June 14, 1949. J. LORENZ 2,472,853

SHAVING APPARATUS

Filed March 1, 1945

Fig. 1.

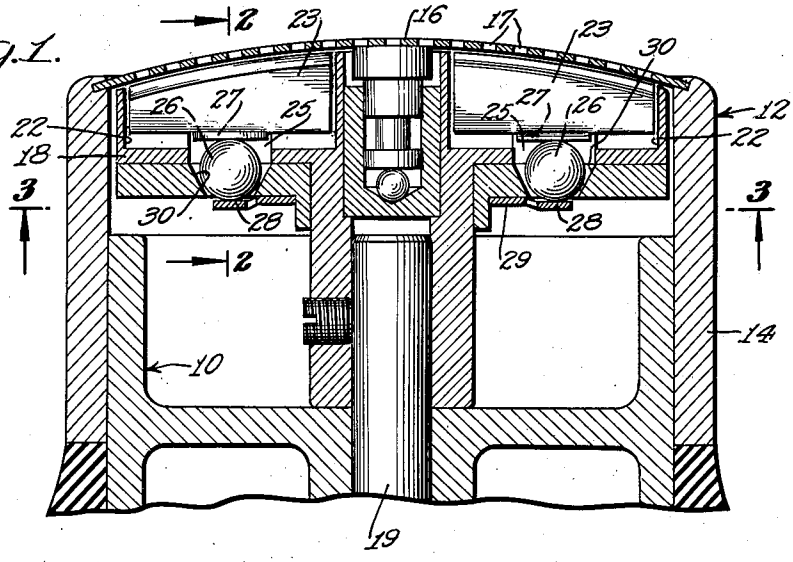


Fig. 2.

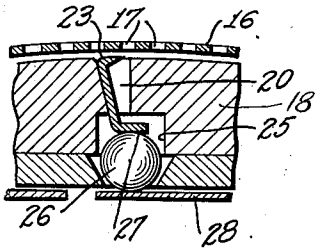
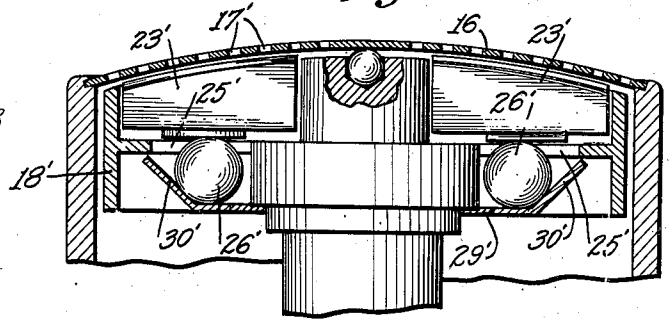


Fig. 4.



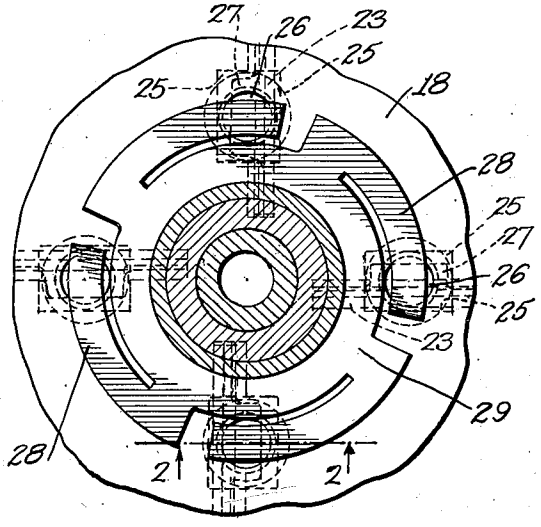


Fig. 3.

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SHAVING APPARATUS

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9 Claims. (Cl. 30—43)

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This invention relates to shaving devices, and has particular reference to the class of shaving devices known as dry shaving devices, and has been shown in connection with the rotary cutter type shown in Moskovics and Abrams Patents Nos. 2,119,021 and 2,280,836, for example.

In that type of dry shaver, a rotating cutter cooperates during operation with a perforated dome-shaped shear plate so as to sever the hairs projected through the shear plate perforations. The rotating cutter is provided with substantially radial slots including upwardly at their outer ends and containing corresponding cutter blades which respond to centrifugal force and move radially outwardly and axially upwardly along the inclined edges of the slots so as to move into intimate engagement with the under surface of the shear plate.

This construction has been found satisfactory but as close tolerances in the contours of cooperating surfaces are required, and the desired pressure of the cutter blades against the shear plate is dependent upon the weight of the blades, the objects of this invention are to provide a construction in which the movement and pressure of the cutter blade against the shear plate is produced by a separate centrifugally operated member, which engages and applies a substantial axial force to the cutter blade at a point preferably opposite its center of gravity, thereby ensuring uniform pressure against the shear plate along the entire length of the cutter blade, and which operates substantially independently of the weight of the cutter blade.

Other objects of this invention will be apparent from the following description taken in connection with the accompanying drawings, in which:

Figure 1 shows an axial section through a dry shaving device embodying the present invention;

Fig. 2 is a vertical transverse view on the line 2—2 of Fig. 1;

Fig. 3 is a horizontal section on the line 4—4 of Fig. 1; and

Fig. 4 is an axial section through a modified form of the cutter of this invention.

For purposes of disclosure, I have shown my invention as an improvement in the shaving apparatus disclosed in the patents referred to herein.

This apparatus illustrated in Fig. 1 consists of a housing 10 constituting a handle and containing an electric motor of known type and having mounted on one end thereof a shaving head 12 which consists of a tubular shell 14, preferably detachably secured by any suitable means to the end of the handle 10. Mounted in the upper end

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of the shell 14 is a dome-shaped shear plate 16 which is provided with a plurality of apertures 17 varying in size and shape according to requirements.

Positioned below the shear plate 16 is the cutter which consists of a generally cylindrical body 18 secured on the upper end of the motor shaft 19 and preferably made massive so as to act as a fly-wheel when the motor is rotating.

As best shown in Fig. 2, the outer face of the cutter body 18 is provided with angularly-spaced radial slots 20 of any desired number, such as four. The slots are of rectangular form open on the side opposite the shear plate, and terminate short of the periphery of the cutter body as indicated at 22 to receive rectangular cutter blades 23 provided with thin upper arcuate cutting edges conforming to the interior curvature of the shear plate 16 and adpated to be projected beyond the body 18 against the inner face of the shear plate. The blades are guided to move axially but are restrained against radial movement.

As shown in Fig. 3, the lower section of each slot intersects a pocket 25 having inclined walls formed in the body 18 at a point midway between the ends of the slot and of sufficient size to receive a centrifugally-operated blade-actuating ball 26. The lower edge of the cutter blade 23 is provided with a lip or bearing 27 for the ball 26. The balls may be held in the position shown in Fig. 1 by the spring arms 28 of a disc 29 secured against the inner end of the body by any suitable means and hold the blades slightly spaced from the under surface of the shear plate 16. The cutter body 18 may be made sectional as shown.

The pocket 25 is preferably located about midway of the length of the slot 20, so that the ball will engage the cutter blade at a midpoint as shown to provide uniform and coextensive pressure of the cutting edge of the blade against the under surface of the shear plate 16. The outer end 30 of the pocket 25 is inclined as shown at a suitable angle, and the weight of the ball 26 is such as to move up the incline 30 in response to centrifugal force to effect the desired upward movement of the cutter blade 23 against the shear plate 16 when the motor is running at normal operating speed.

In operation of the shaving device shown in Figs. 1, 2 and 3, the blade 23 is moved axially of the device by the ball 26 which engages the lower edge of the blade substantially at its midpoint in all positions of the ball, as the radial movement of the ball is quite small.

In the modification of the cutter head shown

in Fig. 4, the inclined surfaces 30' over which the balls 26' travel to engage and actuate the blades 23' are formed by upturned radial extensions on a sheet metal disc 29' secured under the cutter, body 18', the balls 26' being located in pockets 25' in the cutter body 18' as before. The operation of the modification of Fig. 4 is the same as that of Figs. 1, 2 and 3.

As the movement of the cutter blade is axial, the shear plate may be flat or of other preferred contour radially. The invention is applicable to cylindrical cutters movable about an axis at right angles to that of the cutter shown. It is obvious that the cutter blade may be of any shape and may be made of any weight and thickness of stock found desirable for functional operation and ease and cost of manufacture as the pressure of the cutter blade against the shear plate is a function of the weight of the ball, and the speed of rotation of the motor.

While certain preferred embodiments of the invention have been illustrated and described herein, it is to be understood that the invention is susceptible of change in form and detail within the scope of the appended claims.

I claim:

1. In a shaving device, the combination of a handle, a thin apertured skin contacting shear plate mounted on said handle, a member adjacent to the under surface of said shear plate and rotatable on an axis substantially normal thereto, a cutter blade mounted on said member for movement toward said shear plate, means for rotating said member, and separate centrifugally operated means on said member for urging said cutter blade into engagement with said shear plate as said member rotates.

2. In a shaving device, the combination of a handle, a thin apertured skin-contacting shear plate mounted on said handle, a member adjacent to the under surface of said shear plate and rotatable on an axis substantially normal thereto, said member being provided with a substantially radial slot open on its side facing said shear plate, a cutter blade supported in said slot for movement toward said shear plate, and centrifugally operated means cooperating with said member and movable relatively to said cutter blade for urging said cutter blade into engagement with said shear plate.

3. In a shaving device, the combination of a handle, a thin apertured skin-contacting shear plate mounted on said handle, a member adjacent to the under surface of said shear plate and rotatable on an axis substantially normal thereto, said member being provided with a substantially radial slot open on its side facing said shear plate and having an outwardly inclined surface, a cutter blade supported in said slot above said surface for movement toward said shear plate, and means on said surface for movement therealong relatively to said blade in response to centrifugal force for urging said blade into engagement with said shear plate.

4. In a shaving device, the combination of a handle, a thin apertured skin-contacting shear plate mounted on said handle, a member adjacent to the under surface of said shear plate and rotatable on an axis substantially normal thereto, said member being provided with a substantially radial slot open on its side facing said shear plate, a cutter blade supported in said slot for movement toward said shear plate, said member being provided with adjacent radially outwardly inclined face, and a ball engaging said face and movable therealong in response to centrifugal force for urging said blade in an axial direction into engagement with said shear plate.

5. In a shaving device, the combination of a handle, a thin apertured skin-contacting shear plate mounted on said handle, a member adjacent to the under surface of said shear plate and rotatable on an axis substantially normal thereto, said member being provided with a substantially radial slot open on its side facing said shear plate, a cutter blade supported in said slot for movement toward said shear plate, said slot having a bottom wall inclined radially outwardly toward the lower edge of said blade, and a centrifugally-operated member cooperating with said edge of said blade and said inclined wall for movement along said wall in response to centrifugal force to urge said blade into engagement with said shear plate.

6. In a shaving device, the combination of a handle, a thin apertured skin-contacting shear plate mounted on said handle, a member adjacent to the under surface of said shear plate and rotatable on an axis substantially normal thereto, and provided with a substantially radial slot open on its side facing said shear plate and provided also with a pocket intersected by said slot and having an upwardly inclined outer end wall, a cutter blade in said slot, and a ball in said pocket engaging said inclined outer end wall of said pocket for movement therealong in response to centrifugal force to urge said blade into engagement with said shear plate.

7. In a shaving device, the combination of a handle, a thin apertured skin-contacting shear plate mounted on said handle, a member adjacent to the under surface of said shear plate and rotatable on an axis substantially normal thereto, and provided with a substantially radial slot open on its side facing said shear plate and provided also with a pocket intersected by said slot and having an upwardly inclined outer end wall, a cutter blade in said slot, a ball in said pocket engaging the lower edge of said cutter blade and said inclined outer end wall of said pocket for movement along the latter in response to centrifugal force to urge said blade against the shear plate, said pocket having an opening in its bottom wall, and an exteriorly located closure member overlying said opening and adapted to be displaced to permit removal and insertion of said ball in said pocket.

8. In a shaving device, the combination of a handle, a skin-contacting shear plate mounted on said handle, a cutter blade cooperating with the under surface of said shear plate, means for moving said cutter over the surface of said shear plate, and centrifugally-operated means associated with said cutter blade and moving means and movable relatively to said cutter blade for urging the same into working contact with said shear plate as said moving means attains its working speed.

9. In a shaving device, the combination of a handle, a thin curved apertured skin-contacting shear plate formed as at least part of a surface of revolution and mounted on said handle, a member adjacent the under surface of said shear plate and movable about an axis including the center of curvature of said shear plate, said member being provided with a substantially radial slot open on its side facing said shear plate, a cutter blade mounted in said slot for movement toward said shear plate, and centrigually-operated means cooperating with said member and inde-

pendent of said cutter blade for urging said cutter blade into engagement with said shear plate in response to movement of said member.

JOHN LORENZ.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,178,976	Te Pas	Nov. 7, 1939
2,247,798	Bean	July 1, 1941
2,280,836	Moskovics	Apr. 28, 1942