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SHAVING DEVICE

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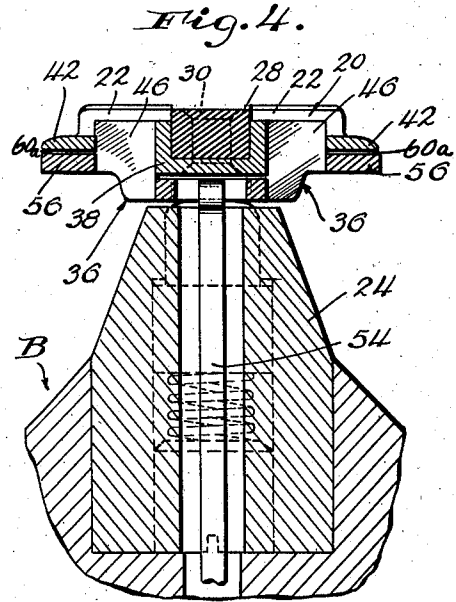
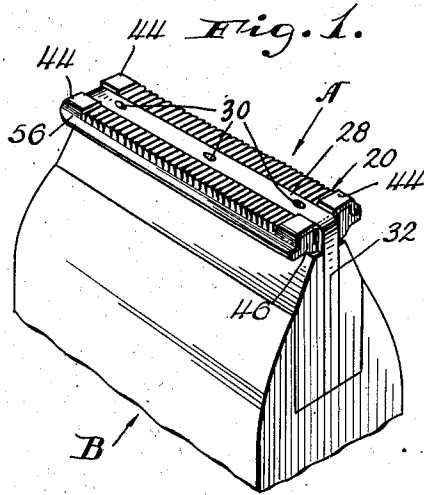


Fig. 2.

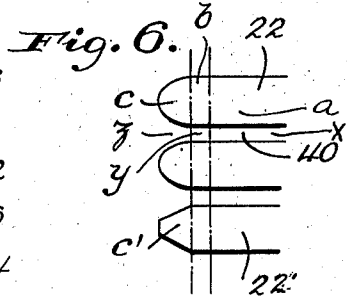
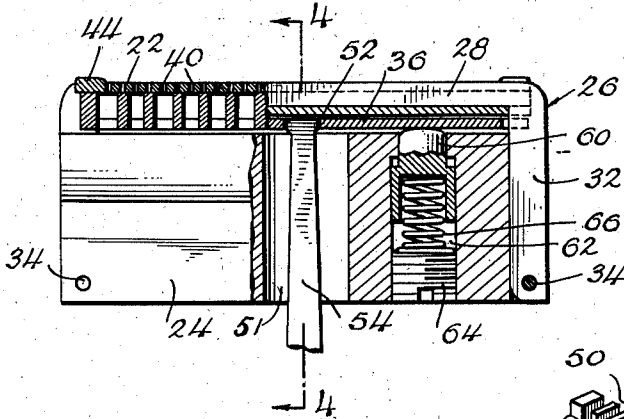
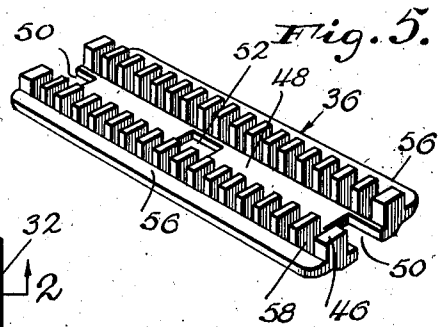
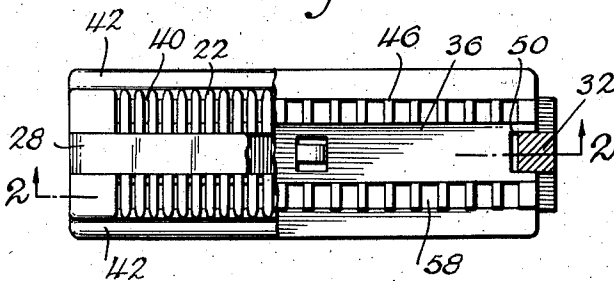


Fig. 3.



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SHAVING DEVICE

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9 Claims. (Cl. 30—43)

This invention relates to shaving devices and in particular to shaving devices in which the shaving operation is effected by the interaction of relatively movable cutting edges so as to effect the cutting or shearing of hairs passing between them.

While my invention has been disclosed herein in relation to shaving devices it will be understood that as to certain phases thereof it may have other applications.

Among the general objects of my invention is the provision in a shaving device of a construction in which to efficiency of action and convenience and ease of manipulation are added low cost of manufacture, of operation, and of maintenance.

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

Figure 1 is a perspective view of said embodiment of my invention;

Figure 2 is a longitudinal sectional view through the shaving head of Figure 1 taken substantially on the line 2—2 of Figure 3, looking in the direction of the arrows;

Figure 3 is a plan view thereof;

Figure 4 is a sectional view, on an enlarged scale, substantially on the line 4—4 of Figure 2 looking in the direction of the arrows;

Figure 5 is a view in perspective of the cutter of the shaving head of Figure 1; and

Figure 6 is a plan view on an enlarged scale illustrating the conformation of the fixed cutting teeth of the shaving head of Figure 1.

Referring to the drawing, it will be observed that I show at A a shaving head mounted in a handle B. The latter, which is not included in my invention, may be of any suitable or preferred type, such as, for example, a casing enclosing an electric motor for actuating the parts of my shaving head.

The shaving head A comprises in general a fixed part and a movable part, and each of these parts is provided with cutting teeth, the edges of which cooperate in a shearing or clipping action.

The fixed part, above referred to, is shown as constituted by a shear plate 20, which carries the fixed cutting teeth 22, and which is secured to a base block 24 by a U-shaped member 26 having its bight portion 28 secured in any suitable or preferred manner, as by rivets 30, to the shear plate 20, while its legs 32 are shown as secured to the base block 24 by means such as pins or screws 34.

By making the latter readily removable, it will be observed that the shear plate may be lifted from its seat on the base block for cleaning, or other purposes, and further, that when only one of these fastening means 34 is removed, the other may serve as a hinge about which the shear plate may be swung in relation to the base block, also for cleaning or other purposes, such as removal of the movable cutter 36.

As appears very clearly from Figure 4, the shear plate 20 is shown as having a centrally located channel portion 38 within which is located the bight portion 28 of the aforementioned U-shaped member 26 and it will be noted that the depth of the channel portion 38 is shown as such that the upper surface of the portion 28 is substantially flush with the top of the shear plate.

Extending laterally on each side of the channel portion 38, just described, are shown horizontal portions which are traversed by slots 40 that break up these portions into the teeth 22, already referred to. These slots and teeth are continued into vertically disposed portions of the shear plate that depend from the aforementioned horizontal portions, and the extreme sides of the shear plate are formed by a pair of flanges 42 extending outward from the lower ends of the aforesaid vertical portions.

The teeth 22 are provided with cutting edges on their inner surfaces, where these surfaces intersect the slots, and for the purpose of obtaining a close shave, the teeth 22 may be made very thin, while to counterbalance the weakening of the shear plate due to its thinness, reinforcing portions 44 may be provided. It will be seen that the shear plate may be produced from sheet material, which will tend to lower production costs, the reinforcing portions in this case having the thickness of the original sheet, while the teeth 22 have a portion thereof ground away.

Within the downwardly opening channels, resulting from the shear plate configuration just described, are slidably positioned the cutting teeth 46 of the movable cutter 36, the upper or inner surface of which may be described as being complementary to the inner surface of the shear plate, and this cutter comprises besides the teeth 46 already mentioned, a central portion 48 having recesses 50 at its ends within which are received the legs 32 of the aforementioned U-shaped member 26, and which permit the cutter to reciprocate freely, and with an opening 52, adapted to receive the end of a lever 54 extending from the casing or handle B and through an

opening 51 in the base block 24, by which movement is imparted to the cutter 36.

The cutter 36 is further provided with flanges 56 extending outwardly from the teeth 46 and positioned beneath the aforementioned flanges 42 5 of the shear plate.

Openings 58 are provided between the teeth 46, through which the shaving waste may escape from the cutting area, that is from the contacting surfaces of teeth 46 and 22 through the cutter 36 and to a point exterior to the shaving head. It will be understood of course that the teeth 46 are formed with cutting edges at those points where they contact with the teeth 22 of the shear plate.

In the operation of the device it will be observed that as the shaving head is moved over the face or other surface to be shaved in the general direction of the slots 40, that hairs will enter the vertical portions of said slots and will finally reach the cutting zone where the teeth 22 and 46 interact. Due to the height of the aforementioned vertical portion it will be seen that relatively long hairs may enter the slots 40 without bending. It will further be observed that due to the wider spacing of teeth 46 the slots 40 will seldom be obstructed, and the hairs may pass with comparative freedom into the cutting zone, and the severed hairs will pass through openings 53 between the teeth 45 of the movable cutter to the exterior of the shaving head.

In order to subject as many hairs as possible to the cutting action, I have further shown the vertical portions of the slots, which are at the same time the entrance portions thereto, with widened entrance portions, as may be clearly seen from Figure 6, which is a plan view on an enlarged scale of the teeth, 22 and it will be observed that the teeth 22 are shown as divided along their length into three zones designated as *a*, *b*, and *c* respectively. The first of these corresponds to the tooth portions lying within the cutting zone, that is those portions overlying the teeth 45 of the movable cutter, and it will be observed that the intermediate slot portions are relatively narrow and substantially of uniform width.

The portions *b* form a continuation of the portions *a*, but they lie outside of the cutting zone, and form a region of transition between the portions *a* and the outwardly tapering portions *c* of the teeth, and serve to prevent the flesh from entering the cutting zone.

The slots 40 are correspondingly divided into three zones *x*, *y* and *z*, the first lying in the cutting zone, the second lying outside of the cutting zone, but being of substantially the same width as the zone *x*, while the third, *z*, is flared outwardly and serves to receive in its wide mouth, a great proportion of the hairs encountered, which it then guides into the narrower portion *y*, from which they enter the cutting zone portion *x*.

At *c'* I have indicated an alternative tooth form, in which the side walls of the tapered end portions *c'* of a tooth 22' are shown as being straight. The functioning of this form is substantially identical with that of the rounded wall form.

The proper functioning of the device is obviously dependent on shearing contact between the fixed and the movable cutting teeth, and for the purpose of securing such contact I have shown means in the form of a plug or plunger 60 slidable in a recess or bore 62 within the base block

24, which is closed by set screw 64. Between the latter and the plug 60 is positioned a compression spring 66 that serves to urge the plug 60 against the lower wall of the movable cutter 36, thereby pressing it against the shear plate.

It will further be observed that to insure contact at the desired place, that is at the cutting edges, I have shown at 60*a* in Figure 4, the portions of the movable cutter other than at the cutting teeth as spaced slightly from the opposed shear plate surfaces, which serves to reduce friction, to compensate for wear in the cutting teeth and prevent undesired contact of these surfaces, which might prevent contact of the cutting teeth.

While I have herein disclosed one embodiment of my invention it will be understood that the same 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 herein is by way of illustration merely and is not to be construed in a limiting sense, and that I do not limit myself other than as called for by the prior art and the scope of the claims.

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 face engaging shear plate for a dry shaver a side wall, a lower flange extending laterally outward from the lower edge of said wall and having a free outer edge and an upper wall extending inwardly from the upper edge of the wall, said upper wall and a portion of said wall extending for a substantial distance below the lower surface of said upper wall being transversely slotted.

2. In a face engaging shear plate for a dry shaver a side wall, a lower flange extending laterally outward from the lower edge of said wall and having a free outer edge and an upper flange extending inwardly from the upper edge of the wall said upper wall and said wall being transversely slotted.

3. A dry shaver having a base, a guard member provided with a central channeled portion U-shaped in transverse cross section and having two rows of parallel teeth projecting laterally from the free edges of the channel of said channeled portion, means free at its outer portion uniting the outer edges of said teeth and a U-shaped member having its intermediate section secured within said channel and its legs received within a channeled portion in the base member, the end of at least one leg being pivoted in the base member, and a movable cutting member adapted to coact with said stationary cutting member in a clipping action, positioned between said stationary cutting member and said base.

4. In a dry shaver, a stationary cutting member provided with a longitudinally extending channeled portion, and toothed areas extending laterally on each side thereof, each of said areas comprising a horizontal portion immediately adjoining said channeled portion, a vertical portion extending downwardly from the free end of said horizontal portion, and a horizontal portion extending outwardly from the free end of said vertical portion, and said first named horizontal portion and said vertical portion being traversed by slots so as to form transverse cutting teeth while said second mentioned horizontal portion is unslotted, whereby it serves to unite and to rigidify said cutting teeth, and said second hori-

zontal portion being supported only from the vertical portion.

5. In a dry shaver, a stationary cutting member as set forth in claim 4, having a solid reinforcing member secured in place within said channel portion.

6. In a dry shaver, a cutting member movable relatively to a second cutting member, said movable cutting member comprising a central horizontal portion, a row of teeth, on each side of said central portion and extending above the plane thereof, and a horizontal portion serving to unite the bases of the teeth of each row extending outwardly from the lower, outer surfaces of the teeth of each row, said last named portion being supported only by said teeth.

7. In a dry shaver, a stationary cutting member as set forth in claim 4, in combination with a relatively movable cutting member, said movable cutting member comprising a central horizontal portion, a row of teeth, on each side of said central portion and extending above the plane thereof, and a horizontal portion serving to unite the bases of the teeth of each row extending outwardly from the lower, outer surfaces of the teeth of each row, said last named portion being supported only by said teeth.

8. In a dry shaver a stationary cutting member as set forth in claim 4 and having a solid reinforcing member secured in place within said channeled portion, in combination with a relatively movable cutting member, said movable cutting member comprising a central horizontal portion, a row of teeth, on each side of said central portion and extending above the plane thereof, and a horizontal portion serving to unite the bases of the teeth of each row extending outwardly from the lower, outer surfaces of the teeth of each row, said last named portion being supported only by said teeth.

9. In a face engaging shear plate for a dry shaver a side wall, a lower flange extending laterally outward from the lower edge of said wall and having a free outer edge and an upper wall extending inwardly from the upper edge of said wall, said upper wall and a portion of said wall extending for a substantial distance below the lower surface of said upper wall being transversely slotted, the portions of the slots on the slotted side wall having their outer ends widened by removing the material bounding said slots.

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