Dec. 15, 1942. J. A. HANLEY 2,304,909

DRY SHAVING IMPLEMENT

Filed Oct. 23, 1941

Fig. 1

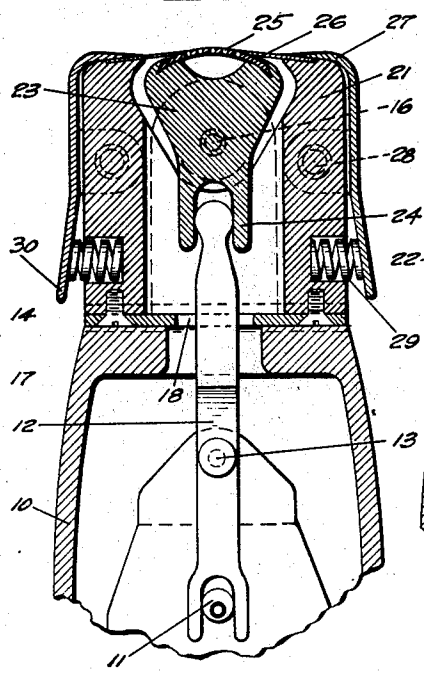
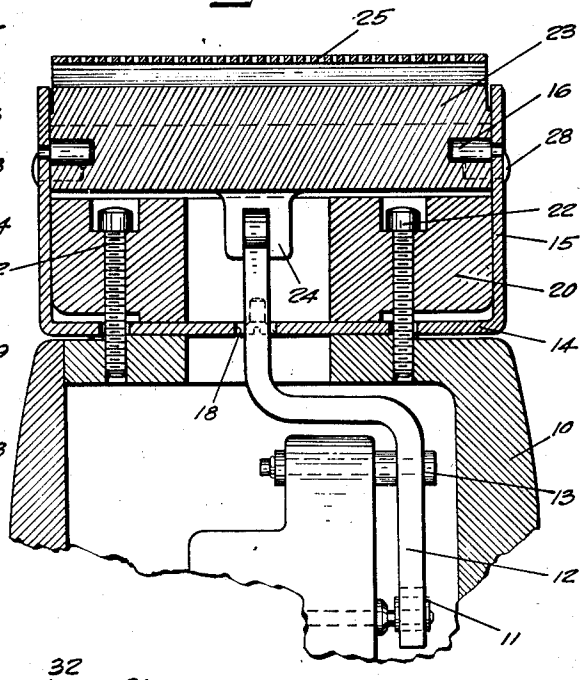


Fig. 2



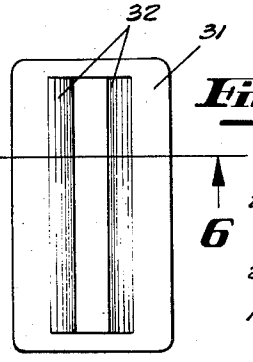
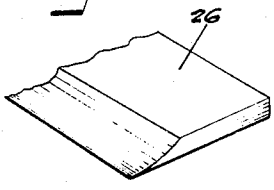


Fig. 4

Fig. 3



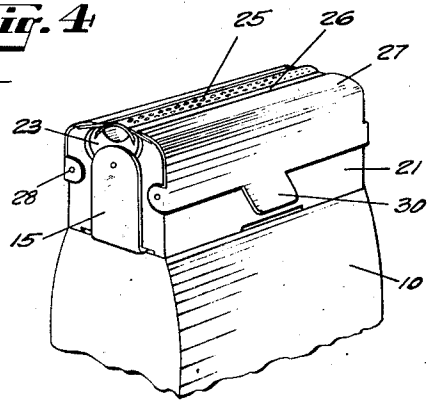


Fig. 5

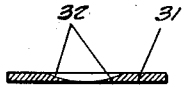


Fig. 6

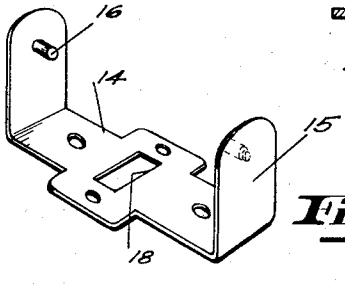


Fig. 7

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DRY SHAVING IMPLEMENT

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7 Claims. (Cl. 30—43)

This invention consists in a novel dry shaving implement characterized by a movable perforated cylindrcal segment and a co-operating stationary blade, both the segment and the blade being arranged to be contacted directly with the face of the user, and the segment being moved toward and beneath the stationary blade in effecting the shaving operation.

A shaving implement organized as above explained is capable of closer and cleaner shaving than one in which the hair must pass entirely through a toothed or perforated part to reach the shaving plane. On the contrary, in the implement of my invention shaving is effected in an area or a line which may coincide with the surface of the user's face, there being nothing between the skin and the shearing plane. The hairs are engaged in the apertures of the segment plate and thus are conveyed in supported condition to and against the sharp edge of the stationary blade. The perforations of the segment pass beneath the sharp edge of the blade and the hairs entering the perforations are sheared along the line of the blade edge which may rest without obstruction on the face of the user.

While the construction and organization above outlined is believed to be broadly novel and capable of application to power-operated, hand-operated or traction-operated shavers, the invention will be herein disclosed for purposes of illustration in its application to a power-operated dry shaver in which the perforated cylindrical segment is mounted as a separate element in a power-operated rocker member. It will be understood, of course, that within the terms of the claims the perforated segment may be supplied as part of a complete cylinder or roller in which case it may be rotated by power or by traction on the face of the user instead of being oscillated as in the illustrative embodiment of the invention herein described. All of these various embodiments of the invention, however, include the essential elements of a perforated cylindrical segment movable toward and beneath a stationary blade in effecting the shaving operation.

Other features of the invention consist in a novel rocker member with diverging arms slotted to receive a cylindrical segment by endwise movement and to securely retain it in position bridging the space between the arms of the rocker which is thus available for receiving shaving debris. The rocker itself is movable about an axis coinciding with the center of curvature of the segmental plate and in its movement about this axis carries the segment toward and beneath a stationary blade.

Another feature of the invention consists in means for detachably supporting and retaining a stationary blade with its sharp edge maintained yieldingly in contact with the perforated cylindrical segment in the proper location circumferentially thereon. While a double acting implement is herein shown in which two blades are employed and in which two shearing operations are effected in each complete oscillation of the shearing segment it will be apparent that a single blade only is needed in the construction of a complete dry shaving implement.

These and other features of the invention will be best understood and appreciated from the following description of a preferred embodiment thereof, selected for purposes of illustration and shown in the accompanying drawing, in which:

Fig. 1 is a view in cross-section through the head and upper portion of the casing of the implement;

Fig. 2 is a similar view in longitudinal section;

Fig. 3 is a fragmentary view in perspective and on an enlarged scale of the blade;

Fig. 4 is a plan view of a duplex form of knife which may be employed in the implement;

Fig. 5 is a fragmentary view in perspective of the implement, corresponding to Figs. 1 and 2 but on a smaller scale;

Fig. 6 is a view in cross-section on the line 6—6 of Fig. 4; and

Fig. 7 is a view in perspective of the base plate of the head of the implement.

As herein shown the implement includes in its structure a hollow casing 10, containing the motor, and a head 20 containing the cutting or shaving elements of the implement. The casing 10 is shaped to serve as a handle and also to enclose the operating motor. This is not shown except for its driven shaft which carries an operating eccentric 11 at one end. The eccentric 11 rotates between the forks of an operating lever 12 journalled to oscillate about the axis of a stationary shaft 13 projecting from the motor frame. The upper end of the operating lever 12 is offset and extends upwardly through an opening in the upper wall of the casing and into the head of the implement where it is connected to the movable cutter element as will be presently explained.

As herein shown the head of the implement comprises a body portion 20 of plastic material or the like having upstanding side walls 21 defining a longitudinal opening extending from end

to end of the head and roughly triangular in cross-section. To the bottom of the body of the head is secured a sheet metal base plate 14, best shown in Fig. 7. The base plate 14 has a rectangular bottom portion with laterally extending rectangular ears and upstanding end walls 15 provided with inwardly extending trunnions 16. The body of the base plate is perforated to receive screws 17 by which the plate is attached to the bottom of the body portion of the head with its upstanding end walls 15 embracing opposite faces of the head and with the trunnions 16 located in alignment with each other at opposite ends of the open space defined by the side walls 21. The base plate is also provided with a central rectangular aperture elongated crosswise of the base plate to receive with clearance the upper end of the operating lever 12. In practice the base plate 14 is assembled with the head and permanently secured thereto by the screws 17 with its central aperture 18 disposed substantially in registration with the opening in the upper wall of the casing 10. The head itself is secured in place by a pair of screws 22 which pass freely through the body 20 of the head, and base plate 14 and are threaded into the upper wall of the casing, all as shown in Fig. 2.

Within the head an elongated rocker member 23 is mounted for transverse oscillation upon the trunnions 16. The rocker member is provided with a pair of downwardly projecting ears 24 between which is engaged the rounded upper end of the operating lever 12. It is provided also with short thick upwardly diverging arms grooved to receive between them a perforated cutter plate 25 of thin sheet steel having a multiplicity of hair-receiving and supporting perforations formed in the central zone of its surface. The plate 25 has the shape of a cylindrical segment formed as an arc described about the axis of the trunnion 16 and is mounted to oscillate about an axis coincident with its center of curvature. The plate 25 is preformed and held in place by being slipped endwise into curved slots provided for it in the arms of the rocker member 23.

The side walls 21 are shouldered in their upper faces to provide blade seats for stationary blades 26 of thin sheet steel, hollow ground in the lower face of each inner edge thus providing a curved bevel and bringing the thin fine edge of the blade into engagement with the outer face of the oscillating cutter plate 25 along a line at one side of its center. Each of the stationary blades 26 is held in place by a spring clamping device comprising an angular sheet steel member 27 having a tapering flange shaped to overlie the rear portion of the blade 26. Each clamping device has angular side arms and is pivoted by these to swing about pins 28 projecting from the end walls of the body 20 of the head. They are normally urged into clamping relation by stiff compression springs 29 which are received in circular recesses in the body of the head and act normally to swing the clamps inwardly at their upper end and thus to retain the stationary blades 26 securely in place in their recesses or blade seats.

At its lower edge each clamp 27 is provided with an out-turned finger piece 30 by which the operator may retract the clamps at any time and thus release one or both of the blades 26 for replacement or cleaning. The blades may be constructed of commercial razor-blade steel in the order of .006" in thickness and so may be replaced frequently at little expense.

Instead of a pair of single-edged blades 26 I may employ a single blade plate 30 having a central rectangular slot bounded at its longitudinal edges by curved, hollow-ground bevels 31. If desired in a double-edged shaving implement the duplex blade of Fig. 4 may be employed in place of two single-edged blades 26 of the character shown in Fig. 3.

In operation, the cylindrical plate 25 is set in motion and the implement moved over the face of the user with the cylindrical plate 25 in direct contact with the face. Its function is to engage hairs within its apertures and to support or convey them in supported condition to the keen sharp edge or edges of the blades 26 where they are severed in close proximity to the face of the user. It will be noted that there is nothing lying between the curved carrier and supporting plate 25 of the shaving implement and the face of the user in the area where hairs are to be cut by cooperation with the shaving edge or edges of the stationary blades 26 or 30. The shaving debris passes in through the hair-supporting plate 25 to the space in the oscillating member between its upwardly divergent arms. The debris may accumulate therein and be eventually discharged from the implement by tilting the latter so that it will find its way out through the ends of the implement. The clamps 37 may be released at any time by pressure on the finger piece 30 against the opposition of the springs 29 and the blade removed for inspection, cleaning or renewal.

While there is considerable latitude in the shape and arrangement of the perforations in the shearing plate 25 it is important that at the point of reversal of an oscillatory plate all perforations should be fully concealed beneath one or other of the stationary blades. That is, in order to prevent pulling each perforation must pass completely beneath and beyond the keen cutting edge of the stationary blade. This condition is accurately maintained in the implement of my invention.

An important advantage incident to the construction above disclosed is that it insures a greater uniformity of shaving action for all types of beard regardless of individual differences in the nature of skin and beard conditions than has been possible heretofore. This uniformity is achieved regardless of the differences in manipulation of the implement by the individual user on the face, or differences in direction of the hair growth, because the two cutting members lie directly on the surface of the skin and no pressure against the face is required to bring the hairs into the cutting line or plane.

Having thus disclosed my invention and described certain embodiments thereof in detail, I claim as new and desire to secure by Letters Patent:

1. A dry shaving implement comprising a head having a stationary blade mounted in overhanging position with its free edge bevelled on its inner side, and a perforated cylindrical segment disposed substantially tangentially to and beneath the outer face of said stationary blade and power operated to rock toward and beneath the stationary blade to shear hairs entered in its perforations.

2. A dry shaving implement comprising a head having a perforated cylindrical segment power operated to swing about the axis of its center of

curvature, and a stationary blade having a hollow ground edge fitted to bear yieldingly against said segment.

3. A dry shaving implement comprising a head having spaced side walls, a perforated cylindrical segment pivotally mounted and power-driven for movement about an axis coinciding with its center of curvature, and a stationary blade detachably supported upon one of said side walls and bevelled upon its under face to provide a sharp edge resting directly upon the surface of said cylindrical segment.

4. A dry shaving implement comprising a power-operated cylindrical segment mounted for oscillation and provided with hair-receiving perforations, and a co-operating stationary blade structure consisting of a flat plate having a longitudinal slot therein with both exposed inner edges bevelled on a substantially continuous curve and disposed to fit and bear upon said segment.

5. A dry shaving implement comprising a head having an upstanding side wall, a sharp-edged blade mounted in stationary position thereon with its edge projecting beyond said wall, an elongated power-operated rocker member having spaced radial arms, and a cylindrical segment inserted in said arms and engaged at one side by the sharp edge of the stationary blade.

6. A dry shaving implement comprising a head having side walls and a central opening therethrough, a base plate secured to the bottom of the head and having upstanding end walls, a power-driven member journalled in said end walls to rock in said central opening, a perforated cylindrical segment carried by said member, and a thin sheet steel blade detachably clamped to one of said side walls with its edge in yielding engagement with the outer surface of said perforated segment.

7. A dry shaving implement comprising a head having side walls and a central opening extending from end to end thereof, a power-operated elongated rocker mounted in said central opening and having a pair of divergent upwardly extending arms and a downward projection, a perforated cylindrical segment interlocked with said arms and closing the space between them, and a stationary blade of thin sheet steel mounted on one of said side walls and yieldingly engaged with said cylindrical segment in a line at one side of its center.

JOHN A. HANLEY.