May 5, 1942. G. DALKOWITZ 2,281,922

SHAVING DEVICE

Filed June 22, 1937

Fig. 1.

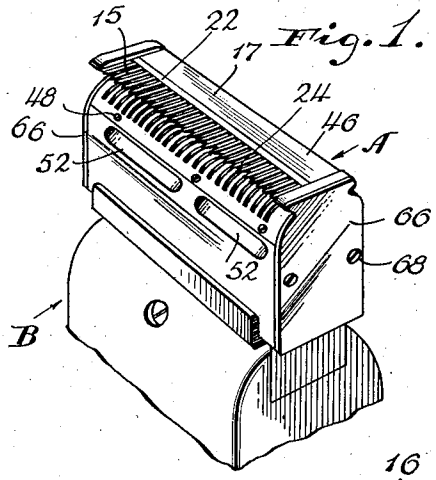


Fig. 2.

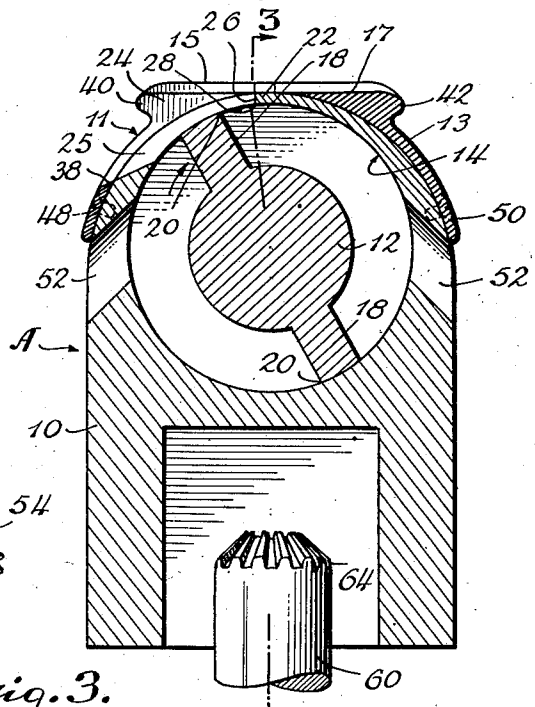


Fig. 5.

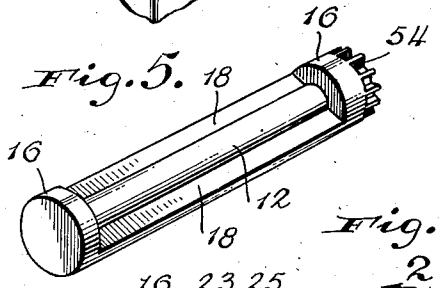


Fig. 3.

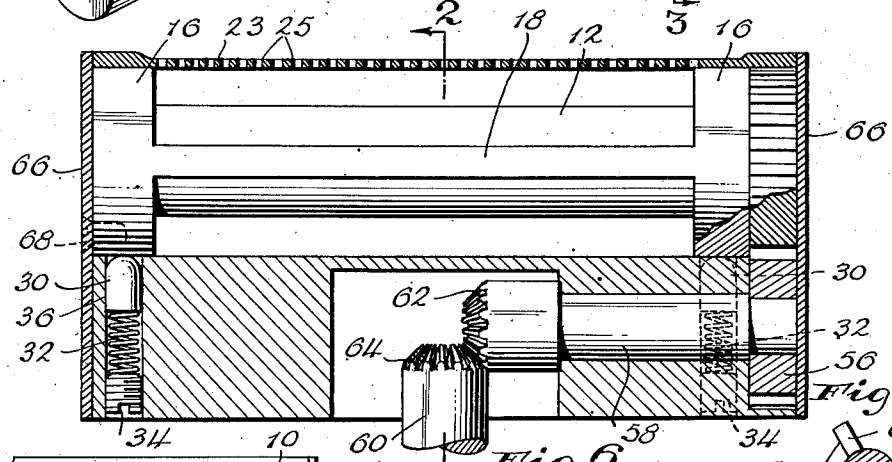


Fig. 7.

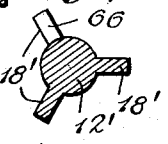
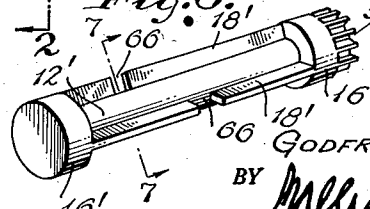


Fig. 6.



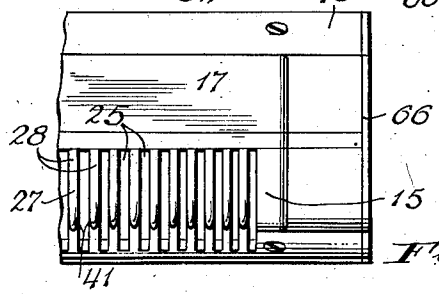


Fig. 4.

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SHAVING DEVICE

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3 Claims. (Cl. 30—43.5)

This invention relates to "dry shaving" devices, that is, to shaving devices in which hair cutting operation is effected without treatment of the hair preliminary to or during the shaving operation such as by the application of shaving cream or soap. In particular it relates to the type of dry shaver in which the cutting action is effected by relatively movable cutting edges.

While my invention has been disclosed in connection with dry shavers it will be understood that it may have other applications.

Among the objects of my invention may be mentioned the provision in a dry shaver of a member provided with a plurality of cutting edges and a cutting element rotatable relatively thereto; the provision in a dry shaver of a member provided with a plurality of elongated slots having cutting edges on the walls thereof and a cutter having cutting edges thereon and rotatable relatively to said cutting edges of the slots; the provision in a dry shaver of a member provided with a plurality of slots closed at one end and having cutting edges on said closed ends, and a cutter having a cutting edge extending transversely of said slots and movable across said cutting edges of the slots; the provision in a dry shaver of a shear plate having therein a plurality of slots closed at one end and provided with cutting edges at said closed ends and a cutter movable in relation to said shear plate in a direction longitudinally of said slots; the provision in a dry shaver of a substantially flat surface adapted to contact with the surfaces to be shaved, slots provided in said surface and said slots having cutting edges on their walls positioned in close adjacency to the surface to be shaved, when the dry shaver is in use, and a cutter mounted for rotational movement in the direction of said slots; the provision in a dry shaver of a shear plate and a guard member provided with slots having guiding portions for guiding hairs toward the cutting areas of the shear plate; the provision in a dry shaver of an elongated rotatable cutting element having longitudinally disposed cutting edges; and the provision in a dry shaver of a rotatable elongated cutter having peripheral spaced sets of cutting edges, the cutting edges of each set being arranged in longitudinal spaced alignment.

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

Figure 1 is a view in perspective of a cutting mechanism of a dry shaver according to my invention;

Figure 2 is a transverse sectional view on the line 2—2 of Figure 3 looking in the direction of the arrows, this view being on a slightly larger scale than Figure 3;

Figure 3 is a longitudinal sectional view substantially on the line 3—3 of Figure 2, on a slightly reduced scale;

Figure 4 is a fragmentary top plan view of my dry shaver;

Figure 5 is a view in perspective of the cutter thereof;

Figure 6 is a view in perspective of a modified form of cutter; and

Figure 7 is a sectional view on the line 7—7 of Figure 1, on an enlarged scale.

On referring to Figure 1 of the drawing it will be observed that I there show in perspective a dry shaver mechanism according to my invention denoted collectively by the letter A, while a portion of a handle for the same, which may be of any suitable or preferred type, and which may include actuating mechanism is denoted by the letter B.

The details of the shaving head A are illustrated with more particularity in Figures 2, 3, 4 and 5, and from these figures as well as from Figure 1 it will appear that my shaving head comprises first of all a casing 10, which is fixed in relation to the handle, having therein a rotatable cutter 12. The cutter is mounted for rotation within the cylindrical bore 14, and is provided with suitable journal portions 16 at or near its ends and with longitudinally arranged cutting blades 18 having cutting edges 20 thereon that are adapted to cooperate with cutting edges provided in the casing, as will be hereinafter explained, to effect the shaving operation.

Attached to the outside of the casing, for the purpose of providing a flattened surface for contacting a surface to be shaved, are shown a pair of members 11 and 13, which I may term guard members. The members 11 and 13 are shown as covering substantially the entire upper surface of the casing and only a small portion 22 of the latter is shown exposed between them, and the upper surfaces 15 and 17 of these guard members are shown as tangential to this uncovered portion 22 of the casing, so that in effect a single flat surface is formed which is adapted to contact the surface to be shaved.

The member 11 is shown as provided with transverse slots 24 which are in superposed registration with slots 25 of the casing, and these

slots serve to space complementary ribs or teeth 23 and 29, the former on the casing, the latter on the guard. The slots 24 of the member 11 are shown as running completely through the upper portion thereof and as terminating near the lower edge thereof, while the slots 25 of the casing are shown as coterminous with the slots 24 of the guard member 11. The walls 26 that close the upper ends of the slots 25 are shown as provided with cutting edges 28 and these cutting edges are adapted to cooperate with the cutting edges 20 of the cutter to sever hairs introduced into the slots 24 and 25. It will be observed that the walls of the casing at this point are thin, so that the cutting will take place very near the surface to be shaved, and a close shave may be effected.

To provide an effective entrance portion for the slots which will enable them to receive hairs and guide them toward the cutting edges and also to prevent injury to the flesh of the user during the shaving operation the guard member 11 is provided with a rounded nose or shoe portion 40, and in addition, the walls of the slots are shown as flared outwardly at their entrance portions as indicated at 41, as can be clearly seen from Figure 4.

The member 13 is shaped similarly to the member 11 but is not provided with slots; it is however also provided with a rounded nose or shoe portion 42 that serves to prevent injury to the user this being necessary because of the customary forward and backward movement of the dry shaver over the surface to be shaved.

It will be understood that in operation the razor is to be moved over the surface to be shaved in the direction of the slots and with the slotted portion in advance, so that hairs enter the flared portion 41 of the slots and are guided toward the cutting edge 28. This movement constitutes the most effective portion of the cycle of operations and the customary backward movement is of little effect, and may, if desired, be replaced by a movement in which the dry shaver is lifted away from the surface to be shaved.

While the guard member 11 and the member 13 are shown as removably attached to the casing by the screws 48 and 50, it will be understood that this construction is only shown by way of illustration, and that my invention also contemplates the making of these members integral with the casing or permanently attached thereto.

In order to secure proper contact of the cutting edges 20 of the cutter and 28 of the slots, means are shown in the form of plungers 30 pressed into contact with the journals 16 by coil springs 32 adjustable by set screws 34, all of these parts being located within suitable bores 36 in the lower portion of the casing and so arranged that the plungers in taking up the looseness in the journals 16 press the cutter against the upper wall of the casing so that the cutting edges 20 thereof come into sliding contact with the cutting edges 28 of the slots.

Reverting again to the slotted portion of the casing, which may be termed the shear plate, and to the guard member 11, it will be observed that the composite slots 24 and 25 increase in depth outwardly from the end wall 26 of the slots which are located at one side of the flattened portion 22. It is at this point that hairs enter the slots and in order to cause effective entry of the same, they are made with flared outer portions as shown clearly in Figure 4 in which the teeth or ribs between slots are shown at 41 as having their outer portions tapered. With this construction as the shaver is moved over a surface to be shaved, such as the face, any hair that is encountered by the shaver will enter one or the other of the slots at its flared portion 41 and will ultimately reach the cutting edge 28 of the shear plate portion of the casing at which point it will be subjected to the cutting action of the cutting edges 20 and 28.

The slots 24 and 25 are shown as extended well down the side of the guard member and casing and to a point 38 at the side of the casing, and consequently they are adapted to receive hairs of considerable length.

For the purpose of permitting the escape of shaving wastes from the bore 14, I have shown openings 52 in the side walls of the casing.

It will be understood, of course, that the cutter 12 may be rotated by any suitable mechanism connecting it to a source of motive power. For this purpose I have indicated by way of example, a toothed gear 54 on the end of the cutter, which is adapted to engage with a toothed gear carried by an arbor 58 journalled within the head 10 and connected to a drive shaft 60 by intermeshing gears 62 and 64.

For the purpose of closing the bore 14 and also preventing endwise movement of the cutter 12, I have shown a plate 66 at each end of the casing 10, and fastened thereto by any suitable or preferred means, as by the screws 68.

In Figures 6 and 7 I have shown a modified form of cutter. In these figures, parts having the same functions as the parts of the cutter of Figure 5 have been denoted by the same numerals primed, and it will be unnecessary to further refer to them. It will be observed however that the cutters 18' are shown as divided into sections by a slot or opening 69 in each and that the slots 66 in the respective cutting plates 18' are out of alignment in relation to each other. Where three cutting blades 18' are used, as shown in Figures 6 and 7, the slots in all three blades are out of alignment. This construction serves to reduce the friction of the cutter against the walls of the casing, and by placing the slots out of alignment the wear is equalized.

While I have shown and described several illustrative embodiments of my invention, it will be understood that the same may be embodied in many other forms such as will be obvious to those skilled in the art without departing from the spirit thereof, and that the disclosure herein is by way of illustration only and is not to be construed in a limiting sense, and that I do not limit myself in any way 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. A shaving device comprising a casing having a cylindrical bore, a substantially flat surface adapted to contact with the surface to be shaved, associated with said casing, said surface being interrupted by a plurality of parallel slots closed at one end, cutting edges formed on the closed ends of said slots and a cutting member mounted for rotation within said cylindrical bore and having cutting edges adapted to coact with the cutting edges of said slots for effecting a cutting action on hairs entering said slots.

2. A shaving device comprising a casing hav-

ing a cylindrical bore, a substantially flat surface adapted to contact with the surface to be shaved associated with said casing, said surface being interrupted by a plurality of parallel slots closed at one end, cutting edges formed on the closed ends of said slots and a cutting member mounted for rotation within said cylindrical bore and having cutting edges adapted to coact with the cutting edges of said slots for effecting a cutting action on hairs entering said slots and resilient means for keeping said cutting edges of the cutting element and the casing in contact during the rotation of said cutting member.

3. A dry shaving razor comprising a head, a curved blade of decreasing thickness terminating in a shearing edge on said head, the inner surface of said blade being cylindrical, eccentric to the outer surface of said blade and defining a portion of a non-circular bore in said head, a cutter member loosely journaled in said bore for rotary movement and movement toward and away from said shearing edge, bearing members on said cutter having a diameter substantially equal to the diameter of the cylindrical surface, resilient means urging said cutter toward said shearing edge, and said bearing members into engagement with said cylindrical surface, and means for rotating said cutter.

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