May 2, 1944. L. H. AMDUR 2,347,870

ELECTRIC DRY SHAVER

Filed May 14, 1941

Fig. 1.

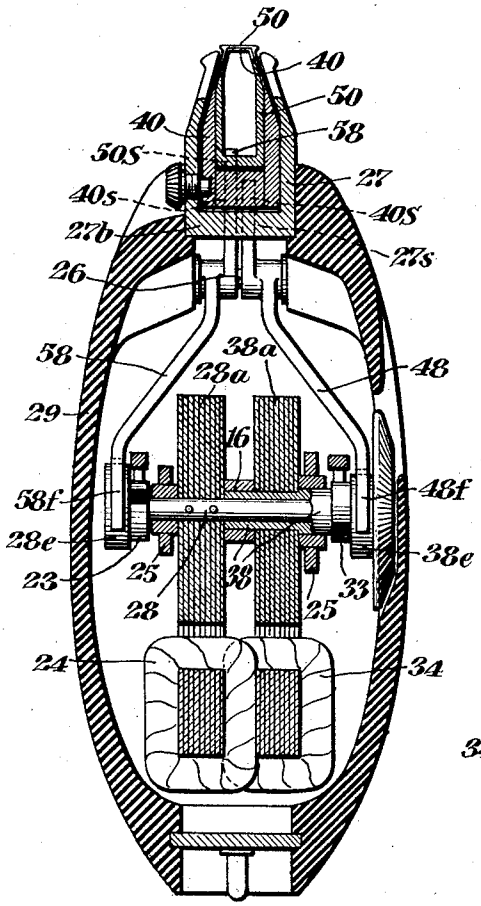
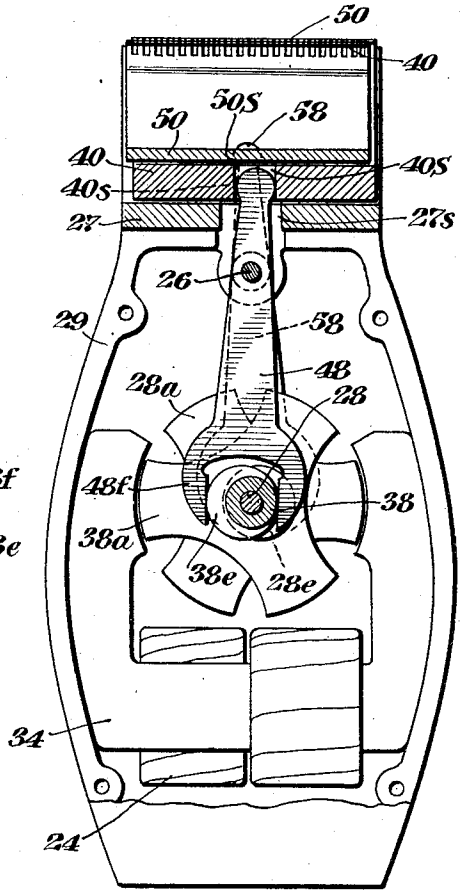


Fig. 2.



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Patented May 2, 1944 2,347,870

UNITED STATES PATENT OFFICE

2,347,870

ELECTRIC DRY SHAVER

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Application May 14, 1941, Serial No. 393,334

13 Claims. (Cl. 30—43)

This invention relates to dry shavers of the type shown in my earlier application Serial Number 352,038, filed August 9, 1940, wherein both the face contacting member and the inner or "sheathed" cutting member are reciprocated, the latter preferably moving at a higher rate of speed. In the said application the faster moving sheathed member is driven directly from the armature shaft while the slower moving face contacting member is driven through reducing gears from the armature shaft.

The object of this invention is to dispense with the need of reducing gears and the like. At the very high rate of speed of dry shavers, mechanical difficulties might result from the use of gearing, which, due to the compactness and use of dry shavers, must be small and light. The object of this invention is to provide means for driving the face contacting member and the sheathed member at different speeds, which will operate in a quiet and improved manner, and which will be of inexpensive construction. A further object is to provide a driving means as described which will allow the members to be operated at higher (although different) speeds than would be possible where gearing or similar reduction means are used.

Where gear and equivalent reduction means are employed for driving the slower moving face contacting member, the ratio of reduction in speed between the two members is circumscribed for mechanical and constructional reasons. A further object of this invention is to provide means which, while permitting the sheathed cutting member to reciprocate at any desirably high speed, will also permit the face contacting member to be moved at any desirably low speed; i. e., means for driving both members with any desirably great speed differential between them. A further object is to provide means for readily and facilely adjusting the differential of speed between the two members.

For the attainment of these and such other objects as may hereinafter appear or be pointed out, I have shown one embodiment of my invention in the accompanying drawing, wherein Fig. 1 is a sectional side elevation and Fig. 2 is a sectional front view, of a dry shaver embodying my invention.

In the aforementioned application, the principle of moving both the face contacting and the sheathed cutting members, is illustrated in connection with both the type of dry shavers having blade elements (i. e., presenting spaced cutting edges extending across the top of the shaver) and the type having teeth elements (which present a cutting line along one side or both sides of the shaver). The improved driving means of this application is illustrated in connection with the first mentioned type, although it is of course applicable to both types.

Shaft 28 is journalled in suitable bearings in frame members 25 which are themselves firmly secured to the frame or split casing 29 which forms the handle of the device. The device is provided with two armatures, one of which 28*a* is secured to the shaft 28. Encircling shaft 28 and extending rightward from armature 28*a* is a sleeve 38 which is journalled in the right frame member 25. The second of the two armatures 38*a* is secured to the said sleeve 38. A collar 16 may be placed on the sleeve between the two armatures for spacing purposes. The two armatures 28*a* and 38*a* may have individual fields, respectively, 24 and 34.

The inner shaft 28 is provided at its left end with an eccentric cam 28*e* with which coacts the forked end 50*f* of a lever 50 pivoted at 26. The upper end of lever 50 clears through a passage 27*s* in the base or web 27*b* of the shearing head casing 27, and through a passage 40*s* in the base of the sheathed cutting member 40. The upper end of lever 50 is received in a socket 50*s* in the sheathed member 50.

The outer sleeve 38 is provided at its right end with an eccentric cam 38*e* with which coacts the forked end 60*f* of a lever 60 also pivoted at 26. The upper end of lever 60 also clears through the passage 27*s* of casing 27 and its end is received in a socket 60*s* in the sheathed member 50.

The inner shaft 28 is provided at its left end with a current interrupter 23 associated with the circuit of the field 24, while the outer sleeve 38 is provided at its right end with a current interrupter 33 associated with the circuit of the field 34.

The field 34 and/or its interrupter 33 are such that armature 38*a* rotates at a lower speed than does armature 28*a* (associated with field 24 and interrupter 23), so that the face contacting member 40 is reciprocated at a slower speed than is the sheathed member 50. The machine may be set, by design of the fields, armatures, interrupter mechanism, etc., so that the two members reciprocated at pre-determined speeds. The speeds may be further regulated at the factory. In addition, further adjustments may be made by individual users to regulate the speed, especially of the face contacting member, by adjusting the tension of the spring (not shown) associated with

the interrupter mechanism. It is desirable for different reasons to regulate the speed of the face contacting member; one reason is to adjust this member to different face conditions.

Although the invention has been described only in connection with a shaver having hair receiving openings in the form of slots extending across a flat surface, it is clear that the invention applies equally well to shavers having hair receiving openings in the form of circular and non-circular holes in a flat, rounded or other surface, and to shavers having a rotary or oscillatory sheathed cutting member.

Having described my invention, what I claim and desire to secure by Letters Patent is:

1. In a dry shaver of the type which has a movable face contacting member and a movable sheathed member, the combination of a shaft, a sleeve encircling a portion of the said shaft, an armature and an eccentric cam mounted on the said inner shaft at one side of the shaver, a lever actuated by the said eccentric cam for moving the said sheathed cutting member, an armature and an eccentric cam mounted on the said sleeve at the other side of the shaver, and a lever actuated by the last named cam for moying the said face contacting member.

2. In a dry shaver of the type which has a movable face contacting member and a movable sheathed member, the combination of a shaft, a sleeve encircling a portion of the said shaft, a pair of armatures, a pair of eccentric cams, a pair of current interrupters, the shaft and sleeve being each provided with an armature, an eccentric cam and a current interrupter, and means operatively connecting the said eccentric cams with respective ones of the said cutting members.

3. In a dry shaver of the type which has a movable face contacting member and a movable sheathed member, the combination of a shaft, a sleeve encircling a portion of the said shaft, armatures on the said shaft and said sleeve, eccentric cams on the said shaft and said sleeve, and levers operatively connecting the said eccentric cams with respective ones of the said cutting members.

4. In a dry shaver of the type which has a movable face contacting member and a movable sheathed member, the combination of a shaft, a sleeve encircling a portion of the said shaft, an armature secured to the said inner shaft, an armature secured to the said sleeve, and means for operatively connecting the said armatures with respective ones of the said cutting members.

5. In a dry shaver of the type which has a movable face contacting member and a movable sheathed member, the combination of an electrical field and an associated armature, a second field and its associated armature adapted to rotate at a speed lower than the first mentioned armature, and means operatively connecting the faster armature with the sheathed member and connecting the slower armature with the face contacting member.

6. In a dry shaver of the type which has a movable face contacting member and a movable sheathed member, the combination of a pair of armatures and means operatively connecting the said armatures with respective ones of the said cutting members.

7. In a dry shaver of the type which has a movable face contacting member and a movable sheathed member, the combination of a pair of electrical fields, a pair of armatures associated therewith and means operatively connecting the said armatures with respective ones of the said cutting members.

8. In a dry shaver of the type which has a movable face contacting member and a movable sheathed member, the combination of an armature, a second armature adapted to rotate at a speed lower than the first mentioned one, and means operatively connecting the faster armature with the sheathed member and connecting the slower armature with the face contacting member.

9. In a dry shaver, the combination of a movable face contacting member, a movable sheathed member, means for driving the two cutting members, and means for adjusting the relative speed of the two members.

10. In a dry shaver, the combination of a movable face contacting member, a movable sheathed member, and independent means for driving the said sheathed member at one speed and for driving the said face contacting member at a slower speed.

11. In a dry shaver, the combination of a movable face contacting member, a movable sheathed member and independent means for driving the two said movable cutting members.

12. In a dry shaver, the combination of a movable face contacting member, a movable sheathed member, and driving means therefor including means for regulating the differential in speed between the two members.

13. In a dry shaver, the combination of a movable face contacting member, a movable sheathed member, and independent driving means for the two said members, each of the two said driving means having means for adjusting the speed of its driven member.

LEON H. AMDUR.