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G. DALKOWITZ

2,229,959

SHAVING DEVICE

Filed June 26, 1937

Fig. 1.

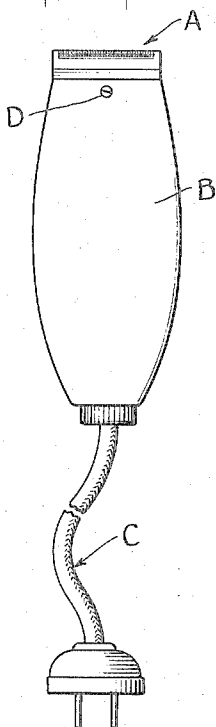


Fig. 2.

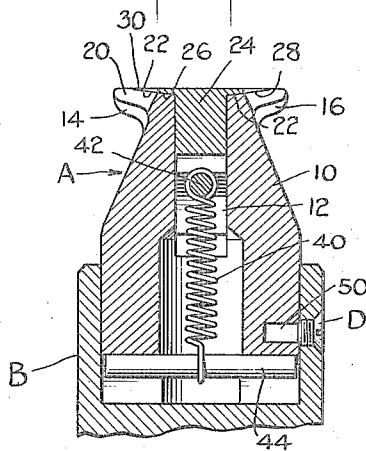


Fig. 3.

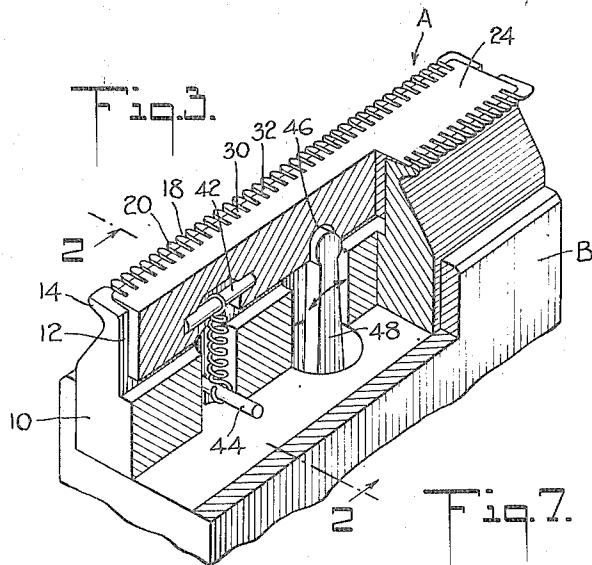


Fig. 4.

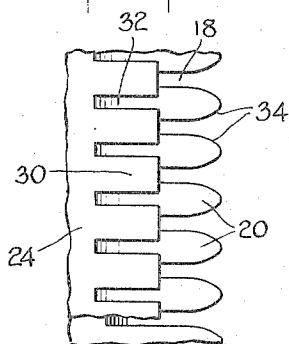


Fig. 5.



Fig. 6.

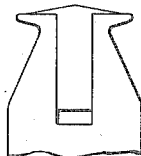


Fig. 7.



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SHAVING DEVICE

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5 Claims. (Cl. 30—43)

This invention relates to the art of dry shaving in which the shaving or hair cutting operation is effected without the use of preliminary treatment as by detergents, and in particular, it relates to dry shaving mechanism of the type in which the cutting of the hair is effected by a shearing or clipping action, that is by the interaction of relatively movable cutting edges.

One of the objects of my invention is the provision of an arrangement whereby the discharge of cut hairs from the apparatus is facilitated and clogging of the shaver avoided and more particularly the provision of such an arrangement in a dry shaver in which the movable cutter is arranged to engage the face.

A further object of my invention is the provision in a dry shaver comprising a stationary cutter and a movable cutter arranged above the stationary cutter and provided with a central section to engage the face and toothed sections laterally thereof.

For the attainment of these objects and such other objects as will hereinafter appear or be pointed out I have shown by way of example, several illustrative embodiments of my invention in the drawing, wherein:

Figure 1 is a view showing a complete assembly including a shaving head according to my invention mounted in a handle;

Figure 2 is a sectional view through a shaving head embodying my invention and taken substantially on the line 2—2 of Figure 3 looking in the direction of the arrows;

Figure 3 is a view of my shaving head in perspective portions being broken away to expose the interior mechanism;

Figure 4 is a plan view on an enlarged scale of portions of the cutting teeth of the shear plate and the cutter member; and

Figures 5, 6 and 7 are end views respectively of modified forms of my invention.

Before going into a detailed description of the various elements of the mechanism disclosed herein I will premise that my invention is concerned with a shaving head, that is, that portion of a shaving device that performs the shaving or clipping function and that is customarily mounted on a handle, which may contain an electric motor to actuate the moving parts of the shaving head. In general my shaving head comprises a pair of relatively movable members one of which may be termed the shear plate and the other the cutter and these members are each provided with cutting edges that move across each other to effect a shearing or clipping action.

Both the cutting member and the shear plate are shown as having face engaging portions and the cutter is shown as superposed over the shear plate. In order to secure the necessary contact between the teeth of the cutter and the shear plate, means are provided for the purpose of drawing them together.

In order to provide for the disposal of waste and to prevent its entrance into the inner parts of the razor, which might clog it, I have shown the cutting areas disposed on the outside of solid portions which are unbroken so that the waste can find no entrance therein while on the other hand, the cutting portions are provided with cutting teeth spaced from each other by slots of such configuration and so disposed that the waste will pass easily therethrough, and the teeth are so disposed that they overhang the body of the shaving head, so that the waste passing from the cutting area through the slots will issue therefrom at points outside the body of the razor.

I have further found that to secure efficient action, it is desirable to have the cutting edges formed on teeth that are separated by relatively narrow slots. But since such narrow slots are adapted to receive a limited number of hairs I have shown the slots as provided with widened entrance portions, as a result of which construction the number of hairs entering the wide entrance portions and thereafter guided into the narrow portions will be greatly increased.

Referring now to Figure 1 it will be observed that I there show my shaving head, indicated in general by A, as mounted in a handle B, which, if desired, may contain a source of motive power of any suitable or preferred type, and where an electrical motor is used, electrical connections for connecting the same to a suitable source of power may be provided. Such connections are indicated at C.

Suitable means may be provided for locking the shaving head A in the handle B and for this purpose a set screw D is shown. This construction provides for ready removal of the shaving head for cleaning or replacement purposes.

On referring to Figures 2 and 3 it will be observed that my shaving head comprises a base block 10 which seats directly in the handle B and may therefore be termed a fixed member.

The base block 10 is shown as formed with a longitudinal slot or channel 12 and as having its upper portion widening laterally outward as indicated at 14 and 16. The laterally extending portions 14 and 16 constitute what may be termed

a shear plate and they are each broken up into a row of teeth 20 separated by slots 18 whereby a comb like construction results.

The slots 18 are shown as terminating short of the channel 12, so that shaving waste passing through said slots cannot enter the channel and the inner end walls of said slots are shown inclined in the general direction of the outer walls of the base block 10.

10 The upper surfaces of the portions 14 and 16 have their end portions lying in the same plane but their inner portions slope downwardly as indicated at 22 so as to result in a concave conformation, and in this concavity seats the upper portion of a cutter 24 which is generally T-shaped in cross section, and the stem of the T is slidably mounted within the channel 12 of the base block while its cross bar comprises the laterally extending portions 26 and 28 which seat 15 on the concave portion of the shear plate. The upper surface of the cutter 24 is shown as flat and as lying in the same plane as the aforementioned upper surfaces of the end portions 14 and 16.

25 The portions 26 and 28 of the cutter are shown as broken up into teeth 30 by inwardly extending slots 32, and it will be observed that the spacing of the teeth 30 is the same as that of the teeth 20 of the shear plate, and that the inner ends of the slots 32 are spaced a substantial distance 30 from the stem of the T, whereby, entrance of shaving waste into the channel of the base block 10 is prevented.

Cutting edges are formed at the juncture of 35 the side walls and the upper surfaces of the teeth 20 and the side walls and lower surfaces of teeth 30 so that as the teeth 30 move relatively to the teeth 20 these cutting edges cooperate in a shearing action on hairs positioned in the slots 40 between said teeth. The shaving waste resulting at these cutting zones will pass through slots 32 or 18; in either case, it will be conducted to points exterior to the shaving head.

It will be observed that the teeth 20 extend 45 beyond the teeth 30, so that in the process of shaving during which the razor is moved over the surface to be shaved substantially in the direction of the slots, hairs will first enter the slots 18 of the shear plate, and as the motion of 50 the razor over the surface to be shaved continues, they will enter the slots 32 of the cutter, and will then be subjected to the shearing action.

In order to increase the efficiency of the shaver, I have shown the slots 18 as provided with 55 outwardly flaring entrance portions 34, so that as the razor is moved in the direction of the slots over the face or other surface to be shaved, a great proportion of the hairs on said surface will enter said widened entrance portions of the slots 60 18 and will be guided by the walls 34 into the narrow portions of the slots 18 and subsequently into the slots 32. This construction is clearly shown in Figure 4, and it will be observed that before shearing takes place, it is necessary for 65 the hairs to enter the slots 32 between the teeth 30 of the cutter, and that before they reach the cutting zone after entering the widened portions 34 of the slots 18 they must pass through an intermediate portion of slots 18 which is of restricted width and has parallel side walls which 70 serve effectively to keep the hair from being pushed out of the slot by the action of the cutter.

I have found in practice that a slot width for the slots 18 of .005" to .018" and a slot width 75 for the slots 32 of .006" to .010" gives highly

satisfactory results, and these dimensions may be associated with a tooth pitch of 40 to the inch.

In order to keep the cutting edges of the cutter and the shear plate in contact which is obviously necessary for their proper functioning, 5 I may provide any suitable or preferred means for this purpose, such for example, as the resilient means shown in the drawings, in which a tension spring 40 is shown as anchored at one of its ends to a pin 42 suitably supported within 10 the body portion of the cutter 24, as by being positioned within a recess in said body portion, while its lower end is anchored to a pin 44 suitably supported in base block 10, as by being po- 15 sitioned in recesses in said base block. It will be observed that the springs 40 will follow the movable cutter in its motion, since their ends are free to move laterally; this construction results in reduced friction over one in which a stationary pressure member is made slidable in re- 20 lation to the movable cutter.

In order to provide for relative motion of the cutter and the shear plate, whereby the shearing is effected, I provide means for reciprocating 25 the cutter, and this means may be of any suitable or preferred type. By way of example, I have shown the cutter as provided with a recess 46 in its lower surface and into this recess is shown projecting the upper end of a lever 48, 30 which may be caused to reciprocate or oscillate by suitable motive power contained in the handle B. This construction, it will be observed, permits ready disconnection of the shaving head A from the handle B since it is only necessary 35 to loosen the set screw D. In positioning the head in the handle it is only necessary to effect registration of the recess 46 with the end of the lever 48 while placing the head A in the recess provided for its reception in the handle B and thereafter the set screw may be used to lock the 40 head in place. At 50 a recess is shown in the head A into which the end of the set screw may project and thereby effectively lock the head to the handle.

Figures 5, 6 and 7 represent end views of vari- 45 ous modifications in which the shear plate and the cutter have various contours that I have found satisfactory in use.

In Figure 5, the shearplate is shown with a concave upper surface while the cutter has a 50 convex upper surface, this convexity resulting from a bevelling off of the toothed side portions.

In Figure 6 the shear plate has a flat upper surface and the cutter has a convex upper surface in the form of an obtuse wedge. 55

In Figure 7 the shear plate has a flat upper surface and the cutter also has a flat upper surface. Instead of wedge shaped cutter teeth as shown in the other forms of my invention the teeth of the cutter are shown as having their end 60 portions blunted and rising abruptly from the shear plate.

While I have herein illustrated and described several embodiments of my invention it will be understood that these are illustrative merely, 65 and that my invention may be embodied in many other forms without departing from the spirit thereof, as will be obvious to those skilled in the art, and that the disclosure hereof is to be interpreted as illustrated merely and not in a limiting 70 sense, and that I do not limit myself other than as called for by the prior art.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent, is:

1. In a shaving device, a toothed shear plate, a toothed cutter mounted for movement in slidable adjacency to said shear plate, and said teeth on the cutter being adapted to cooperate with said teeth on the shear plate to effect a cutting action, and tension means for holding the teeth of said shear plate and said cutter in contact said tension means being in the form of a coil spring secured at one end to the cutter and at its other end to the shear plate, and said end secured to the cutter being movable in two directions relatively thereto.

2. A shaving device comprising a toothed shear plate, a toothed cutter mounted for movement in slidable adjacency to said shear plate, and said teeth on the cutter being adapted to cooperate with said teeth on the shear plate to effect a cutting action, and resilient tension means for holding the teeth of said shear plate and said cutter in contact said resilient tension means being in the form of a coil spring secured at one end to the cutter and at its other end to the shear plate in such a manner as to permit relative adjusting movements between said ends and said cutter and shear plate respectively.

3. A shaving device having a shear plate provided with teeth disposed in spaced rows on opposite sides thereof, a cutter mounted for movement in slidable adjacency to said shear plate, said cutter having parallel teeth disposed in two parallel rows on opposite sides of a solid face engaging portion, and said teeth on the cutter being adapted to cooperate with said teeth on the shear plate to effect a cutting action, and means acting only between said shear plate and said

cutter to hold the teeth thereof in contact, said means being in the form of a coil spring having one end anchored to the cutter so as to be adapted for slight movement relatively thereto, and having its other end anchored to the shear plate so as to be adapted for slight movement relatively thereto.

4. A dry shaver comprising a pair of relatively movable members each provided with cutting teeth and the teeth of one member being slidably superposed on the teeth of the other member, and means for maintaining said teeth of said respective members in sliding engagement, said means comprising a coil spring secured at each end to one of said members, and one end of said spring being mounted relatively to the member to which it is secured so as to be positionally self-adjusting in all directions in a plane substantially at right angles to its direction of pull.

5. In a dry shaver, a pair of relatively movable members provided with coacting cutting teeth, and tension means for drawing said members together so as to hold their teeth in coacting relation, said tension means being in the form of a coil spring having one end anchored to each of said members, and said anchorage to one of said members comprising an outwardly opening recess, a transverse recess intersecting said first recess and opening outwardly at at least one end thereof, a pin mounted in said last recess and having its ends slidably therein, and said coil spring having its ends slidably mounted on said pin.

GODFREY DALKOWITZ. 35