Dec. 9, 1941. B. R. NYHAGEN 2,265,305

DRY SHAVER

Original Filed June 23, 1938

Fig. 1.

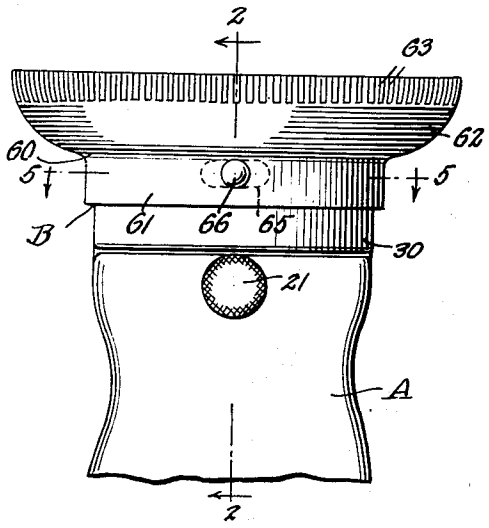


Fig. 3.

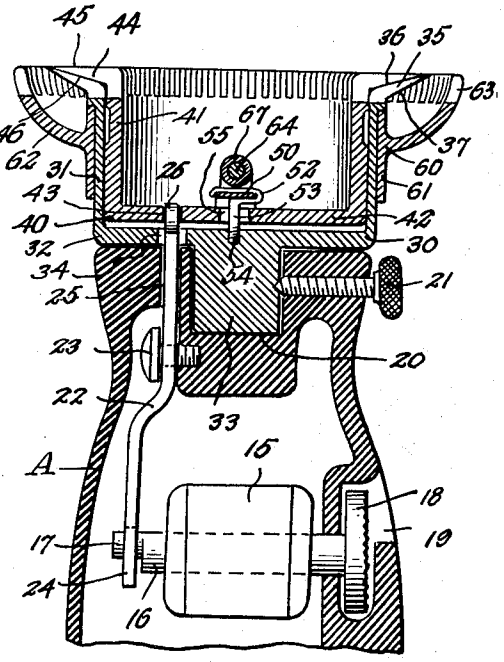


Fig. 2.

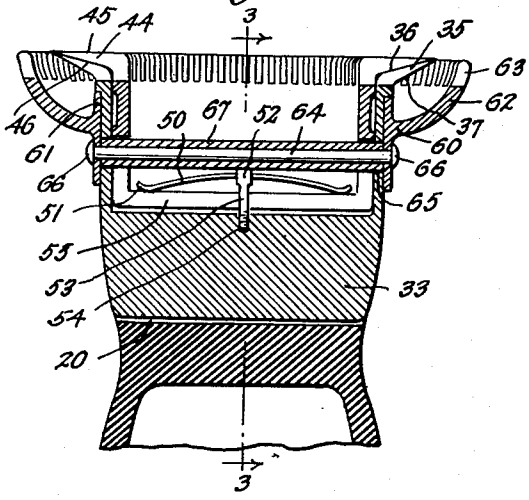


Fig. 5.

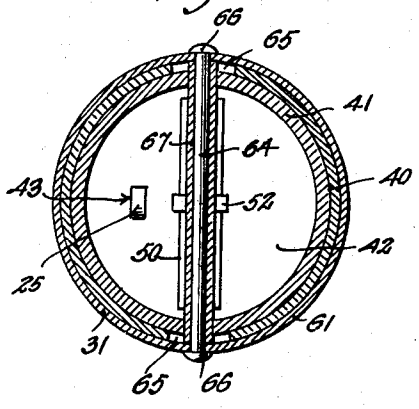
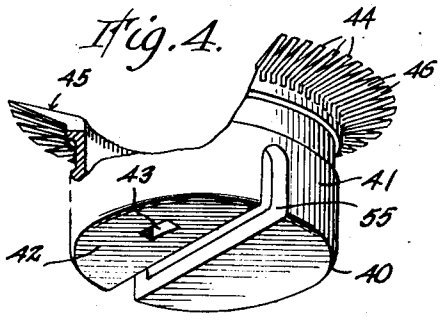


Fig. 4.



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2,265,305

DRY SHAVER

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Original application June 23, 1938, Serial No. 215,364. Divided and this application January 23, 1939, Serial No. 252,348

6 Claims. (Cl. 30—43)

This invention relates to electric razors or dry shavers and is directed to an improved cutter head of the type which includes fixed and movable cutter elements respectively provided with complementary cutting teeth in which the teeth of the movable cutter element are adapted to engage the skin during the shaving operation, the same being a division of my co-pending application, Serial No. 215,364, filed June 23, 1938.

The invention broadly comprehends in combination with a dry shaver of the indicated character, a guard element adapted to engage the skin which is connected to and movable with the movable cutter element and which is spaced from the cutting teeth thereof.

The invention further embodies in a dry shaver of this type a connection between the guard member and the movable cutter element which extends through a slotted portion of the fixed cutter element so as to guide the movable cutter and guard elements in their movement with reference to the fixed cutter element.

As a further feature the invention resides in the novel construction and assembly of the cutter elements so as to permit of ready disassembly of the movable cutter element from the fixed cutter element for the purpose of cleansing and regrinding the teeth thereof.

More particularly the invention resides in an improved cutter head for dry shavers which embodies a pair of nested hollow cylindrical cutter elements, each of which is provided at adjacent ends with lateral outwardly directed complementary circumferentially spaced cutting teeth together with spring means for impinging against each other the confronting faces of the teeth of said cutter elements and means for imparting rotatory motion to one of the cutter elements.

The invention is further directed to a cutter head of this character in which a guard element is provided which is connected and movable with the movable cutter element and which is provided with an edge spaced from the teeth to stretch the skin and present the hair to the teeth in an erect position for severance thereby.

With the foregoing and other objects in view, the invention is set forth in greater detail in the following specification, illustrated in the accompanying drawing, and pointed out in the appended claims.

In the drawing:

Fig. 1 is a side view of a dry shaver constructed in accordance with the invention.

Fig. 2 is a sectional view therethrough taken approximately on the line 2—2 of Fig. 1.

Fig. 3 is a sectional view taken approximately on the line 3—3 of Fig. 2.

Fig. 4 is a perspective view of the movable cutter element.

Fig. 5 is a horizontal sectional view taken approximately on the line 5—5 of Fig. 1.

Referring to the drawing by characters of reference, A designates generally a handle of a dry shaver which houses a motor 15, the motor shaft 16 of which is formed at one end with an eccentric pin 17 and is provided at its opposite end with an actuating wheel 18 exposed through an opening 19 formed in the handle for the purpose of insuring the starting of the motor.

The upper end of the handle A is provided with a transverse groove 20 into which extends a set screw 21. A rock lever 22 is fulcrumed as at 23 and is provided with a forked lower terminal 24 engaging over the eccentric pin 17. The upper end portion of the rock lever 22 extends through a slot 25 in the handle and is provided with an upwardly projecting actuating terminal 26 which is oscillated by the rocking of the lever effected through the eccentric pin 17.

The cutter head, designated generally by the reference character B, includes a fixed cutter element 30 which is of generally cup-shaped formation and comprises a hollow cylindrical wall 31 and a bottom wall 32. The bottom wall is provided with a diametrically disposed depending rib 33 which is adapted to fit within the groove 20 and which is secured in place by means of the set screw 21. The bottom wall is also formed with a slot 34 through which the upper end portion of the rock lever 22 extends and from which the terminal 26 thereof protrudes. The upper edge portion of the hollow cylindrical wall 31 of the fixed cutter element 30 is provided with radially protruding circumferentially spaced cutting teeth 35 which are formed with upper and lower converging faces 36 and 37.

A movable cutter element 40 of generally cup-shaped formation and of a size to nest within the fixed cutter element 30 is provided and includes a hollow cylindrical wall 41 and a bottom wall 42, the latter being provided with an opening 43 with which the terminal 26 of the rock lever 22 engages to impart to said movable cutter element 40 rotatory or oscillatory motion. The upper end edge portion of the wall 41 is formed with radially disposed circumferentially spaced cutting teeth 44 having upper and lower faces 45 and 46 which faces converge outwardly and the lower

face 46 of which teeth 44 confront the upper faces 36 of the teeth 35.

In order to releasably retain the movable cutter element 40 in nested relation within the fixed cutter element 30 and to resiliently impinge the faces 36 and 46 against each other, suitable means is provided which, as herein illustrated, consists of an upwardly bowed resilient spring 50 which extends diametrically across the lower wall 42 of the movable cutter element, the opposite terminals 51 thereof engaging the upper surface of said wall and with the intermediate portion engaged under the hooked upper end 52 of a pin 53, the lower end 54 of which is threadedly anchored in the lower wall 32 of the fixed cutter element 30. The movable cutter element 40 is provided with a slot 55 extending diametrically across the lower portion thereof through the bottom wall and through diametrically opposite portions of the cylindrical wall 41, the hooked pin 53 extending through the central portion of said slot 55.

A guard member designated generally by the reference character 60 includes a hollow cylindrical base 61 which is of a size to snugly surround the outer periphery of the hollow cylindrical wall 31 of the fixed cutter element, while permitting of rotatory movement with reference thereto. The guard member further includes an annular cross sectionally arcuate flange 62 which is curved upwardly and the upper edge of which is spaced from and parallel to the free edges of the cutting teeth 35 and 44. Preferably, the free edge portion of the flange 62 of the guard element is provided with circumferentially spaced teeth 63 which correspond approximately in width to the width of the cutting teeth 35 and 44.

In order to effect movement of the guard element 60 by and with the movable cutter element 40 and to assemble and guide the same in its movement, a rod 64 extends diametrically through the base 61 thereof and through diametrically disposed slots 65 formed in the hollow cylindrical wall 31 of the fixed section, the rod engaging in the portions of the slot 55 of the movable cutter element 40. The opposite ends of the rod 64 are preferably riveted as at 66 and a hardened tubular sleeve 67 surrounds the portion of the rod located between diametrically opposite points of the inner periphery of the base 61 of the guard element.

From this construction and arrangement it will thus be apparent that the guard element is permanently attached to the fixed cutter element 30 but is capable of rotatory or oscillatory motion with reference thereto, while the slotted portion 55 of the movable cutter element 40 permits said movable cutter element to be disassembled from the fixed cutter element and guard element after the bowed spring 50 is disengaged from the hooked terminal 52 of the pin 53.

In use and operation when the motor shaft 16 is rotated, the rock lever 62 is oscillated so that its terminal 26 effects an oscillating rotatory movement of the movable cutter element 40 and the guard element 60 with reference to the fixed cutter element 30. This causes the teeth 44 of the movable cutter element to oscillate with reference to the teeth 35 of the fixed cutter element whereby when the upper surfaces 45 of the teeth 44 are brought into flat contact with the skin, the hair which protrudes between the teeth will be severed. Due to the fact that the teeth 44 of the movable cutter element and the teeth 63 of the guard element are disposed in flat contact with the skin to stretch the same and to agitate the skin in the region of the cooperating cutting teeth 44 and 35, it will be apparent that the hair will be effectively caused to protrude between the teeth for shearing thereof.

What is claimed is:

1. A cutter head for dry shavers including a pair of nested hollow cylindrical cutter elements each having at adjacent ends lateral outwardly directed complementary circumferentially spaced radially disposed cutting teeth, spring means for impinging against each other the confronting faces of the teeth of said elements, and means for imparting rotatary movement to one of the elements.

2. A cutter head for dry shavers including a pair of nested hollow cylindrical cutter elements each having at adjacent ends laterally outwardly directed complementary circumferentially spaced cutting teeth, spring means for impinging against each other the confronting faces of the teeth of said elements, means for imparting rotatory movement to one of the elements, and a guard element connected to and movable with the cutter element.

3. A cutter head for dry shavers including a pair of nested hollow cylindrical cutter elements having at adjacent ends outwardly directed complementary circumferentially spaced cutting teeth, spring means for impinging against each other the confronting faces of the teeth of said elements, means for imparting rotatory movement to one of the elements, and a guard element connected to and movable with the cutter element having a free outer edge spaced from and parallel to the free edges of the cutting teeth.

4. A cutter head for dry shavers including a pair of nested hollow cylindrical cutter elements having at adjacent ends outwardly directed complementary circumferentially spaced cutting teeth, spring means for impinging against each other the confronting faces of the teeth of said elements, means for imparting rotatory movement to one of the elements, and a guard element connected to and movable with the movable cutter element and having a toothed free edge spaced from and parallel to the free edges of the cutting teeth.

5. A cutter head for dry shavers including a pair of nested hollow cylindrical inner and outer cutter elements each having at adjacent ends lateral outwardly directed complementary circumferentially spaced cutting teeth and at the remaining adjacent ends inner end walls, means for impinging against each other the confronting faces of the teeth of said elements, comprising a spring bearing against the inner end wall of the outer member, and means carried by the inner end wall of the inner member with which said spring engages, and means for imparting rotatory movement to one of the cutter elements.

6. A cutter head for dry shavers including a pair of nested hollow cylindrical cutter elements each having at adjacent ends thereof complementary circumferentially spaced radially disposed cutting teeth arranged at an angle to the axes of said cutter elements, means for impinging against each other the confronting faces of the teeth of said elements, and means for imparting rotatory movement to one of said elements.

BARNEY R. NYHAGEN.