head and, for example, the face of the user is substantially reduced. It has been suggested that the user of an electric dry shaver wet his face before starting to shave. Unfortunately, water or other liquids used for this purpose dry quickly and any advantage thus disappears before the shaving operation is hardly started. Consequently, it would be desirable to provide an electric dry shaver with means for dispensing some sort of glide or friction reducing agent to the face of the user continuously or as desired during the shaving operation.

Accordingly, it is an object of the present invention to provide an electric dry shaver with means for dispensing liquid at the cutting head during the shaving operation.

It is another object of the present invention to provide an electric dry shaver having a reservoir for a suitable glide agent preferably in the form of a liquid under pressure which can be automatically dispensed at the will of the user at the cutting surface during the shaving operation.

Yet another object of the present invention resides in the provision of an electric dry shaver with a built-in reservoir for a glide agent with ready means to refill such reservoir from a suitable source of liquid under pressure.

Still another object of the present invention resides in an electric dry shaver having a reservoir for containing a glide agent to be dispensed at the cutting head at the will of the user, which reservoir does not substantially increase the size of the electric dry shaver and which reservoir may readily be recharged or refilled with a minimum of delay.

Further objects and advantages of the present invention will become apparent as the following description pro-

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ceeds and the features of novelty 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 a perspective view of an electric dry shaver of the reciprocating type illustrating one modification of the present invention;

FIG. 2 is an enlarged sectional view taken substantially along line 2-2 of FIG. 1;

FIG. 3 is a sectional view taken substantially along line 3-3 of FIG. 2, assuming that FIG. 2 shows the complete structure;

FIG. 4 is an enlarged fragmentary sectional view taken on line 4-4 of FIG. 3;

FIG. 5 is an enlarged fragmentary perspective view of a portion of FIGS. 1, 2 and 3 to illustrate a detail of the present invention;

FIG. 6 is a somewhat enlarged sectional view taken on line 6-6 of FIG. 5;

FIG. 7 is an enlarged sectional fragmentary view taken on line 7-7 of FIG. 2 assuming that FIG. 2 shows the complete structure;

FIG. 8 is a fragmentary sectional view taken on line 8-8 of FIG. 7;

FIG. 9 is an elevational view illustrating another modification of the present invention applied to an electric dry shaver of the type having an oscillating cutter instead of a reciprocating cutter;

FIG. 10 is an enlarged fragmentary sectional view of a portion of FIG. 9 taken substantially longitudinally through the cutting head thereof;

FIG. 11 is a sectional view taken on line 11-11 of FIG. 10, assuming that FIG. 10 shows the complete structure;

FIG. 12 is a top plan view, with certain portions cut away, of an oscillating type electric dry shaver illustrating still another modification of the present invention; and

FIG. 13 is a sectional view taken on line 13-13 of FIG. 12.

Briefly, the present invention is concerned with providing electric dry shavers, regardless of whether the shaver is of the reciprocating, oscillating or rotary type, with apparatus for dispensing a suitable glide agent at the cutting surface thereof. Any liquid that provides a slippery condition between the shaving head and the face could be satisfactory. For a reciprocating type shaver the liquid is dispensed from between the head of a multi-head shaver toward the face of the user. For an oscillating type shaver the liquid is dispensed to the outside of the comb through the holes in the comb or against the inside surface of the comb where it is picked up and distributed by the blades or through tubes directly against the skin through openings provided in the comb. The fluid flow may be controlled by various means such as an On-Off valve, a variable flow control means, or a metering device which delivers a known quantity each time the metering device is actuated. Moreover, automatic flow control means may be employed, such as by actuating the valve in response to pressure on a roller associated with the shaver. The liquid may be stored in reservoirs under pressure, such as an aerosol type reservoir, or it may be stored with pump means for discharging the same. Additionally, a gas under pressure, such as a CO₂ capsule, may be used to force the liquid from the reservoir to the shaving head. Also, a remote reservoir may be employed, which remote reservoir may be under pressure or may be elevated so that a gravity head is utilized.

Referring now to FIGS. 1 to 8 of the drawings, there is illustrated an embodiment of the present invention as

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applied to a reciprocating type shaver. As there illustrated, an electric dry shaver, generally indicated at 20, is provided which may be substantially identical to the reciprocating shaver disclosed in copending Jepson application Serial No. 848,102, filed October 22, 1959, now Patent No. 3,090,119, assigned to the same assignee as the instant application. As in the above-mentioned Jepson patent, the shaver 20 comprises a casing, generally designated at 21, having attached thereto one or more cutting units specifically illustrated as a multiple shaver head 22 extending almost completely across one of the longer dimensions of the generally rectangular housing or casing 21. As illustrated, the head 22 is a multiple cutting head comprising generally identical cutting units designated in FIG. 2 of the drawings as 22a, 22b and 22c, joined together to form the cutting head 22. Each cutting unit comprises a stationary comb 13 and a reciprocally movable cutter 14. The multiple cutting head 22 comprising the substantially identical individual units 22a, 22b and 22c is arranged as a unitary structure presenting a large cutting surface of somewhat convex configuration, which head may be removed as a unit. This is accomplished by virtue of the comb bracket 25 to which the individual cutting units 22a, 22b and 22c are secured. The cutting head 22 including comb bracket 25 are preferably identical to that disclosed in the above-mentioned Jepson patent.

In view of the somewhat arcuate nature of the comb bracket 25, the space between the combs adjacent the upper cutting surface is greater than the space adjacent the comb bracket. Preferably the space between the cutting heads 22a and 22b and the space between cutting heads 22b and 22c is filled by a suitable comb spacer designated as 27. As best shown in FIG. 5 of the drawings, the comb spacer 27 comprises a U-shaped member having curved flanges 27a and 27b at the ends of the legs of the U-shaped member, which flanges provide curved spacing members between the combs, as best shown in FIG. 2 of the drawings. The comb spacer 27 is secured to the bracket 25 by the same means securing cutting unit 22b thereto.

In order to cause the cutters 14 of the three cutting heads to reciprocate relative to the stationary combs 13, there is provided within the casing 21 a suitable prime mover in the form of an electric motor, generally designated at 28, which motor is preferably identical with that disclosed in the above-mentioned Jepson patent. This motor 28 is illustrated as of the so-called impulse type and no further description thereof is included herein. The motor includes a rotor connected to drive a shaft 30 supporting eccentric 31. As in the above-mentioned Jepson patent, the motor 28 is suitably secured within a motor chamber 33 defined in the casing 21, which chamber is below a ledge 21a integrally formed with the casing 21. The casing 21, moreover, includes integral upwardly extending wall portions 21b disposed above ledge 21a defining a cutting chamber 34 therebetween for receiving cutting head 22. The ledge 21a defines the periphery of an opening 32 interconnecting the motor chamber 33 and cutting chamber 34.

For the purpose of drivingly relating the motor 28 and the reciprocating cutters 14, there is provided an oscillating arm or bell crank, generally designated at 35, which is pivotally mounted as indicated at 36 to the field structure of the motor 28. One end of the oscillating arm is drivingly connected to the eccentric 31 in the manner fully disclosed in the above-mentioned Jepson patent. The other end of the oscillating arm 35 is provided with a plurality of driving arms designated as 35a, 35b and 35c which extend into the cutter chamber 34 through the opening 32 and drivingly engage the respective cutter 14 of the cutting units 22a, 22b and 22c, respectively, in a manner well understood by those skilled in the art. Suitable sealing means are provided, generally designated at

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38, through which the arms 35a, 35b and 35c project, which sealing means prevent hair clippings from entering the motor chamber 34 through opening 32. The sealing means and the associated means for holding the sealing means in position and for simultaneously securing the multiple cutting head 22 in cutting position forms no part of the present invention and may be identical with that disclosed in the above-mentioned Jepson patent.

For the purpose of dispensing a suitable glide agent at the cutting surface of the cutting head 22, there is provided, in accordance with the present invention, a casing extension 40 which defines a reservoir 41 therein for containing a suitable material such as a liquid or the like which may be dispensed at will at the cutting surface of the shaver 20. The casing extension 40 is preferably designated so as to be readily secured to the lower end of the casing 21, as is best shown in FIG. 1 of the drawings. It is important that the casing extension 40 does not substantially increase the size of the shaver. Suitable fastening means, such as 42, are provided to relate the shaver casing 21 and the casing extension 40 as a unitary structure. It should be understood that instead of defining the reservoir 41 within the casing extension 40 it could be formed within casing 21. Moreover, casing extension 40 might be made readily removable from casing 21 so that the reservoir 41 is associated with the shaver 20 only when liquid is to be dispensed at the cutting surface of the multiple cutting head 22. It should be understood that the present invention contemplates either a removable reservoir or a reservoir built as an integral part of the shaver. An important feature of the invention, however, is a reservoir of such size that it will not materially increase the size of the shaving implement and hence will not interfere with the ease of operation. The reservoir 41 is preferably a fluid-tight chamber in which the glide agent may be stored, preferably under pressure, for release at the shaving head, as described hereinafter.

The particular fluid or liquid stored in the reservoir 41 may vary widely, and any liquid that provides a slippery condition between the shaving head and the surface of the body being shaved, such as the face, is satisfactory. The liquid is to be applied during the shaving operation and hence does not remain on the face long enough to produce any conditioning of the beard. Consequently, the liquid need not have any long-term lubricating characteristics. The liquid, for example, may comprise the material disclosed and claimed in a copending application of Frederick Morawetz and Frederick D. Timmons, Jr., Serial No. 181,777, filed March 22, 1962 (now abandoned) and assigned to the same assignee as the present application. Actually, liquids comprising alcohol type shaving lotions, plain soap and water, hand lotions, as well as aerosol type shaving soaps have been found to work satisfactorily. The principal objection to using a soapy type of liquid is that it tends to become too frothy. It is contemplated by the present invention to cover any material which reduces the friction between the head and the face and which is generally characterized as a glide agent.

So that liquid under pressure housed in reservoir 41 may be dispensed selectively at the cutting surface of the cutting head 22, there is preferably housed within the casing 21 a suitable manifold and valve member 44 defining a manifold 45 and a valve chamber 47 interconnected by a passageway 48. The valve chamber 47 is connected to the reservoir 41 by suitable conduit 49 which preferably extends close to the bottom of reservoir 41. In accordance with the present invention the flow of fluid from reservoir 41 to valve chamber 47 is controlled by a suitable reciprocally movable valve member 51 adapted to be seated against a valve seat 52 in a conventional manner. The valve seat 52 is illustrated as defined by a shoulder in the valve chamber 47. The valve member 51 is suitably connected to one end of a valve actuat-

ing plunger 54, the longitudinal axis of which coincides with the longitudinal axis of the valve chamber 47. The other end of the valve plunger 54 remote from the valve member 51 projects through an opening 56 in casing 21, which opening is closed by suitable annular sealing member 58 having a central opening for the plunger 54. A suitable spring 59 normally biases the plunger 54 and, consequently, the valve member 51 to the closed position seated against valve seat 52 (FIG. 2). As illustrated, the spring 59 is a coiled compression spring concentric with the plunger 54, one end of which engages an enlargement 54a on the plunger 54, while the other end engages a shoulder 60 defined in the valve chamber 47. A suitable O-ring seal 61 prevents any fluid which is permitted to enter the valve chamber 47 upon opening movement of the valve member 51 from passing into the portion of the valve chamber 47 housing the spring 59.

To make it easy for the user of the electric dry shaver 20 to actuate the liquid dispensing valve comprising valve member 51, there is provided a valve actuating lever 62 pivotally mounted as indicated at 63 to projecting ears 21c of the shaver casing 21. The free end of the lever 62, as best shown in FIG. 2 of the drawings, engages the projecting end of the plunger 54. This lever 62 preferably extends across the entire shaver casing 21 so that the user of the shaver may readily engage it with his thumb or fingers to actuate the liquid dispensing valve.

In accordance with the embodiment of the present invention illustrated in FIGS. 1 to 8 of the drawings, fluid under pressure supplied to the manifold chamber 45 upon actuation of the valve member 51 is supplied to dispensing conduits 64a and 64b which are preferably disposed immediately beneath the curved portions 27a and 27b of the comb spacer 27, as best shown in FIGS. 5 and 6 of the drawings. The dispensing conduits 64a and 64b, as well as the curved portions 27a and 27b of the conduit members 27 are provided with suitable aligned openings 66 so that fluid under pressure supplied to the conduits 64a and 64b will be supplied through these openings to the face of the user. The dispensing conduits 64a and 64b are preferably secured as by spot welding or the like in the position indicated in FIGS. 5 and 6 of the drawings.

For the purpose of supplying the fluid from the manifold 45 to the dispensing conduits 64a and 64b, there are provided conduits 67a and 67b which are connected at one common end thereof to the manifold 45 by connecting means 68a and 68b, respectively. The other ends of the conduits 67a and 67b are connected to the dispensing conduits 64a and 64b either directly or through intermediate conduits, such as conduits 69a and 69b, respectively. Preferably the conduits 69a and 69b are formed of metal and are suitably spot welded or otherwise secured to the associated dispensing conduits 64a and 64b, respectively, and suitable openings, designated as 70, interconnect the respective conduit 69a or 69b with its associated dispensing conduit 64a or 64b, as the case may be, in the manner clearly indicated in FIG. 6 of the drawings. If intermediate conduits such as 67a are employed, as is illustrated in FIGS. 2 and 3 of the drawings, then these conduits 67a and 67b may be formed of plastic tubing or the like and connected to the conduits 69a and 69b, respectively, by a sleeve joint, as clearly indicated in FIGS. 2 and 3 of the drawings.

The reservoir 41 has been illustrated as a very small reservoir which will not appreciably increase the size of the shaver 20. It will be appreciated that means must be provided for periodically filling the reservoir with the desired fluid from a larger container of some sort. Since with the arrangement disclosed it is contemplated that a fluid under pressure is employed, the reservoir 41 is illustrated as being provided with a suitable filler valve mechanism (FIGS. 2, 7 and 8), generally designated as 73 through which fluid under pressure may be supplied but which will prevent such fluid from escaping once it is supplied through this valve mechanism. As best shown

in FIGS. 7 and 8 of the drawings, the filler valve mechanism 73 is disposed at one end of the reservoir 41, and to afford a connection between the valve mechanism 73 and the exterior of reservoir 41 a suitable opening 74 is provided in the casing extension 40. As illustrated, the valve mechanism 73 includes a tubular molded plastic member 75 open at both ends with an integral flange 75a at one end. The flange 75a is provided on the side thereof, opposite that from which the tubular portion projects, with an annular rib 75b. To define a suitable valve seat, there is provided an annular resilient washer 77 having a small central opening 78 aligned with the opening 74. This washer 77 is clamped between the flange 75a and the end wall of casing extension 40. As illustrated, another gasket 79 is provided on the opposite side of the flange 75a from that where the valve seat defined by washer 77 is located, and suitable means 80 are provided to clamp the valve mechanism 73 in the position best shown in FIG. 7 of the drawings. Cooperating with the washer 77 and normally closing the opening 78 therein is a valve member 82 continually biased to the closed position by a suitable compression spring 83 housed within tubular member 75. Preferably valve member 82 has an annular valve seating surface 82a of larger diameter than either the opening 78 in washer 77 or the opening 74 in casing extension 40.

When it is desired to fill reservoir 41 with a suitable glide agent, a suitable rigid conduit associated with the source of fluid under pressure (not shown) is inserted through the aligned openings 74 and 78 to bias the valve member 82 away from the washer 77, whereupon the fluid under pressure from the source is supplied to the reservoir 41 until the pressures are equalized. Withdrawal of the rigid conduit from the openings 74 and 78 will, of course, permit the spring 83 to bias valve member 82 to the closed position illustrated.

It will be appreciated that with the liquid dispensing means associated with the shaver 20, as described above, some excess liquid may appear on the outside of casing 21. The conventional dry shaver, such as 20, is commonly provided with a starting wheel protruding through an opening in the casing. It will be appreciated that with the conventional starting wheel disclosed in the above-mentioned Jepson patent, when the starting wheel is actuated it is depressed, which, of course, results in the opening in the casing being increased in size and permitting any liquid on the outside of casing 21 to enter therein. The starting wheel mechanism of the present invention, generally designated at 85, is one in which no change in size of the opening occurs upon actuating of the starting wheel and, in fact, a sealed construction against the entrance of moisture is provided. Referring now to FIG. 4 of the drawings, the starting wheel mechanism 85 comprises a sleeve 86 rigidly supported within an opening 87 defined in the casing 21. Rotatably and axially mounted within the sleeve 86 is a shaft 88. Secured to the inner end of the shaft 88 within the casing 21 is a friction wheel 89 which is adapted to engage the armature of the motor 28 in a well understood manner to cause it to rotate slightly for starting purposes. Secured to the end of the shaft 88 projecting outside of the housing or casing 21 is an actuating wheel 90. This actuating wheel 90 is provided with a recess on the underside thereof designated as 91. A suitable compression spring 92 concentric with the shaft 88 has one end disposed in the recess and the other end engaging with a shoulder 93 defined on the casing 21. An O-ring or other suitable sealing member 94 is provided within the sleeve 86 to make sealing engagement with the shaft 88. From the above description it will be apparent that the starting wheel mechanism 85 provides a sealed arrangement for preventing liquid from entering the casing 21 through opening 87. When it is desired to start the motor, the operator depresses and rotates starting wheel 90, which causes the friction wheel 89 to engage and rotate the armature of the motor 28, with the resultant starting of such motor.

In view of the detailed description included above, the operation of the arrangement disclosed in FIGS. 1 to 8 of the drawings will readily be understood by those skilled in the art. When it is desired to dispense a suitable glide agent at the cutting surface of the shaver, the operator actuates the lever 62 and the liquid is dispensed through the openings 66 against the face of the user. The openings 66 may cause the liquid to be dispensed directly against the face, in other words, with the stream of liquid being directed perpendicularly to the surface over which the shaver is moving or it could be directed at an angle. As illustrated in FIGS. 5 and 6 of the drawings, one set of openings may direct the liquid directly against the face of the user while other openings direct the liquid at an angle.

Although the control of the liquid flow has been illustrated as by a manual On-Off valve comprising valve member 51, it should be understood that variable flow control means might be employed or a metering valve might be employed which delivers a known quantity of liquid each time the valve is actuated. Obviously, however, automatic regulation of the liquid flow might be employed and the electric shaver 20 is illustrated as comprising the usual rollers 95 at the extreme edges of the cutting head 22, which may be depressible in accordance with the arrangement disclosed in the above-mentioned Jepson patent. If it is desired, the depression of one or both of these rollers 95 may be utilized to actuate a suitable liquid dispensing valve and the amount of liquid dispensed may be controlled by the pressure applied to the cutting surface causing actuation of these rollers. It will be understood, of course, that the motor 28 might be utilized to actuate a suitable pump so that whenever the motor is energized a predetermined amount of liquid would be supplied at the openings 66 by virtue of such pump.

In the arrangement described above the glide agent to be dispensed is stored in a reservoir associated with the shaver itself. It should be understood that the glide agent may be stored in a separate container connected to the shaver at the desired time by suitable conduit means. Such an arrangement is disclosed in FIGS. 9 to 11 of the drawings and described hereinafter. Furthermore, instead of storing the liquid under pressure in the reservoir 41 or a separate reservoir connected to the shaver at the desired time, the liquid may be inserted in such reservoir and then a charged gas, such as a CO₂ capsule, may be used to furnish the desired pressure for forcing the liquid to the shaving head. If desired, the charged gas, instead of forcing the liquid to the shaving head, may be used in an aspirating type arrangement to draw the liquid to the shaving head in a manner well understood by those skilled in the art. It should also be understood that the reservoir may be elevated so that fluid flow to the shaver is by virtue of gravity.

Referring now to FIGS. 9 to 11 of the drawings, there is illustrated a modification of the present invention where the liquid dispensing means is associated with a shaver of the oscillating type. As there illustrated, there is disclosed an electric shaver 96 which, except for the addition of the liquid dispensing means, may otherwise be identical with the shaver disclosed in copending Jepson and Schuessler application Serial No. 109,551, filed May 12, 1961, which has matured into Patent No. 3,176,392, granted July 27, 1965, and assigned to the same assignee as the present application. As disclosed in the above-mentioned Jepson and Schuessler application, the shaver 96 comprises a casing 97 housing a suitable electric motor (not shown). The casing 97 comprises a cup-shaped member 97a and end caps 97b and 97c. Between the end caps 97b and 97c is a cutting head generally indicated at 98. This cutting head comprises an oscillating shaft 99 journaled in suitable bearings forming a part of the cutting head 98 and fully described in the aforementioned Jepson and Schuessler application. The oscillating shaft

99 is suitably connected by driving means generally designated at 100, comprising a conventional connecting rod, crank arms, etc., with the electric motor housed in casing 97. Rigidly supported from the oscillating cutter shaft 98 are a plurality of blade supporting members 101a, 101b, 101c and 101d which are provided with suitable aligned slots for supporting a plurality of blades 102, specifically designated as 102a, 102b and 102c. These blades are oscillated in shearing engagement with a suitable perforated comb generally designated at 103, the comb being of arcuate configuration and secured to the casing by suitable comb locks 104 and 105. Suitable spring means 106 bias the cutting blades 102 against the comb 103 and the hair to be cut enters perforations in this comb and is sheared by the blades 102. In accordance with the present invention, the oscillating cutter shaft 99 is provided at one end with a tubular extension 99a extending through an opening 108 in end cap 97b. Moreover, the cutter shaft is provided with a bore 109 within the tubular extension and extending at least beyond the center of this shaft, as best shown in FIG. 10 of the drawings. A suitable sleeve 110 and a sealing gasket 111 preferably surround a portion of the projecting extension 99a of the oscillating shaft 99. The tubular extension may readily be connected with a conduit 113 to a source of glide agent under pressure indicated generally at 114. It will be understood that the source 114 may be one of the well-known aerosol type dispensers which upon depression of the member 115 at the upper end thereof will cause liquid to be dispensed under pressure through the conduit 113 and to the hollow bore 109 within the oscillating shaft 99.

In order that liquid supplied under pressure to the bore 109 in the oscillating shaft 99 may be dispensed at the cutting surface, a pair of dispensing tubes 116a and 116b are provided which are supported for oscillation with the shaft 99 and are connected to the bore 109. These dispensing tubes 116a and 116b preferably terminate closely adjacent the inside surface of the comb 103 and preferably adjacent elongated openings 117 defined in the comb so that the liquid is dispensed against the face of the user, for example, through these openings. In FIG. 9 of the drawings a suitable power cord 118 is illustrated as connecting the shaver 96 to a suitable source of electric power, such as the conventional electric outlet, generally designated as 119. It will be appreciated that the flexible tube 113 and the power cord will permit the user to use the shaver in any desired manner. If desired, the container 114 may be a container disposed at an elevation such that the hydraulic head will cause the liquid to be supplied to the shaver. In such case, a suitable valve adjacent the shaver would be provided to control the flow of liquid to the dispensing tubes 116a and 116b. It will be appreciated that the shaver 96 could be modified in the manner of the shaver illustrated in FIGS. 1 to 8 of the drawings so as to have a built-in reservoir and a control valve for supplying the liquid to the hollow oscillating shaft 99. In such case the extension 99a would terminate inside the casing 97 and connection through a flexible tubular member with a reservoir within the shaver could readily be accomplished.

In FIGS. 12 and 13 of the drawings there is illustrated another embodiment of the present invention wherein liquid dispensing means are associated with an oscillating shaver which, again, may be identical with that disclosed in the above-mentioned Jepson and Schuessler application, and the shaver is generally designated by the same reference numeral 96. The corresponding parts of FIGS. 12 and 13 are designated by the same reference numerals as in FIGS. 9 to 11. Instead of supplying the liquid through the hollow oscillating shaft, a plurality of liquid dispensing tubes specifically designated as 120a, 120b, 120c and 120d, are secured in spaced relationship to the inside surface of the comb 103, each of these tubes being curved to conform to the comb shape, as best

shown in FIG. 13. It will be appreciated that the blades 102 must be provided with suitable notches so as not to interfere with the dispensing tubes. As illustrated in FIGS. 12 and 13 of the drawings, the dispensing tubes are disposed at portions of the comb where no openings are provided, and then suitable dispensing openings 121 are provided through both the comb 103 and the walls of tubes such as 120a, 120b, 120c and 120d. In the specific embodiment illustrated in FIGS. 12 and 13 of the drawings, four dispensing tubes are provided, although fewer than that number may be utilized, as desired. As illustrated, the dispensing tubes extend through openings 122 in comb lock 105 and are connected by tubes 123 with a manifold 127, which in turn may be connected by the tube 113 to a source of fluid under pressure, such as 114 shown in FIG. 9 of the drawings. It will be appreciated that the dispensing tubes could be connected to a reservoir built into the shaver casing 97 rather than connected to an exterior reservoir, in which case the openings 122 in comb locks 105 are unnecessary.

In view of the detailed description included above, it is apparent that there has been provided an arrangement in which a suitable glide agent is dispensed at the cutting surface of an electric dry shaver. Although the application of the present invention to a rotary type dry shaver has not been illustrated, it will be understood by those skilled in the art that the present invention could equally well be applied thereto by supplying the fluid through a hollow shaft or the like.

While there have been illustrated and described several embodiments of the present invention, it will be apparent to those skilled in the art that numerous changes and modifications will occur, and 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. A shaver comprising a casing, a prime mover mounted in said casing, a cutting head secured to said

casing comprising a comb bracket, three combs disposed in spaced parallel relationship and secured to said bracket, a U-shaped comb spacer having curved flanges at the ends of the U one disposed on either side of the center comb, a plurality of cutters reciprocally movable in shearing engagement with each of said combs, means drivingly relating said cutters and said prime mover, and means secured to said spacer for dispensing a glide agent at the cutting surface of said cutting head, said last-mentioned means comprising a pair of conduits one disposed directly beneath each of said curved flanges.

2. In a shaver of the type including a casing and a prime mover mounted in said casing, the combination of a cutting head secured to said casing and including a plurality of spaced combs defining a gap between adjacent combs, a perforated comb spacer in said gap between adjacent combs and including a curved portion, a plurality of cutters movable in shearing engagement with said combs, means drivingly relating said cutters and the prime mover, and a conduit disposed beneath said curved portion of said spacer, said conduit including openings communicating with perforations in said spacer for dispensing a glide agent at the cutting surface of said cutting head.

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