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DRY SHAVER WITH FLEXIBLE SHEAR PLATE AND MEANS SUPPORTING THE SHEAR PLATE

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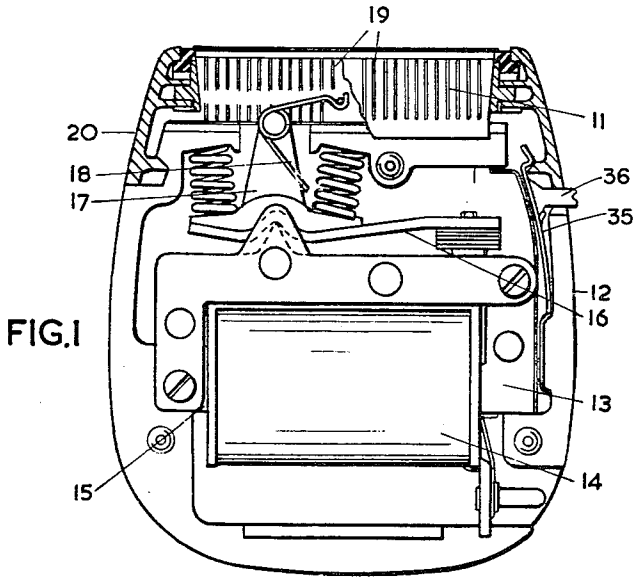


FIG.1

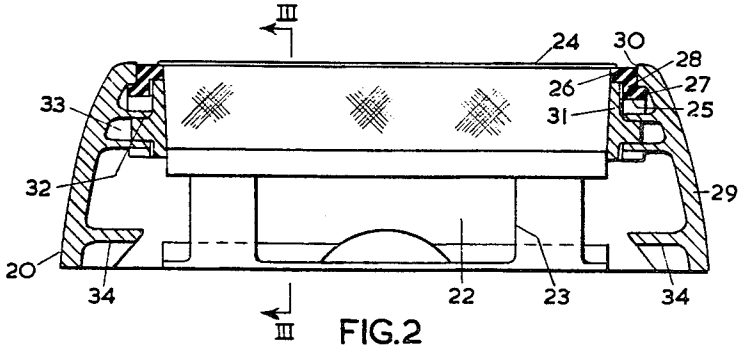


FIG.2

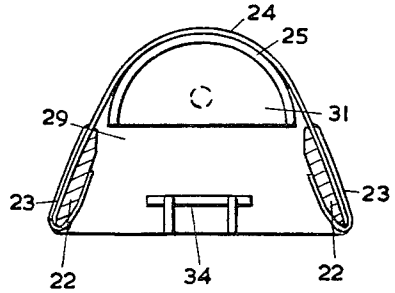


FIG.3

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DRY SHAVER WITH FLEXIBLE SHEAR PLATE AND MEANS SUPPORTING THE SHEAR PLATE

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This invention relates to dry shavers of the kind in which a moving inner cutter co-operates with a stationary outer shear plate formed by a perforated metal sheet or foil which is thin enough to be readily flexible and is secured along two opposite edges to the stationary casing of the shaver so as to be held in arched condition. To facilitate cleaning, the part of the casing to which the shear plate is secured is usually formed as a frame arranged for easy removal from the main part of the casing. The longitudinal side members of this frame serve for the attachment of the said two edges of the shear plate, while the end members of the frame are shaped to close the ends of the tunnel formed by the arched shear plate.

According to the present invention there is provided a dry shaver including a flexible outer shear plate curved about an axis extending longitudinally of an elongated inner cutter the cutting surfaces of which are resiliently urged into engagement with the concave inner surface of the shear plate, wherein resilient means spaced beyond the ends of the cutter engage the inner concave surface of the shear plate to support the same.

A dry shaver constructed in accordance with the invention is described below with reference to the accompanying drawings, in which:

FIGURE 1 is a part sectional side elevation of the shaver with part of the casing removed for clarity;

FIGURE 2 shows, on a larger scale, a longitudinal vertical cross-section through the head frame of the shaver; and

FIGURE 3 is a section on the line III—III of FIGURE 2.

Referring to the drawings, the dry shaver is seen to comprise an elongated inner cutter **11**, slidably mounted on one end of a casing **12** which houses an electric motor **13** for driving the cutter. The motor comprises a coil **14**, stator **15** and a rocking armature **16**, the oscillating motion of the armature being transmitted to the inner cutter by way of an actuator member **17** secured to the armature and a resilient link **18**. The means for driving the cutter are more fully described in our British patent specification No. 788,304.

The inner cuter **11** comprises a plurality of parallel, preferably corrugated, blades spaced along the length thereof, and is enclosed by a head frame **20** detachably secured to the casing **12**. The head frame **20** comprises an open elongated rectangular frame, formed by side members **22** and end members **29**, and a flexible perforated outer shear plate **24** arched about an axis extending longitudinally of the frame, the inner concave surface of the shear plate being maintained in sliding contact with the cutting edges of the cutter teeth **19**, while the curved ends of the shear plate are spaced beyond the ends of the inner cutter. The shear plate is attached along its rectilinear marginal portions to the side members **22**, **22** of the frame by a pair of spring clips **23**, **23**, and is supported at its curved end edges by a pair of resiliently flexible support members **25**, **25** mounted one on each end member **29** of the frame. Each member **25** comprises two semi-annular portions **26** and **27** joined by a radial flange **28**, which is clamped between a transverse end face **30** of end member **29**, and a semi-circular retaining plate **31** having an integral stud **32** secured in a socket **33**. The inner concave face of portion **26** of member **25** is supported by the convex edge of plate **31**, while its outer convex face supports the shear plate by engagement with the inner concave face thereof.

A pair of projections **34**, integral with the end members **29**, are received by complementarily shaped portions of the casing **12** to retain the head frame in position on the casing, one of said portions comprising a resilient member **35** which can be depressed by means of a push-button **36** to release the head frame for removal from the casing.

The resilient support members **25**, while allowing some deformation of the shear plate **24** during a shaving operation, serve to resist excessive deformation of the the shear plate, both when the head frame is attached to the casing and when it is removed for cleaning. The resilient member also bridges the gap between the curved edge of shear plate **24** and the face **30**, thus preventing hairs from being trapped in the gap when the shaver is in use. It is to be understood that the present invention can be incorporated in any shaver embodying an arched flexible shear plate, and that the dry shaver herein described is only one form of shaver in which the invention can be advantageously incorporated.

I claim:

1. In a dry shaver comprising a casing, in combination; a flexible shear plate attached to said casing and held in arched condition thereon to have a concave inner surface and curved end edges; two spaced end members on said casing each positioned adjacent one of said curved end edges but spaced therefrom so that a gap is left between the shear plate and the said end member; two support members of resiliently flexible material; and means securing said members to said casing with each said member having supporting engagement with the inner concave surface of said shear plate adjacent one curved end edge thereof, and also engaging the end member adjacent said one edge, thereby bridging one of said gaps.

2. In a head frame for a dry shaver, in combination; an open elongated rectangular frame including a pair of spaced parallel side members and a pair of spaced end members joining said side members at opposite ends thereof; a flexible shear plate; releasable means attaching two opposite marginal portions of said shear plate to said side members to hold said shear plate in arched condition on said frame to have two opposite curved end edges and a concave inner surface, each of said end edges being disposed adjacent to but spaced inwardly from one of said end members of said frame so that a gap is left between the edge of shear plate and the said end member;

a pair of support members of resiliently flexible material each having two semi-annular portions joined by a radial flange; a pair of semi-circular retaining plates each having a stud projecting therefrom; stud receiving means on the inner faces of each of said end members of said frame, said stud on each said retaining plate being secured in said stud receiving means on one of said end members, each said plate clamping said radial flange of one of said support members against one of said end members of said frame, with one said semi-annular portion of each said retaining member having supporting engagement with said inner concave surface of said shear plate adjacent one curved end edge thereof and bridging said gap between said end edge and one adjacent end member of said frame.

References Cited in the file of this patent

UNITED STATES PATENTS

2,143,896	Nyhagen	Jan. 17, 1939
2,160,987	Rand et al.	June 6, 1939
2,221,314	Nyhagen	Nov. 12, 1940
2,263,155	Wright	Nov. 18, 1941
2,286,443	Scully	June 16, 1942
2,595,693	Norwood	May 6, 1952
2,890,522	Bulova et al.	June 16, 1959
2,952,908	Starre et al.	Sept. 20, 1960
2,979,819	Kleinman	Apr. 18, 1961

FOREIGN PATENTS

552,007	Belgium	Nov. 14, 1956
1,199,777	France	June 22, 1959