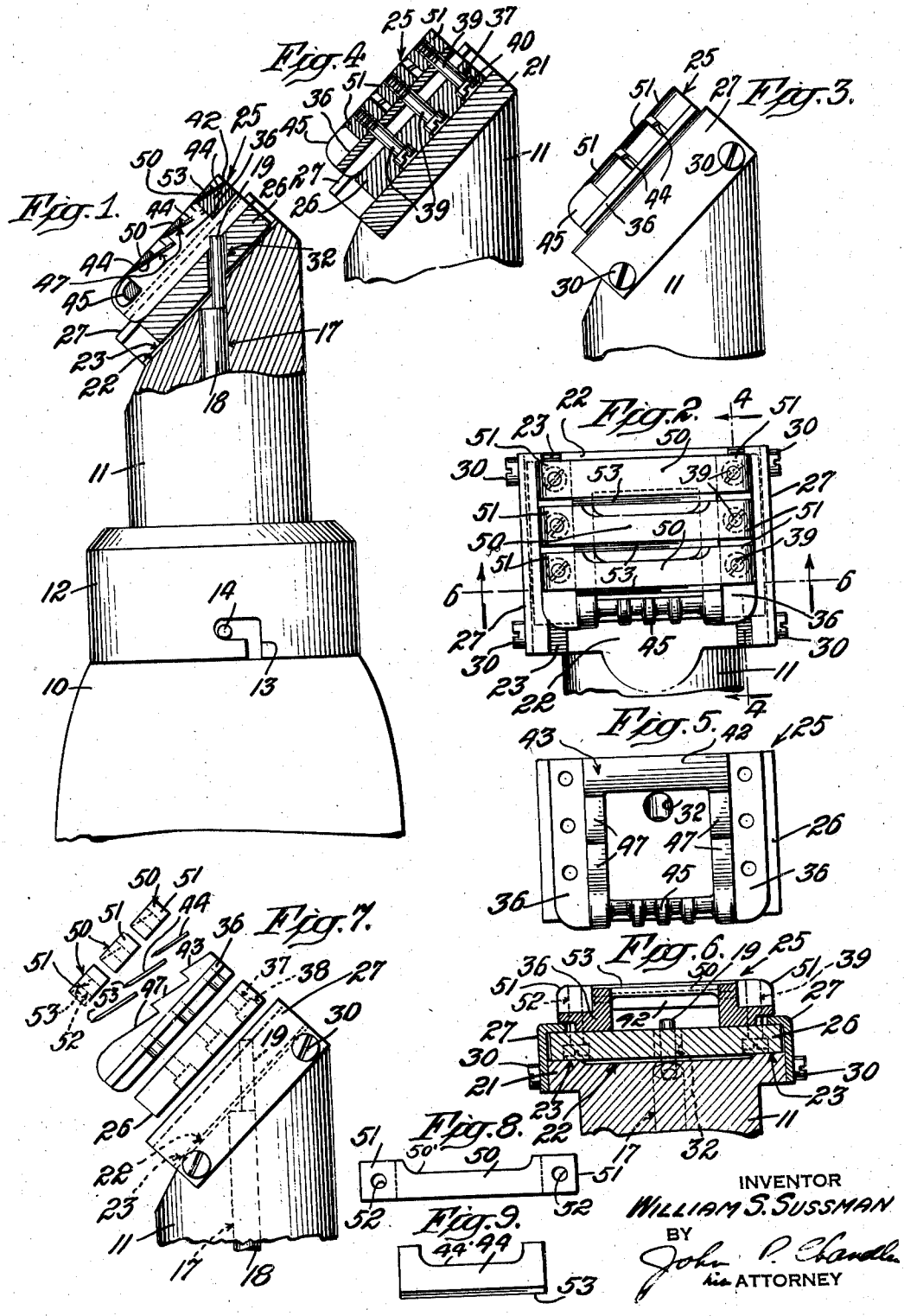
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MECHANICAL RAZOR

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MECHANICAL RAZOR

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This invention relates to new and useful improvements in mechanical razors, and relates more particularly to a shaving implement having a plurality of cutting elements which have a true shaving action as distinguished from motor driven razors generally which provide movable and stationary cutting elements which clip the hairs therebetween.

The preferred embodiment of the present invention comprises a razor having a plurality of spaced cutting elements which are mounted in substantially parallel relation to each other on a blade support. Means are provided for rapidly reciprocating this blade support or carriage at right angles to the respective edges of the cutting elements. The cutters are formed as flat blades and are rigidly mounted on the movable carriage, as aforesaid, at an angle of 15°, more or less, to the plane of movement of said carriage.

This support or carriage is formed with a plurality of spaced recesses which receive such cutting elements or blades, the recesses being of such depth as to permit only the actual cutting edge to project beyond the surface of the movable support. In other words, the blades are provided with no guard other than that formed by the edges of the recesses and the cutting is effected in much the same fashion as it is performed by a straight or safety razor, except, of course, the action is much more rapid.

It is thus apparent that one of the principal objects of the invention is the provision of an improved mechanical razor wherein there is provided a true cutting action and wherein the hairs are severed cleanly and at their bases. Another object of the invention is to provide a razor having a plurality of cutting elements so positioned as to effectively prevent the cutting of the skin of the user, the several cutting edges rapidly severing the hairs so that the entire shaving operation may be performed in a fraction of the time normally required for shaving.

Still another object of the invention is the provision of a razor of this general character wherein the several blades may be quickly removed when they have become dulled through use, and new ones inserted in their places.

In the preferred embodiment of the invention, the blade carriage is mounted for reciprocating movement on a diagonally inclined surface at the upper end of the cutting head in order to facilitate the shaving operation. The device may be actuated by any suitable source of power such as an electric motor or a spring motor, the particular form employed being a matter of choice and forming no part of the present invention.

Another object of the invention is the provision of an improved automatic shaver wherein a plurality of cutters are mounted in a reciprocating blade carriage, only the cutting edges of the blades projecting above the upper surface of the carriage, such upper surface being substantially flat.

The razor constituting the present invention, though motor actuated, is nevertheless not a "dry shaver," since it is primarily adapted to be used after the face has been lathered in the usual fashion.

In the drawing:

Fig. 1 is a side elevation, partially in section, of the preferred embodiment of the present invention;

Fig. 2 is a front elevation of the cutting head of the razor;

Fig. 3 is a side elevation thereof;

Fig. 4 is a vertical section taken on line 4—4 of Fig. 2;

Fig. 5 is a front elevation of the movable support for the cutting elements;

Fig. 6 is a broken vertical section taken on line 6—6 of Fig. 2;

Fig. 7 is an exploded view of the various parts of the cutting head;

Fig. 8 is a plan view of one of the plates for securing the blade in place; and

Fig. 9 is a plan view of one of the blades or cutting elements.

As was earlier pointed out, the present mechanical razor may be driven by any suitable source of power such as an electric motor, spring motor or other prime mover. Since the particular type of power employed forms no part of the present invention, no details thereof are illustrated in the drawing. Such prime mover is adapted to be enclosed within a housing 10 and the cutter head comprises a substantially cylindrical portion 11 provided with a collar portion 12 at its lower end, which collar portion is provided with an angular slot 13 which is adapted to cooperate with a pin 14 at the upper end of the housing 10, thus providing a conventional bayonet type of fastening means for securing the cutting head upon the housing. The cylindrical portion 11 may be formed integrally with the collar portion 12 or they may be made in separate pieces and rigidly secured together. The cylindrical portion 11 is formed with a central vertical aperture 17 which supports a shaft 18 which leads downwardly into the casing 10 and

adapted to be driven by means of the prime mover (not shown) contained within such casing.

At its upper end the shaft 18 is formed with an eccentric cam driver portion 19. At its upper end, the cylindrical portion 11 is formed with opposed extension portions 21 and with a diagonally inclined face 22, the opposed edges of which are formed with narrow raised portions 23, shown clearly in Fig. 6, which form bearing surfaces for a movable plate 26 forming the base of a blade support or carriage 25. This plate 26 is substantially rectangular in shape and is engaged at its opposite terminals on its side and upper edges by means of inverted L-shaped guide plates 27 which are secured at opposite sides of extension portions 21 of portion 11 by means of screws 30. The plate 26 is formed with a diagonally disposed aperture 32 of such width as to permit the cam driver 19 to pass from side to side during its eccentric movement, all as indicated by the broken lines in Fig. 6. The breadth of this aperture, as shown in Fig. 1, is substantially the same as the diameter of the cam driver 19, and accordingly it will be apparent that as the shaft 18 rotates, the eccentric movement of the driving cam 19 will impart reciprocating movement to the blade carriage 25.

Mounted on the upper surface of the plate 26 is a blade support comprising a pair of spaced, opposed angle portions 36 having apertures therein. Plate 26 is further formed with a plurality of apertures 37 therein, the lower terminals of such apertures being enlarged as shown at 38. Such apertures receive screws 39, the heads 40 of such screws residing in the enlarged portions 38 of apertures 37, all as shown in Fig. 4.

The spaced angle portions 36 are connected integrally at their rear terminals by means of a cross piece 42 which is formed with a diagonally inclined upper surface as shown at 43 which receives one of the blades or cutting elements designated as 44. At their forward terminals the angle portions are connected by a guard portion 45. The upper surfaces of the angle portions are formed with a plurality of spaced, aligned diagonal seats 47 which receive the blades 44. The blades are held in place by means of elongated plates 50 having downwardly depending terminal portions 51 having threaded apertures 52 therein. The lower surface 53 of each plate 50 is diagonally disposed, thus clamping the main body of the blade between such surface and the surfaces 47 on angle portions 36.

The blade is so positioned as to permit the cutting edge 53 thereof to lie on the same plane as or to project only slightly above the upper surface of the blade carriage, and such cutting edge is thus effectively guarded against cutting the skin of the user. Such upper surface is thus in contact with the skin during the shaving operation and thus provides a distinct safety factor, particularly since too much pressure against the face retards movement of the carriage. This retarding of movement is more pronounced if a small self-contained spring motor, instead of an electric motor, is positioned within handle 10. It will be noted that the blade 44 and the plate 50 are formed with recesses 44' and 50', respectively, along their rear edges in order to permit the lather from the face to pass underneath the blades during the shaving operation.

It will be apparent that many changes and modifications may be made herein without departing from the spirit of the invention as defined by the appended claims. For instance, the blade carriage may be mounted at the upper end of the cutting head by any other suitable means and various blade securing means, other than that illustrated, may be employed. The blades may also be formed with a small aperture through which a pin may pass, thus securing the blades in place. Also, the blade carriage may be so arranged as to move in a plane which is at an angle other than a right angle to the cutting edges of the blades. A further modification may be in the means for imparting reciprocating movement to the carriage such as by a reciprocating arm of the type used in various dry shavers.

The plane on which the blade carriage is mounted relative to shaft 18 is illustrative only, and it will be appreciated that the blade carriage may lie on any other plane desired.

What I claim is:

1. A mechanical shaving device comprising a blade carriage, a plurality of blades carried thereby in spaced relation to each other, a support for the carriage including guide means disposed at opposite ends of the support to permit reciprocating movement of the carriage at substantially right angles to the cutting edges of the blades, and means comprising a prime mover and a cam drive connected therewith for imparting such movement to the carriage, the carriage having an aperture within which the cam driver is positioned, said carriage being substantially rectangular in shape and having a plurality of diagonally disposed recesses in which the blades are removably positioned, the upper surface of the movable carriage forming a skin-contacting surface, the cutting edges of the blades lying just outside such recesses and on substantially the same plane as said upper surface.

2. A mechanical shaving device comprising a blade carriage, a plurality of blades carried thereby in spaced relation to each other, a flat support for the carriage and including guide means disposed at opposite ends of the support enclosing two opposed end walls and opposed marginal edges of the upper surface of the carriage, and permitting reciprocating movement thereof at substantially right angles to the cutting edges of the blades, and means including a prime mover for imparting such reciprocating movement to the carriage, said carriage being substantially rectangular in shape and having a plurality of diagonally disposed transverse slots in which the blades are removably positioned, the upper surface of the movable carriage forming a skin-contacting surface during the shaving operation, the cutting edges of the blades being positioned just outside the slots and lying on substantially the same plane as said upper surface.

3. A mechanical shaving device comprising a blade carriage, a plurality of spaced blades carried thereby, a support for the carriage including guide means for permitting reciprocating movement of the carriage relative to the support at substantially right angles to the cutting edges of the blades, and means including a prime mover for imparting such movement to the carriage, said carriage being substantially rectangular in shape and having a plurality of diagonally disposed slots extending downwardly from the upper surface thereof, in which the blades are removably positioned, the upper surface of the mov-

able carriage forming a skin-contacting surface during shaving operations, the cutting edges of the blades being positioned just outside such slots and lying on substantially the same plane as said upper surface, one of such blades lying adjacent to the forward and to the rearward edge, respectively, of the carriage, and at least one blade being positioned therebetween, and a guard portion positioned adjacent to and in advance of the forward cutting edge.

4. A mechanical shaving device comprising a blade carriage, a plurality of blades carried thereby in spaced relation to each other, a support for the blade carriage and means for imparting reciprocating motion to the blade carriage at substantially right angles to the cutting edges of the blades, said carriage having a plurality of spaced, diagonally disposed recesses forming seats for the blades, a retaining plate engaging the upper surface of each blade, the cutting edge of each blade projecting just beyond the plate and lying adjacent to the upper surface of the plate, the upper surfaces of the several plates lying on the same plane and contacting the skin during the shaving operation, guide means carried by the carriage support for permitting said reciprocating movement of the carriage, the carriage having an aperture therein, an eccentric driving cam positioned within the aperture and a rotatable shaft supporting the cam, and means comprising a prime mover for rotating the shaft.

5. A mechanical shaving device comprising a blade carriage, a plurality of blades carried thereby in spaced relation to each other, a support for the blade carriage and means for imparting reciprocating motion to the blade carriage at substantially right angles to the cutting edges of the blades, said carriage being substantially rectangular in shape and being formed with a guard portion adjacent to the forward blade, the carriage having a plurality of spaced, diagonally disposed recesses forming seats for the blades, a retaining plate contacting the upper surface of each blade, the cutting edge of each blade projecting just beyond the plate and lying on substantially the same plane as the upper surface of the plate, the upper surfaces of the plates lying on the same plane and contacting the skin during the shaving operation, guide members carried by the carriage support along opposed edges perpendicular to the blade cutting edges to permit said reciprocating movement of the carriage, said guide members being formed with horizontal, inwardly turned extensions engaging the opposed marginal edges of the upper surface of the carriage.

6. A mechanical shaving device comprising a blade carriage, a plurality of blades carried thereby in spaced relation to each other, a flat support for the carriage and including guide means disposed at opposite ends of the support engaging the end walls and the opposed marginal edges of the upper surface of the carriage, and permitting reciprocating movement thereof at substantially right angles to the cutting edges of the blades, and means including a prime mover for imparting such reciprocating movement to the carriage, said carriage being formed with a substantially flat upper surface and having a plurality of diagonally disposed, transverse slots for receiving the blades, means for securing the blades within such slots, the cutting edges of the blades being positioned just outside the slots and lying on substantially the same plane as, but not below, said upper surface, the upper surface of said movable blade carriage forming a skin-contacting surface during the operation of shaving.

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