July 14, 1942. G. DALKOWITZ 2,289,875

SHAVING APPLIANCE

Filed May 23, 1938

Fig. 1.

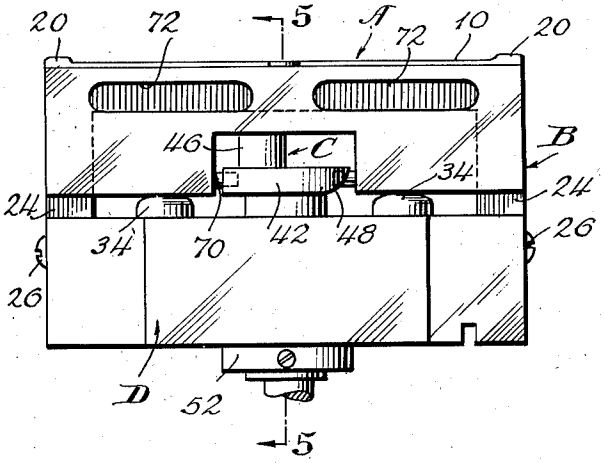


Fig. 5.

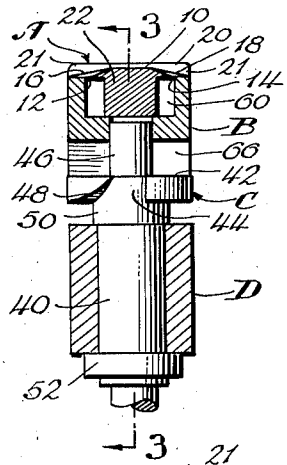


Fig. 2.

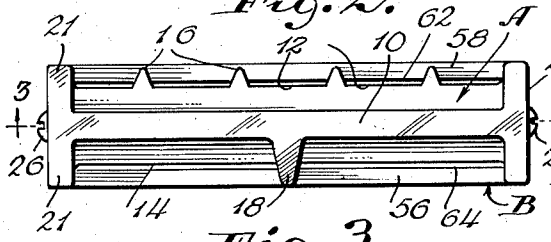


Fig. 6.

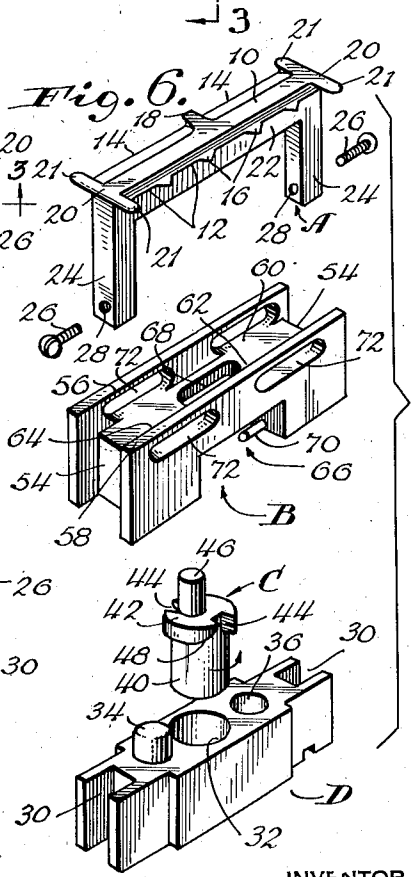


Fig. 3.

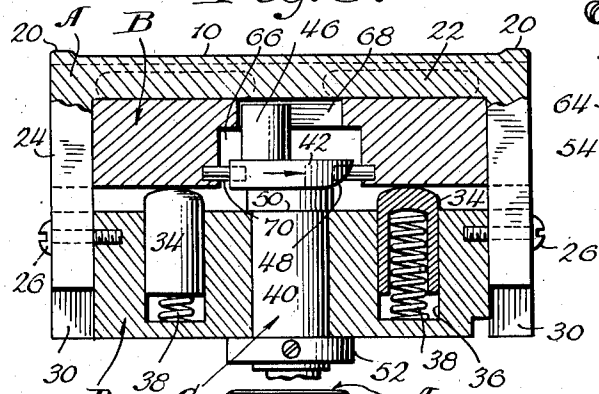
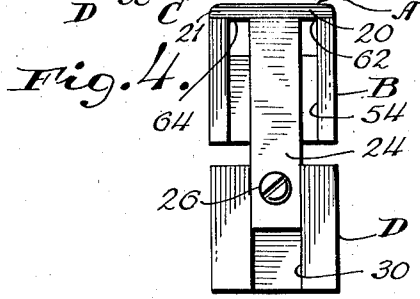


Fig. 4.



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UNITED STATES PATENT OFFICE

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SHAVING APPLIANCE

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Application May 23, 1938, Serial No. 209,452

9 Claims. (Cl. 30—43)

This invention relates generally to shaving appliances and more particularly to the type of shaving appliance known as a dry shaver in which the shaving operation is effected by the clipping or cutting action of relatively movable cutting edges and without previous preparation of the surface to be shaved as by the application of shaving creams and the like.

The general object of my invention is the provision in a dry shaver of a simple construction that is convenient and effective in operation and is easy and inexpensive to manufacture.

Among the more particular objects of my invention is the provision in a dry shaver of a pair of members each carrying one or more cutting edges that are relatively movable into operative engagement by a bodily movement of one of said members relatively to the other which movement is of such nature that each part of one member is displaced in relation to the other member.

Another of the objects of my invention is the provision in a dry shaver of a pair of relatively movable members each provided with one or more cutting edges adapted to coact in a cutting operation and one of said members being bodily movable relatively to the other in a closed path.

Among the more particular objects of my invention is further the provision in a dry shaver of a pair of relatively movable members each provided with one or more cutting edges adapted to coact in a cutting operation and one of said members being bodily movable relatively to the other in a closed path lying in a plane.

Still another object of my invention is the provision in a dry shaver of a pair of relatively movable members each provided with one or more cutting edges adapted to coact in a cutting operation and one of said members being bodily movable relatively to the other in a closed path lying in a plane perpendicular to the cutting edge of the other member.

Also among the particular objects of my invention is the provision in a dry shaver of a pair of relatively movable members each provided with one or more cutting edges adapted to coact in a cutting operation, and one of said members being bodily movable relatively to the other in a path portions of which lie in two spaced planes, while other portions lead from one of said planes to the other.

A still further object of my invention is the provision in a dry shaver of a pair of relatively movable members each provided with a cutting edge and said members being movable relatively to each other in such a manner that one cutting edge moves toward the other in one plane and thereafter moves away from the cutting edge and returns toward its initial position in said plane by a return path having part thereof lying in a plane spaced from said first plane.

These objects and such other objects as will hereinafter appear or be pointed out are attained in the illustrative embodiment of my invention shown in the drawing, in which—

Figure 1 is a side elevation of my improved shaver head;

Figure 2 is a plan view thereof;

Figure 3 is a transverse cross-sectional view substantially on the line 3—3 of Figures 2 and 5, looking in the direction of the arrows;

Figure 4 is an end view of the shaver head of Figure 1;

Figure 5 is a transverse cross-sectional view substantially on the line 5—5 of Figure 1, looking in the direction of the arrows; and

Figure 6 is an exploded view of the parts of the dry shaver head, each part being shown in perspective.

Referring now to the drawing for a detailed disclosure of the illustrative embodiment of my invention, it will be observed, as may be clearly seen from Figure 6, that my shaver head comprises four main parts, namely a fixed cutter A, a movable cutter B, an actuating member C, and a base block D.

The fixed cutter A comprises a thin plate-like upper member 10 that may be termed the shear plate, and that is beveled along its longitudinal sides so as to form cutting edges 12 and 14. The lower face of the shear plate 10 is flat in order that it may serve as a sliding seat for the upper surface of the cutter B, as will hereinafter appear.

The cutting edges 12 are shown as separated from each other by a plurality of lugs 16 while the cutting edges 14 are shown as separated from each other by a single lug 18. The function of the lugs 16 and 18 is the same; they serve merely to protect the cutting edges from impact thereagainst of the movable cutter by providing additional guiding surfaces in advance of the cutting edges.

It is to be understood that instead of having the lugs of the two sets of cutting edges differently arranged, as shown, that both sets may be identical, and that the number of lugs 16 and 18 may be any number desired, the actual showing being, by way of illustration merely, of two of the many possible arrangements.

Additional guiding surfaces for the movable cutter are to be found on the lower surfaces of two transversely extending ribs or bars 20, one of which forms each end of the shear plate 10, and the ends 21 of these bars extend beyond the cutting edges 12 and 14. The ribs 20 serve the additional purpose of reinforcing the shear plate and rigidifying the beveled portions thereof.

Extending longitudinally underneath the shear plate 10 is a rib 22, and this rib is of a restricted width so as to allow the cutting edges 12 and 14 to overhang the same to a sufficient extent to permit the cutting edge carrying portions of the movable cutter B to pass underneath the same as may be seen in Figure 3, and as will be more fully understood as the description proceeds.

Depending from the rib 22 at each end thereof is a leg 24. The two legs 24 serve for mounting the stationary cutter A on the base block D in such a manner that the rib 22 of the stationary member is spaced from the block D to such an extent that room is provided for the accommodation of the movable cutter B. For this purpose any suitable or preferred means may be provided for securing the legs to the base block, such as a pair of screws 26 adapted to pass through openings 28 in the legs 24 and to enter threaded openings provided in the base block D.

In order to secure accurate positioning of the stationary member in relation to the base block the latter may be provided with vertically extending grooves 30 in which the legs 24 are slidably received.

The base block D is provided with an opening 32 through which the stem of the actuating member C may extend and it is further provided with spring plungers 34, slidable in bores 36 and urged in an upward direction so that their ends tend normally to project outwardly therefrom by coil springs 38.

The actuating member C comprises a stem portion 40 adapted to pass through the opening 32 and carrying a head 42 provided with a pair of diagrammatically opposed slots 44, and on the head is mounted an eccentric pin 46. Portions of the lower surface of the head 42 adjacent one side of each of the slots 44 are formed into inclined cam surfaces 48 for a purpose that will appear hereinafter.

For the purpose of my invention the head 42 must be rotatable and fixed against axial and radial movement relatively to the base block D, and for this purpose the opening 32 may receive the stem 40 in close engagement so as to form a bearing therefor, and thrust collars 50 and 52 may be provided thereon to prevent axial movement. The stem 40 is attached to a rotating member such as a rotating drive shaft driven from any suitable or preferred source of power.

As can best be seen from Figure 3 the movable member B is positioned in a space bounded on its upper side by the shear plate 10, on its lower side by the base block D, and at its ends by the legs 24. The legs 24 of the member A are shown as positioned in grooves 54 provided in the ends of the movable member B, and as slidably engaging the walls thereof so as to prevent endwise movement of the member B, but the grooves 54 are of such width that the member B may move transversely to the legs and to the shear plate. Upward movement of the movable member B is limited by the engagement of the shear plate and its lugs 18 and 16 and the extensions 21 of the ribs 20, and this upper surface of the member B is shown as comprising two portions 56 and 58 separated from each other by a longitudinally extending groove 60. At the meeting of the lateral walls of this groove and the portions 56 and 58 are formed cutting edges 62 and 64.

A recess 66 is provided in the bottom of the member B and this recess is large enough to accommodate the head 42 of the operating member C, and in the upper wall of said recess is provided a slot 68 that is adapted to receive the end of the eccentric pin 46 and is of the same width as the pin but of a length exceeding the travel of the pin, so that as the pin rotates it will cause transverse movement of the member B but not longitudinal movement thereof.

It will further be observed that the member B may move downwardly against the resistance of the plungers 34, which press against its lower surface, from its normal position in which it is in contact with the shear plate 10.

My invention contemplates in addition to the transverse movement of the member B, as effected by the engagement of the eccentric pin 46 with the walls of the groove 68, a downward movement thereof, and for this purpose I have shown the member B as provided with a pair of pins 70 extending into the recess 66 and of such length and so positioned that they may be received in the slots 44 of the head 42. The vertical height of the pins 70 is such that the cam surfaces 48 of the head 42 will engage portions of their upper surfaces, whereby as the head 42 is rotated in a suitable direction there will be a camming action serving to move the pins 70 downward and thereby downward movement of the entire member B is effected.

The operation of the device will now be clear. It being remembered that the operating member C is held against axial movement as well as radial movement and assuming as the initial position the one shown in Figures 1, 2, 3 and 5 in which the pins 70 are in the slots 44 of the operating member, so that, due to the action of the plungers 34 the member B is in its normal position with its upper surface engaging the shear plate 10 and the member B is at the same time in its midposition transversely considered, it will be observed that movement of the member 42 in a direction to cause the cam surfaces 48 to ride over the pins 70, will first of all cause a transverse movement of the member B during which it is in sliding engagement with the lower surface of the shear plate 10, and which movement, as can be seen in Figure 2 will first of all cause the edge 62 to come in contact with and to pass underneath edges 12 in sliding contact therewith whereby a cutting action is effected. This transverse movement is due to the movement of the eccentric pin 46, which has its maximum transverse speed in the position of Figure 5, and which because of its engagement with slot 68 carries the member B with it in a transverse direction. After the cutting edges have passed each other the cam surfaces 48 act on the pins 70 so as to move the member B and its cutting edges downward and out of contact with the shear plate, and the pins 70 and consequently the entire member B are held at a lower level in which the pins 70 engage the lower surfaces of the head 48, and the member B remains at this level until the pins 70 again reach the slots 44, when the member B is suddenly released from the head 42, and, urged by the plungers 34 it snaps upwardly into engagement with the shear

plate and into a position in which the cutting edges 64 and 62 are positioned outwardly of the cutting edges 12 and 14 as in Figure 5.

Because of the fact that the eccentric pin 46 is now moving across the shaver head in a direction opposite to that of its previous transverse movement as just described, the cutting edge 62 instead of moving toward the edges 12 will now move away from them until the approaching cam 48 again depresses the member B into its lower plane in which it remains until the pins 70 again enter the slots 44, after which the cycle just described is repeated.

The cutting edge 64 in the meantime has been going through a similar cycle but the cycle is displaced by 180° so that while the edge 62 is moving toward the edges 14, the edge 64 is moving away from the edges 12, and vice versa.

It will be observed that the path of movement of any portion of the movable member B may be roughly compared to a distorted figure eight laid on its side, the movable member B rising upwards twice during the cycle, and during each rise one of the cutting edges 62 and 64 is active, while the other one is inactive.

Openings 72 are shown in the walls bounding the channel 60 through which the shaving waste that accumulates in the channel may be discharged.

While I have herein disclosed one illustrative 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 interpreted in a limiting 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. A shaving head having a fixed shear plate provided with a cutting edge, a rib on the lower surface of said shear plate, depending legs carried by said shear plate, a base block having grooves therein adapted to receive said legs so as to leave a space between said shear plate and said block, a movable cutter provided with a cutting edge positioned in said space and having a groove on the upper surface thereof, and said rib of the shear plate extending into said groove, resilient means carried by said block for urging said cutter into engagement with the shear plate and means for actuating said cutter extending through said base block and into engagement with said cutter, and said cutter and actuating means being provided with cooperating portions to effect an active cutting movement of the cutting edge of the cutter across the cutting edge of the shear plate and a movement of the cutter away from said shear plate, against the resistance of said resilient means.

2. A shaving head provided with a shear plate and a cutter movable toward and away from said shear plate and transversely thereto, means for moving said cutter away from said shear plate and for moving it transversely thereto, said means being in the form of a rotatable member provided with cam surfaces for moving said cutter away from said shear plate and an eccentric pin adapted to move it transversely to the shear plate, and means to move said cutter toward said shear plate.

3. In a shaving head, a shear plate, a cutter movable toward and away from said shear plate and transversely thereto, and means for moving said cutter away from said shear plate and for moving it transversely thereto, said means comprising a slot and pins on the cutter and a rotatable member provided with slots and with cam surfaces adapted to engage said pins so as to move said cutter away from said shear plate, and said means also comprising an eccentric pin adapted to engage the slot in said cutter so as to move it transversely to the shear plate.

4. A shaving head provided with a shear plate and a cutter movable toward said shear plate and into contact therewith and away from said shear plate and out of contact therewith and also in directions parallel to said shear plate and means for moving said cutter away from said shear plate and for moving it parallel thereto while out of contact, said means being in the form of a rotatable member provided with cam surfaces for moving said cutter away from said shear plate and an eccentric pin adapted to move it transversely to the shear plate.

5. A shaving device comprising a pair of cutters each having a cutting edge, one of said cutters being provided with seat portions, and the other of said cutters being provided with surface portions adapted to seat slidably on said seat portions, said cutting edges being so positioned that when said other cutter is slid in said seat said cutting edges will coact in a clipping action, and means for moving said other cutter relatively to the first cutter in a sliding movement on said seat, and also in a movement in which it is moved away from its seated position and out of contact with said first cutter for the purpose of affording unobstructed access of hair to the cutting edge of said first cutter.

6. A shaving device comprising a pair of cutters each having a cutting edge, one of said cutters being provided with seat portions, and the other of said cutters being provided with surface portions adapted to seat slidably on said seat portions, said cutting edges being so positioned that when said other cutter is slid in said seat said cutting edges will coact in a clipping action, and means for moving said other cutter relatively to the first cutter in a sliding movement on said seat, and in a movement in which it is moved into positions always parallel to its other positions and out of contact with said seat for the purpose of affording unobstructed access of hair to the cutting edge of said first cutter.

7. In a shaving device a stationary cutter provided with a cutting edge and with a plane seat for slidably receiving thereon a movable cutter, a movable cutter provided with a cutting edge adapted to cooperate with the cutting edge of the stationary cutter and also provided with a seat for sliding engagement with said seat on the stationary cutter, and means for moving the movable cutter slidably on its seat on the stationary cutter and for moving it bodily off said seat in a direction perpendicular to the plane of said seat, and means for maintaining the respective edges on the movable and the stationary cutters in parallelism at all times during said movement, said movement of the movable cutter bodily off said seat permitting unobstructed access of hair to the cutting edge of said first cutter.

8. A shaving head provided with a shear plate and a cutter each having cutting edges thereon and the respective cutting edges being adapted to meet in a clipping action, a mounting for said cutter whereby it is movable translationally and

without rotation towards and away from said shear plate and parallel thereto, means for moving said cutter away from said shear plate and out of contact therewith and for moving it transversely thereto while out of contact, said movements being entirely translational and without rotation, means for moving said cutter toward the shear plate and into contact therewith and means for moving said cutter while it is in contact with the shear plate so that the cutting edges thereof meet in a clipping action with the cutting edges of the shear plate.

9. A shaving head provided with a shear plate and a cutter, each having cutting edges thereon and the respective cutting edges being adapted to coact in a clipping action, a mounting for said cutter whereby it is movable translationally and without rotation towards said shear plate and into contact therewith and away from said shear plate and out of contact therewith and whereby it is also movable parallel to said shear plate while out of contact therewith and while in contact therewith, cam means for moving said cutter translationally away from said shear plate and resilient means for moving it toward the shear plate, and means for moving said cutter translationally parallel to said shear plate both while out of contact therewith and while in contact therewith.

GODFREY DALKOWITZ.