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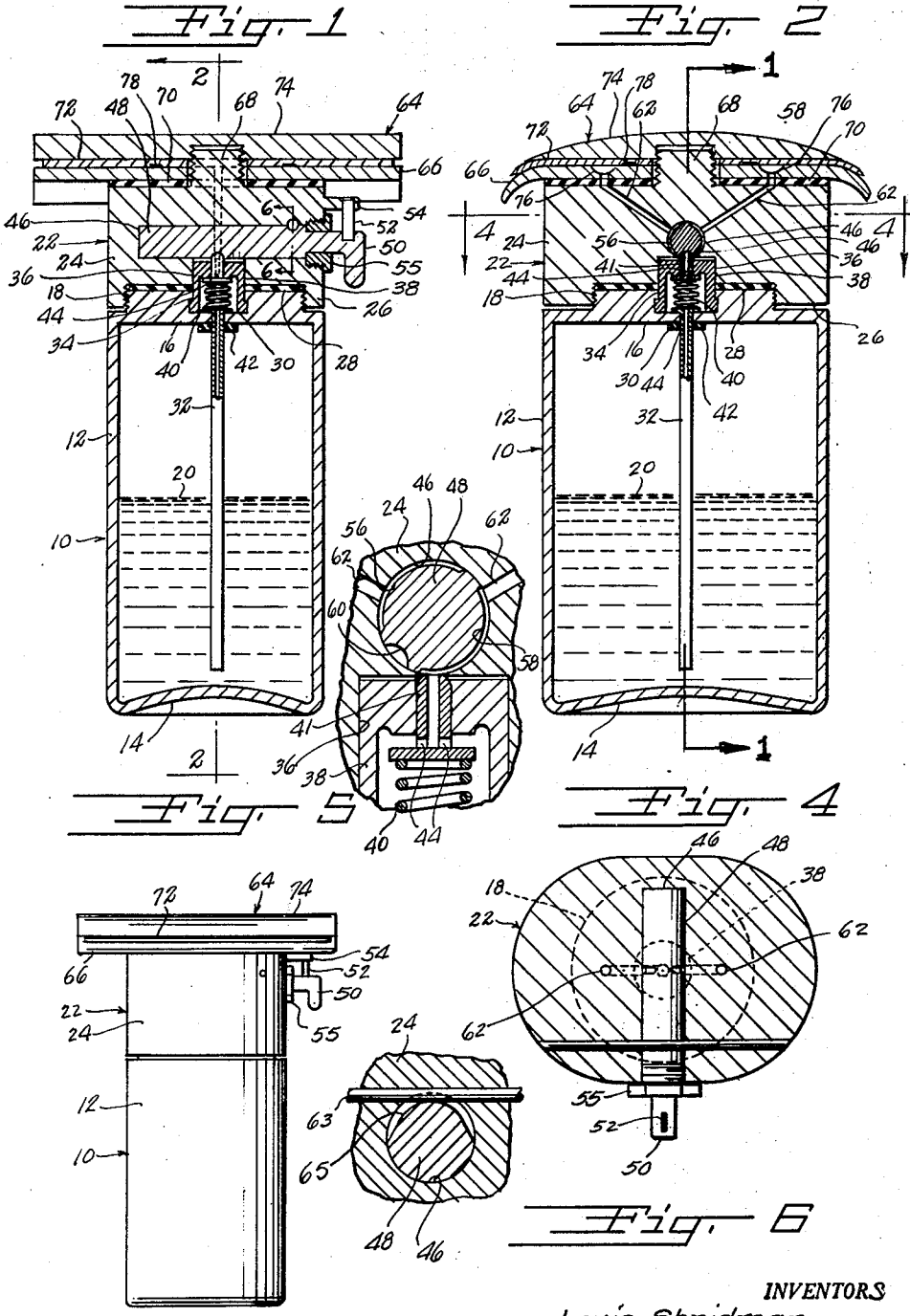
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RESERVOIR SAFETY RAZOR

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2 Sheets-Sheet 1



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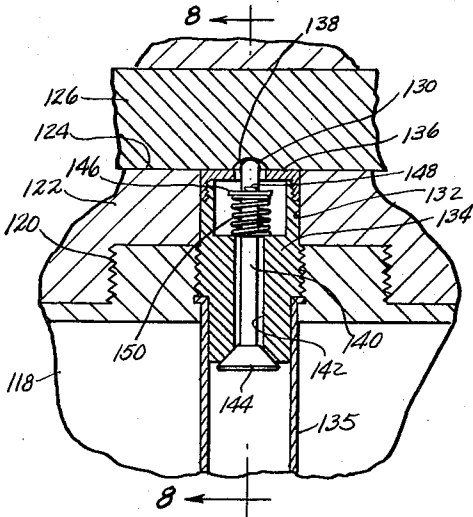


Fig. 7

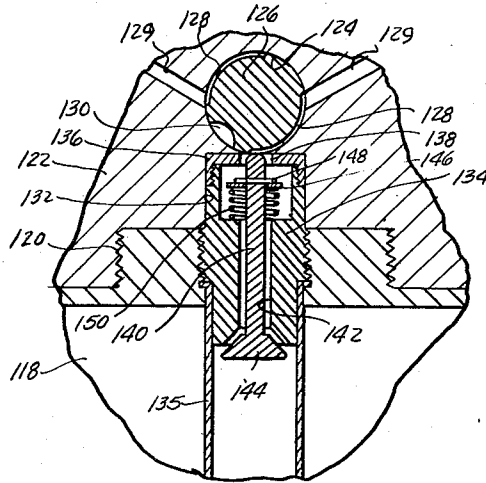


Fig. 8

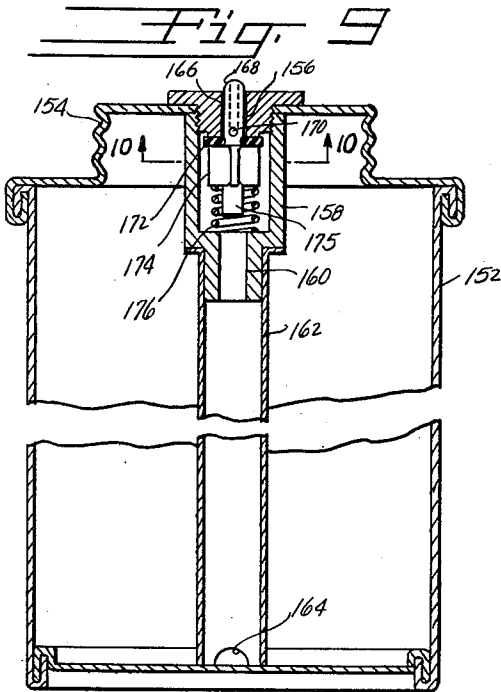


Fig. 9

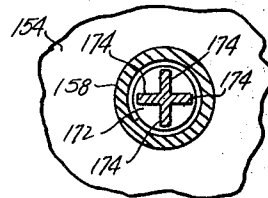


Fig. 10

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RESERVOIR SAFETY RAZOR

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4 Claims. (Cl. 30—41)

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This invention relates to razors, and more particularly, has reference to a razor of the safety type, with either single or multiple edges in which is incorporated a reservoir for shaving lubricant and a means for forcing and controlling the quantity of said lubricant to the shaving head of the razor ahead of the blade edge, whenever and as desired.

The main object of the present invention is to provide a shaving device in which will be incorporated a safety razor head having the usual replaceable blade; a reservoir formed as a handle and adapted to contain a quantity of shaving lubricant under pressure; and a valve block controllable by a user in such a manner as to release a quantity of said lubricant for passage through the head in advance of the blade edge to the hair and skin of said user. It is thus proposed to provide a shaving device which will cause all the necessary shaving equipment to be incorporated in a single compact unit, thus eliminating the requirement of keeping separately a razor, shaving cream, brush, etc.

The design of the razor unit is such that shaving lubricant is fed under the blade in advance of the cutting edge, so that as one shaves in the normal manner, the shaving lubricant is applied and comes in contact with the hair and/or skin just in advance and prior to the cutting edge, which edge cuts or shaves the hair, and leaves no shaving lubricant or hair behind, and as such is collected in a provided for groove in the razor head.

A further object of importance is to provide a shaving device as stated which will be ready for immediate use at all times, without the necessity of special preparation thereof.

Still another object is to provide a shaving device as described in which, in at least one form of the device, means will be incorporated for discharging the shaving lubricant to either side of the blade, as desired.

Still another object is to so dispose the valve control means whereby discharge of the shaving lubricant is effective to permit said valve control means to be operated by the user while said user has his hand disposed in a natural position upon the handle of the razor.

A further object of importance is to provide a shaving device of the type stated in which the shaving lubricant reservoir is readily detachable from the remaining portions of the device, thus to permit said reservoir to be sold as a separate article, to be substituted whenever necessary.

A further object is to provide a shaving device as described that will be capable of manufacture at relatively low cost, will be simple and light in design, and will provide an attractive, readily saleable article that will be highly useful to a purchaser.

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Other objects will appear from the following description, the claims appended thereto, and from the annexed drawings, in which like reference characters designate like parts throughout the several views, and wherein:

Figure 1 is a longitudinal sectional view through one form of razor unit formed in accordance with the present invention, taken on line 1—1 of Figure 2;

Figure 2 is a longitudinal sectional view at right angles to the cutting plane of Figure 1, taken substantially on line 2—2 of Figure 1;

Figure 3 is a reduced front elevational view of the razor unit;

Figure 4 is a transverse sectional view taken substantially on line 4—4 of Figure 2;

Figure 5 is an enlarged, fragmentary sectional view in the cutting plane of Figure 2, showing the valve assembly;

Figure 6 is a detail sectional view on line 6—6 of Figure 1;

Figure 7 is an enlarged, fragmentary longitudinal sectional view through a second modification of the razor unit, showing a modified form in a valve assembly;

Figure 8 is a sectional view on line 8—8 of Figure 7;

Figure 9 is a longitudinal sectional view through the reservoir of another modified unit; and

Figure 10 is a sectional view on line 10—10 of Figure 9.

The form of the invention illustrated in Figures 1 to 6 inclusive will be first described, and includes a reservoir designated generally by the reference numeral 10. The reservoir 10 is formed as a hollow, relatively elongated container which, in the illustrated embodiment of the invention, is of oblong cross sectional shape. It will be understood, however, that the particular cross sectional shape or length of the reservoir can be varied as desired.

The size and shape of the razor unit and more particularly the reservoir is such so that it can be grasped more firmly and conveniently by the hand and thereby result in a safer shave with reduced possibility of cutting the skin.

The reservoir 10, as shown in Figure 1, is formed with a side wall 12, said side wall being integral or otherwise made rigid at its lower end with a bottom wall 14. The bottom wall 14 in the present instance is of concavo convex formation, but can be flat if desired.

At its upper end, the side wall 12 is integrally formed with a top wall 16, said top wall 16 having molded thereupon a circular, relatively low, externally threaded extension 18 substantially smaller in area than the overall cross sectional area of the reservoir.

The reservoir is adapted to contain a quantity of a shaving lubricant designated by the reference numeral 20. In this connection, it is al-

ready common in the art to provide shaving lubricant in sealed containers, with the lubricant being maintained under gas pressure in such a manner as to cause the lubricant to be formed into a lather whenever a suitable valve is opened, and it is proposed, in accordance with the present invention, to maintain the lubricant 20 under a gas or hydraulic pressure, in this manner. Therefore, whenever a valve carried by the reservoir 10 is opened, the lubricant will be discharged under substantial pressure through the valve opening, and will, in the manner to be made presently apparent, be forced through the shaving head so as to be spread by the shaving head over the user's hair and skin.

Secured to the extension 18 of the top wall 16 is a valve block designated generally by the reference numeral 22. The valve block, like the reservoir, can be formed of molded plastic, die-cast metal, metal, or the like, and includes a body 24 corresponding in cross sectional shape and size to the cross sectional shape and size of the reservoir. The shape and size of body 24 may be varied for appearance, convenience, and use. That shown in the present Figures 1-4, is for illustration purposes only. The body 24, at its lower end, is formed with a depending peripheral flange or skirt 26 internally threaded for engagement with the threads of the extension 18, thus to permit the valve block to be detachably but fixedly connected to the reservoir. It thus becomes apparent that whenever the quantity of shaving lubricant within the reservoir is exhausted, a completely new reservoir, having a suitable amount of shaving lubricant therein, can be substituted for that which has become empty.

To prevent leakage through the threaded connection between the valve block and reservoir, a gasket 28 is provided.

Formed centrally in the top wall 16 of the reservoir 10 is a small diameter valve tube bore 30, the bore 30 communicating between the hollow interior of the reservoir and the outer surface of the top wall. A valve tube 32 is slidably mounted in the bore 30, for reciprocation in the direction of its length, along a line extending axially of the reservoir.

The valve tube 32, as shown in Figures 1 and 2, extends from a location spaced closely above the bottom wall 14, completely through the top wall 16, the outer end of the valve tube projecting into a counterbore 34 communicating with the valve tube bore 30 and being formed with a circumferential collar.

In the underside of the valve block body 24 there is formed a downwardly opening recess 36 that registers with and is in communication with the counterbore 34 of the reservoir. A plunger housing 38, of inverted cup shape, is seated in the recess 36, and extends downwardly into the counterbore 34.

A coil spring 40 is disposed in housing 38, and is engaged at one end against the collar of the tube 32, the other end of the spring exerting a continuous, yielding pressure against the lower end of a valve plunger 41, that is slidably mounted in the housing.

Means is provided to prevent leakage into the counterbore 34 about the tube 32, in the form of a sealing ring 42, secured to the tube 32.

Formed in the plunger 41 is an axial bore communicating with transverse inlet openings 44. The particular location of the openings 44 is of importance, and as will be noted from Figure 2,

said openings will be closed by the housing end wall, when the spring is free to expand. When, however, the plunger 41 is depressed, the valve inlet openings 44 will be brought into communication with the interior of the counterbore 34. Thus, the shaving lubricant, which as noted before is maintained under pressure within the reservoir, will be forced through the tube 32, counterbore 34, inlet openings 44, and will move upwardly within the axial bore of the plunger in seeking an escape.

In the valve body 24, we form a cylindrical, transversely disposed bore 46, and rotatable within said bore 46 is a valve member 48 having, at its outer end, a reduced shank integrally formed with a knob or button 50 to facilitate rotating said member. A leaf spring 52 is anchored at one end in the shank, and at its other end, is engaged between projections 54 of the body 24, said spring being so tensioned as to normally retain the valve member 48 in the position thereof shown in Figure 1, in which position it is adapted to prevent passage of the shaving lubricant out of the tube 32. The member 48 can, however, be partially rotated in opposite directions against the restraining action of the spring.

Formed in the member 48, substantially medially between the opposite ends thereof, are diametrically opposed passages 56, 58 (Figure 5) said passages being formed as grooves extending circumferentially of the valve member.

At this point, it is believed worthy of note that the valve member is held against longitudinal movement. The inner or closed end of the bore 46 serves as a means preventing movement of the plunger 48 in one direction.

To hold the member 48 against lengthwise movement in the other direction, a retaining nut 55 is provided, said nut having a centrally disposed bore of a diameter corresponding to that of the reduced shank of the plunger, said shank extending through the bore of the retaining nut. The nut is threaded into a correspondingly threaded counterbore of the valve member bore.

Also formed in the member 48, between adjacent ends of the passages 56, 58, is a small cam recess 60, said recess being adapted to receive the outer end of the plunger 41 when the plunger is in its normally closed position shown in Figure 2. When the plunger 41 extends into the cam recess 60, the inlet openings 44 will be closed by the wall of the housing 38, the spring 40 serving to retain the plunger 41 normally in this position. As an alternative to the use of cam recess 60, a flat side of valve member 48 may be employed.

When, however, the member 48 is rotated, the plunger 41 will be cammed out of the recess 60, and will be depressed to an extent sufficient to bring the inlet openings 44 into communication with the interior of the counterbore 34. At the same time, depending on the direction of rotation, the passage 56 or 58 will be brought into alignment with the open upper end of the plunger 41, thus to permit the shaving lubricant to be forced under pressure into said passages.

In the body 24 we form upwardly diverging outlet conduits 62, said conduits communicating, at their convergent ends, with the valve plunger bore 46. The conduits 62 are each so disposed as to be brought into communication with a passage, when the tongue, button or knob 50 is rotated clockwise or counterclockwise to the degree desired. As a result, the shaving cream will be forced under pressure into the selected

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passage for movement into one or the other of the outlet conduits.

To eliminate the nut 55, and adapted to be used in substitution for or in cooperation with spring 52 in holding the member 48 in a normal, neutral position, a pin 63 can be extended transversely of bore 46. The pin has a portion projecting into the bore (Figure 6) and engaged in a circumferential groove 65 extending part way about member 48.

It will be apparent that by the valve means shown, shaving lubricant can be directed to either edge of a blade, as desired. Further, depending on the extent to which the member 48 is rotated, the amount of lubricant so directed can be controlled.

The shaving head of the device has been designated generally by the reference numeral 64, and includes a bottom plate or guard 66 which can be dependingly flanged along its opposite sides as best shown in Figure 2. In this respect, the bottom plate or guard 66 is not unlike that provided upon a conventional safety razor. It will thus be appreciated that the bottom plate or guard could, if desired, be curved transversely through its entire width, rather than formed fiat through the greatest part of its width and dependingly flanged, in the manner shown in Figure 2.

The guard 66 is formed with a smooth walled center opening, through which extends an upwardly projecting, threaded stud 68 formed integrally upon the upper surface of the body 24. The guard 66 fits loosely upon the stud, as shown in Figure 1, and it is preferred that there be interposed, between said guard and the adjacent top surface of the body 24, a sealing gasket 70.

A razor blade has been designated by the reference numeral 72, and overlies a substantial part of the area of the guard 66. The blade 72 can be of the double-edged type as shown. Also the reservoir and valve block can be used with a single edge safety razor type.

Overlying the blade 72 is a cover plate 74, said cover plate having, in its underside, a threaded recess receiving the threaded stud 68. It will be noted, in this regard, that the blade 72 will have a center opening of smooth walled formation, so as to permit the blade 72 to fit loosely over the stud. Subsequently, when the cover plate 74 is applied to the stud, and is tightened thereupon, the blade 72 and the guard 66 will be securely held in position. Of course, a suitable means is employed to hold the blade, guard, and cover plate in proper alignment so far as the opposite edges thereof are concerned.

In the guard 66 we form, adjacent opposite edges of the blade, openings 76, said openings communicating with the divergent or discharge ends of the outlet conduits 62. Openings are also formed in the gasket 70, registering with the openings 76 to permit the free passage of the shaving lubricant into said openings 76. The openings 76 are flared at their upper ends, and it will be understood that the shaving lubricant is forced through grooves not shown in bottom plate 66, over the opposite faces of the blade, so as to be forced out of the shaving head underneath the blade and in advance of the blade, to be spread upon the hair and/or skin of the user just prior to the use of the razor edge during shaving. It may be noted, in this regard, that sufficient space will exist between the blade 72 and the guard 66 to permit movement of the shaving lubricant out of the shaving head.

It is also desirable that gasket means be pro-

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vided at 78, in the form of a ring surrounding the stud 68, thus to prevent movement of the shaving lubricant inwardly in the direction of the stud, and insure that all the shaving lubricant will be directed outwardly toward the opposite edges of the blade.

In use of the device shown in Figures 1 to 6 inclusive, it is merely necessary that the reservoir be grasped as a handle. The grasping of the reservoir in a natural, comfortable position of the hand will be effective to dispose the thumb or finger of the hand over the button or knob 50. Accordingly, when the razor is being used, the user, if additional shaving lubricant is desired, need only rotate clockwise or counter-clockwise the tongue or knob 50. In this way, we propose to eliminate the necessity of maintaining brushes or separate containers for shaving lubricant.

In Figures 7 and 8, a modified construction is shown, wherein a reservoir 118 has an externally threaded axial extension or boss 120 engageable in the complementarily threaded, downwardly opening recess of a valve block 122 formed with a transverse bore 124 in which a rotatable valve member 126 is mounted. Member 126 has diametrically opposed, circumferentially extending passages 128 to direct flow into one or the other of outlet conduits 129, depending on the direction in which member 126 is rotated. A cam recess 130 is formed in member 126, between passages 128.

A valve plunger housing 134 seats in an opening formed in the block 122, and is threadedly engaged in a center opening formed in boss 120. Said housing has a chamber closed by a cap 136 threaded onto the upper end of housing 134, the cap having a center opening 138 communicating with bore 124.

A valve plunger or stem 140 is mounted for movement in the direction of its length in an axial bore 142 formed in housing 134. Said axial bore is substantially greater in diameter than the diameter of the valve stem, to permit flow through the bore 142 about the stem.

As will be noted, the housing 134 holds in place a valve tube 135 extending to the bottom of the reservoir, the valve stem having a flared head 144 normally seating in a complementarily flared end portion of bore 142.

A collar 146, circumposed about the stem 140 within the chamber of housing 134, is held in place by a cross pin 148, and bearing against said collar is a spring 150 through which the stem extends.

By reason of the construction shown, it is apparent that rotation of member 126 in either direction will depress the valve stem to unseat head 144 and allow lubricant to flow through a selected passage 128 and conduit 129.

In Figures 9 and 10, a reservoir 152 has a threaded boss 154 for connection to a valve block, not shown, formed as in any of the previously described figures of the drawing. A plug 156 extends into a center opening of the boss and is threadedly engaged with the upper end of a hollow, cup-shaped housing 158 having at its lower end a reduced extension formed with an axial bore 160 communicating between a valve tube 162 and the interior of the housing. A notch 164 in the lower end of the tube allows lubricant to flow therinto from the reservoir. A similar notch would be provided in the tube 135 of Figures 7 and 8.

In the plug 156 we provide a center bore 166 in which is slidable a plunger 168 having an axial bore communicating with inlet openings 170. Be-

low openings 170 plunger 168 is grooved circumferentially to receive a sealing gasket 172 normally bearing against the plug 156.

Below the grooved part of plunger 168, we form the plunger with radial vanes 174 rigid at their lower ends with an axial projection 175, that extends into one end of a spring 176 exerting a yielding upward pressure against the plunger vanes.

It will be apparent that depression of plunger 168 will cause openings 170 to be uncovered, thereby allowing lubricant to flow upwardly through the plunger.

In all forms of the invention, the user is enabled to retain, in one compact unit, a shaving lubricant and a razor, in an arrangement which permits the user to dispense with all other items of shaving equipment, such as brushes, tubes or shaving cream, shaving soap, etc.

It is also thought to be of importance that the construction illustrated and described makes use of newly developed means for dispensing lather-type shaving cream, from a container in which the cream is held under pressure in a liquid form. Such a container is readily adapted for modification to permit the same to be connected to the valve block and shaving head shown in the several figures of the drawings, and obviously, the illustrated arrangement allows replacement of empty containers without difficulty and with minimum expense.

It is believed apparent that the invention is not necessarily confined to the specific use or uses thereof described above, since it may be utilized for any purpose to which it may be suited. Nor is the invention to be necessarily limited to the specific construction illustrated and described, since such construction is only intended to be illustrative of the principles of operation and the means presently devised to carry out said principles, it being considered that the invention comprehends any minor change in construction that may be permitted within the scope of the appended claims.

What is claimed is:

1. A reservoir safety razor comprising: a reservoir for holding shaving lubricant under pressure; a shaving head connected to the reservoir and having spaced outlet conduits for feeding lubricant to the edges of a blade carried by said head; a valve member rotatable in the head and having spaced circumferential passages, rotation of said member in one direction being adapted to bring one of said passages into communication with one of said conduits and rotation of the member in an opposite direction bringing the other passage into communication with the other conduit; and a valve plunger controlling flow of lubricant from the reservoir, said plunger being normally spring-urged to a closed position, the valve member having cam means for biasing the plunger to open position on rotation of the valve member in a selected direction, to effect flow of lubricant in selected quantity into a selected passage of the valve member.

2. A reservoir safety razor comprising: a reservoir for holding shaving lubricant under pressure; a shaving head detachably connected to the reservoir and having spaced outlet conduits for feeding lubricant to the edges of a blade carried by said head; a valve member rotatable in the head and having spaced circumferential passages, rotation of said member in one direction being adapted to bring one of said passages into communication with one of said conduits and rotation of the member in an opposite direction bring-

ing the other passage into communication with the other conduit; a valve plunger controlling flow of lubricant from the reservoir, said plunger being normally spring-urged to a closed position, the valve member having cam means for biasing the plunger to open position on rotation of the valve member in a selected direction, to effect flow of lubricant in selected quantity into a selected passage of the valve member; and pin-and-groove means interengaging between the head and valve member in a neutral, plunger-closing position.

3. A reservoir safety razor comprising: a reservoir for holding shaving lubricant under pressure; a shaving head connected to the reservoir and having spaced outlet conduits for feeding lubricant to the edges of a blade carried by said head; a valve member rotatable in the head and having spaced circumferential passages, rotation of said member in one direction being adapted to bring one of said passages into communication with one of said conduits and rotation of the member in an opposite direction bringing the other passage into communication with the other conduit; a leaf spring associated with the valve member and head, said leaf spring being tensioned to limit rotation of the valve member and normally retain the valve member in a neutral plunger-closing position; and a valve plunger controlling flow of lubricant from the reservoir, said plunger being normally spring-urged to a closed position, the valve member having cam means for biasing the plunger to open position on rotation of the valve member in a selected direction, to effect flow of lubricant in selected quantity into a selected passage of the valve member.

4. A reservoir safety razor comprising: a reservoir for holding shaving lubricant under pressure; a shaving head detachably connected to the reservoir and having spaced outlet conduits for feeding lubricant to the edges of a blade carried by said head; a valve member rotatable in the head and having spaced circumferential passages, rotation of said member in one direction being adapted to bring one of said passages into communication with one of said conduits and rotation of the member in an opposite direction bringing the other passage into communication with the other conduit; a valve plunger controlling flow of lubricant from the reservoir, said plunger being normally spring-urged to a closed position, the valve member having cam means for biasing the plunger to open position on rotation of the valve member in a selected direction, to effect flow of lubricant in selected quantity into a selected passage of the valve member; and pin-and-groove means interengaging between the head and valve member in a neutral, plunger-closing position, said valve member and valve plunger constituting a valve means associated with the head and reservoir respectively and arranged to control flow of lubricant while permitting replacement of the reservoir by a similar reservoir, on exhaustion of said quantity of lubricant.

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