Oct. 12, 1943. R. G. AREY 2,331,646

DRY SHAVER

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Fig. 1.

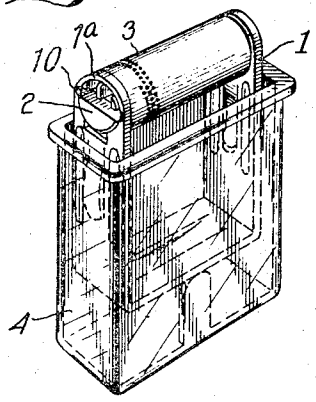


Fig. 2.

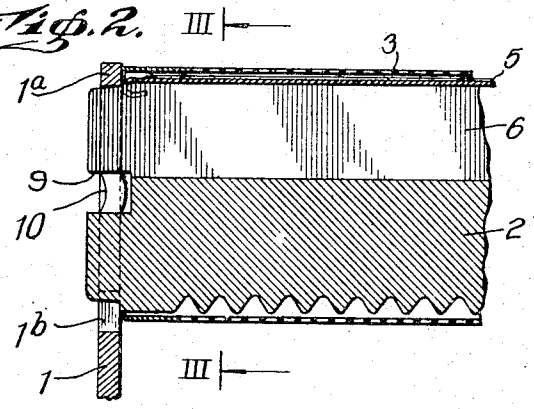


Fig. 6.

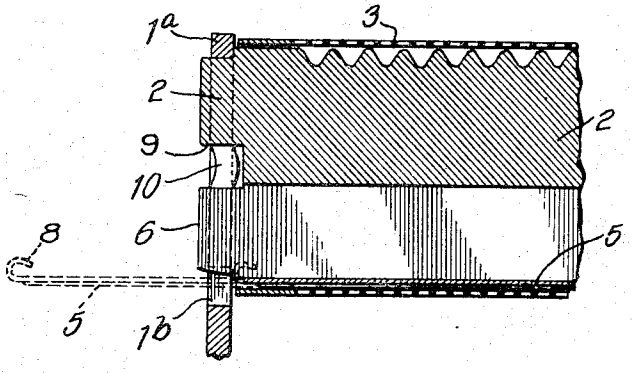


Fig. 4.

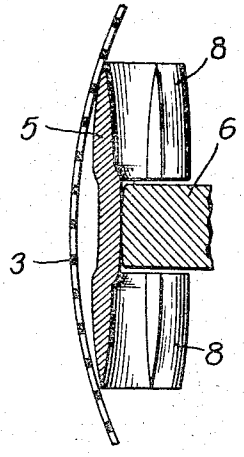
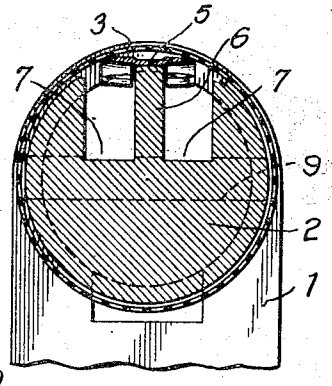


Fig. 3.



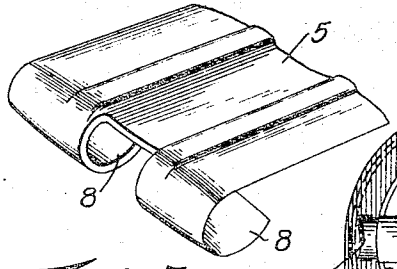
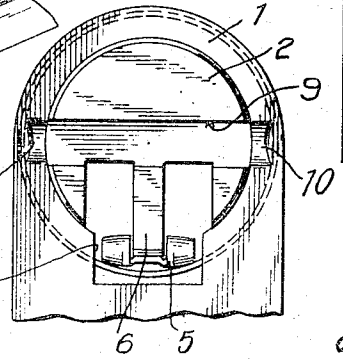


Fig. 5.

Fig. 7.



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Fig. 8.

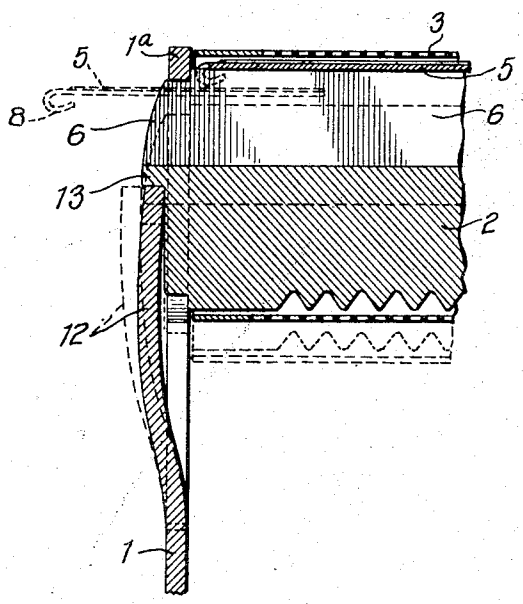


Fig. 9.

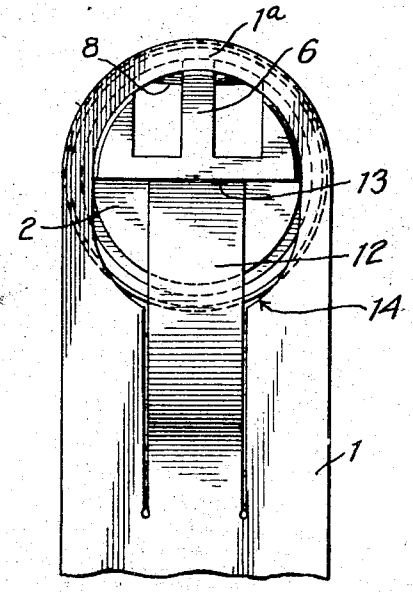


Fig. 10.

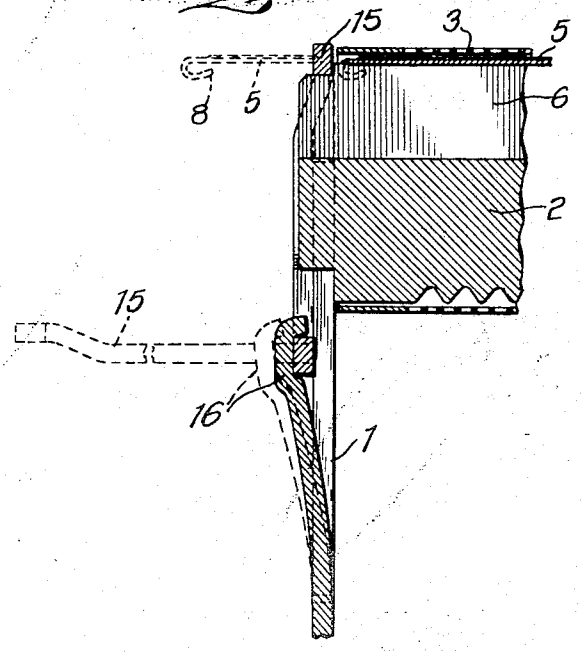
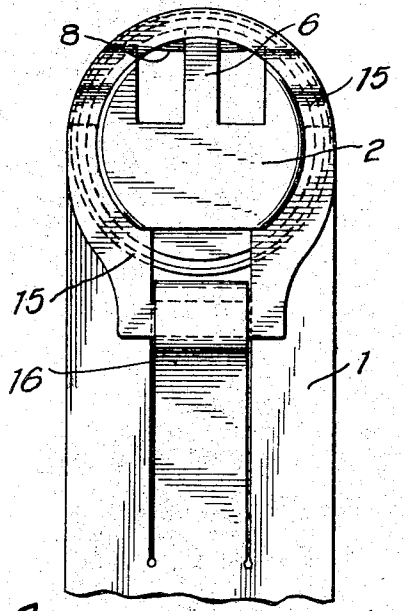


Fig. 11.



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Ralph G. Arey, Swampscott, Mass.

Application July 24, 1941, Serial No. 403,817

17 Claims. (Cl. 30—43)

The invention relates to dry shavers of the type in which a perforated shield is rolled on the skin, and whiskers projecting through the perforations are cut off by a razor blade coacting with the inner face of the shield. The object is to improve the shaving action, and the durability and convenience of use of such devices in the several respects herein set forth. The invention comprehends features of design and organization of the blade itself, and its mounting and provisions for its quick and easy replacement when dull from use, all of such features being capable of application severally or jointly to shavers of this or cognate types.

In the accompanying drawings Fig. 1 is a perspective of the improved shaver in condition for use, Fig. 2 a partial section thereof lengthwise of the blade, Fig. 3 a cross-section of Fig. 2 on line III—III, Fig. 4 an enlarged cross-section of the shield and blade, Fig. 5 a perspective of the blade end, Fig. 6 a partial longitudinal section illustrating removal of the blade, Fig. 7 an end view of Fig. 6, Figs. 8 and 9 represent in partial section and end view respectively a modified form of blade removal, and Figs. 10 and 11 are similar views of another form.

The shaver as shown in Figs. 1 to 7, comprises a bow frame 1 supporting in its arms, in circular apertures therein a cross-structure 2 herein called the core which is appropriately shouldered to fit the apertures and forms the support upon which the shield 3, loosely mounted thereon, rotates as it is rolled on the skin, and upon which the razor blade is carried within the shield. The frame is dimensioned to telescope frictionally into a box-like casing 4, as shown in Fig. 1. The casing serves as a handle for the shaver and also as the housing for the frame and its parts when they are entered therein in the reverse direction, in which condition the base of the frame closes the casing, this general organization being in accordance with my prior application, Ser. No. 354,361, filed August 27, 1940.

The core 2 is generally cylindrical in contour as indicated in Fig. 2 to form a support or backing for the thin and flexible shield 3 and is circumferentially grooved to provide clearance and reduce friction. The blade 5 is carried on the flat top of a rib 6 formed in the core, in this case by milling two channels 7, one on each side, which channels constitute the escape for cut hair, and it is thus held flatwise against the inner face of the shield. In use the shield is pressed against the blade, thereby establishing the appropriate shearing relation, but at other times the blade and shield are more or less separate or free of shearing pressure.

The razor blade is a section of steel strip and can be exactly flat if desired but is preferably longitudinally corrugated or offset along its central axis, as indicated in Fig. 4, which section has special advantage in shavers of this type because of the greater stiffness and the clearance provided by the offset. The blade is double-edged, which is to say, sharpened on both edges, and I have found that sharpening it with a convex edge, instead of the usual concave- or straight-ground edge, gives a noticeably superior shaving effect besides prolonging the life of the edge, and I find further that such convex-sharpened edge can be quite as sharp as the concave edge. These features of a blade design are regarded as independent parts of the present invention.

The blade is removably seated on the rib 6 and held in place by bending the corner portions of the blade itself to form integral lugs thereon. Preferably the end of the blade is first notched and the corners then curled downward as shown at 8 (Fig. 5) but the ends of the blade can be otherwise contoured so as to fit the core support on which it rests. It should in any event have a reasonably snug fit on the top of the rib 6. The blade can be tempered after being shaped as above described, or it can be hardened first and thereafter given the requisite shape, being in either case a one-piece blade removably seated on the rib within the shield.

In the case in hand the blade 5 is held against endwise displacement by the top portions 1*a* of the frame arms 1 which lie against its ends, as shown in Fig. 2. In this form the core 2 is adapted to be rotated in the frame arms so as to remove the blade from juxtaposition to this part of the frame and bring it in line with an ejector notch 1*b* cut in the lower side of the frame aperture, as in Fig. 6, thereby permitting the blade to be moved endwise from the rib through this notch-passage, as indicated in dotted lines. For this purpose one or both ends of the core is formed with a cross-slot 9 to take a coin or the like tool for turning it. The core is held in its normal position by means of one or more detents, such as indicated at 10 struck up in the metal of the frame arms so as to snap into the cross-slot 9 when the core has been rotated to registering position. Thus by merely rotating the core a half-turn in the frame arms the blade can be registered with the ejection slot and removed, and a new one inserted in its place, after which

the rotation of the core to its normal position (Fig. 2) brings the new blade to its working position, in which it is held by the detents.

In the modified form of Figs. 8 and 9 blade removal is accomplished by providing a removable support for one end of the core **2**, indicated as a spring finger **12** engaging a shoulder **13** on the end of the core. By withdrawing this finger the core and shield are allowed to drop, to a limited extent, within its aperture **14** in the frame arm, thereby lowering the rib **6** so that the end of the blade is lowered out of juxtaposition to the top part **1a** of the arm and may thus be endwise removed as indicated by the dotted lines. On introducing a new blade upon the top of the rib and pressing the core upwardly the shoulder **13** snaps over the spring support **12** and the device is again ready for use. Thus instead of rotating the blade to bring it to removal position it is in this case moved vertically downward at one end.

In Figs. 10 and 11 a somewhat similar arrangement is provided, in which the core **2** is immovably fixed in the frame arms and the top part of one of such arms, marked **1a** in the other figures, is cut away, to expose the end of the core at its top side. The blade is normally confined in place by means of a gate **15**, which takes the place of the part **1a** and which is hinged by its lower, square-sectioned limb under a spring finger **16** normally holding it in the position shown in full lines in Fig. 10. By pulling the gate open, dotted lines, the blade **5** is exposed and can be slid off of the rib as indicated in dotted lines. The squared section of the hinge holds the gate resiliently in both its positions.

It is pointed out that in each case one end of the top side of the core structure and shield is exposed by an easy manipulation, quickly performed, and that by virtue of the normal clearance between the shield and blade the latter can be dropped out and a new one substituted without dragging the sharp edges of the latter on the should so as to nick or dull them, also that the convex-ground edges are least likely to be injured by any such contact in any event; and further, that the specific manner of exposing the parts for this purpose is subject to considerable variation of design, as already indicated, the most practical method being to have the blade removable endwise through the same aperture in the frame arm as supports the core, but no limitation is intended in respect to the construction of the latter nor to the method of shield mounting whereby it is made freely rotatable when being rolled on the skin.

I claim:

1. A dry shaver of the type including a rotary reticulate shield and interior normally fixed razor blade, the combination with a blade support about which the shield rotates and a one-piece blade having portions formed integral therewith for removably holding it on said support in flatwise relation to the inner face of said shield and removable therefrom without dismantling the other parts.

2. In a dry shaver of the type specified in the preceding claim the combination with a blade support, of a razor blade thereon formed with bent end portions whereby it fits with and is held upon such support.

3. In a dry shaver of the kind specified in claim 1 the combination of a blade support in the form of a rib, a razor blade having bent corner lugs whereby it embraces such rib, being endwise movable along the same.

4. In a dry shaver of the type specified in claim 1 the combination of a blade support and a razor blade thereon having both edges convex-ground and both offset from the longitudinal central plane of the blade, and both adapted for shearing contact with the rotary shield.

5. In a dry shaver of the kind having a rotary shield and interior normally fixed razor blade, said blade being double-edged and supported flatwise against the inner face of the shield and both of its edges being convex-ground for contact with such face.

6. In a dry shaver of the kind having a rotary shield and interior stationary blade, a blade having two convex-ground cutting edges offset from the longitudinal central plane of the blade and both adapted for contact with the inner face of such shield.

7. In a dry shaver of the type including a rotary shield and an interior normally fixed blade, of means for supporting said blade and on which it is endwise movable and means operable without dismantling the device for exposing the end of said support and blade to facilitate endwise withdrawal of the blade through the end of the shield.

8. In a dry shaver of the kind including a rotary shield and interior normally fixed blade, the combination of means for supporting the shield free from normal shearing pressure on the blade and means for exposing the end of the blade for endwise removal through the end of the shield.

9. In a dry shaver of the kind including a rotary shield and interior fixed blade, the combination of the razor blade, a core structure adapted for supporting it in shearing relation to the shield and a gate normally confining the blade on said structure, adapted to be opened to facilitate endwise removal of the blade through the end of the shield.

10. In a dry shaver of the kind including a rotary shield and a normally fixed blade in shearing relation thereto, the combination of a blade support for holding the blade in such relation, and a frame in which such support is mounted and in which it is movable without dismantling the device for exposing the end of the blade to facilitate endwise removal thereof.

11. In a dry shaver of the kind including a rotary shield and a relatively fixed blade, the combination of a frame and a blade support rotatably mounted therein and provided with means for holding it in and against unintended movement from its shaving position.

12. The combination of claim 11 in which said movement exposes the blade support so that a blade thereon may be removed.

13. The combination of claim 11 in which the blade support is rotatably mounted in apertures of the frame and provided with a tool-receiving slot in the portion journalled in such aperture, for rotating such support to different positions, one of which positions exposes the end of the blade support for removal of a blade thereon.

14. The combination of claim 11 in which the blade support includes a rib and the blade is shaped to fit and slide endwise on said rib and in which the end of said rib, and of a blade thereon, is exposed in one of said rotary positions to permit removal of the blade by sliding it off of the rib.

15. A dry shaver including a rotary reticulate shield adapted to be rolled on the skin, an interior normally fixed razor blade having a convex-ground edge, and supporting means for said

shield and blade holding the latter free of any substantial pressure against the former when not in use, said shield having a bearing against said convex edge when used for shaving.

16. A dry shaver including a rotary reticulate shield adapted to be rolled over the skin, an interior normally fixed razor blade normally free of shearing pressure against such shield but adapted to have pressure contact therewith during shaving, a support for said blade on which it is endwise movable, a frame in which said support is rotatably mounted with one end of said support exposed through the end of said frame, said support being channeled to provide a hair escape through the frame and provided with means whereby it may be rotated from shaving position in said frame for the removal of the blade.

17. A dry shaver including a rotary reticulate shield adapted to be rolled on the skin, an interior normally fixed strip-form razor-blade having a convex-ground edge and supporting means for said shield and razor-blade holding the latter with the convex side of its edge in shearing contact with the inner surface of said rotary shield.

RALPH G. AREY.