

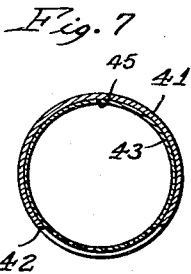
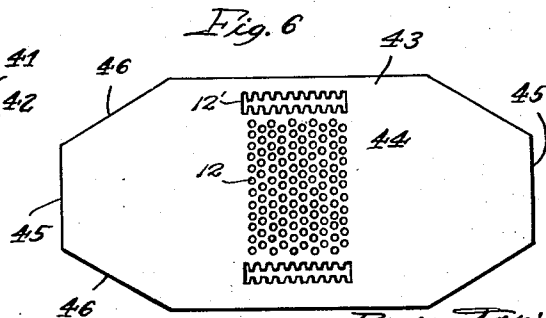
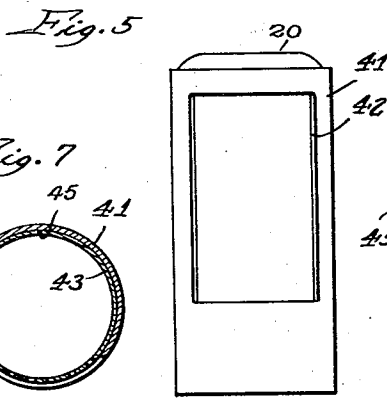
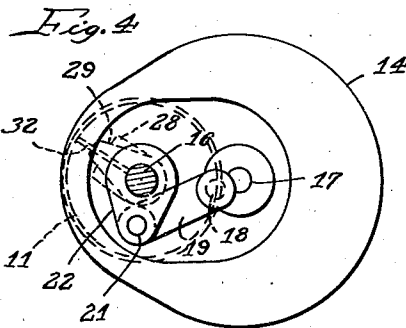
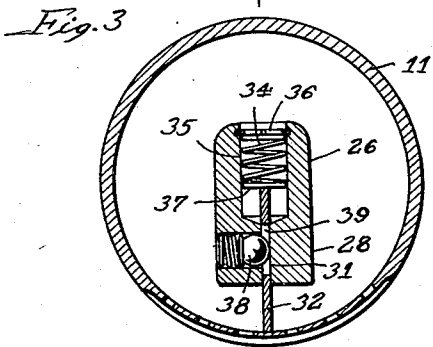
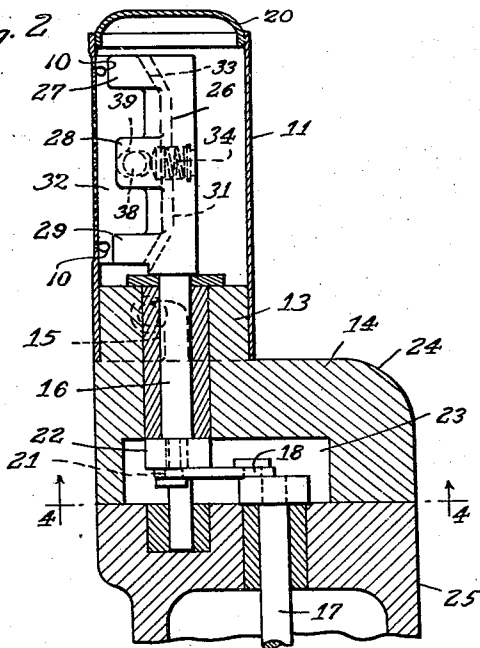
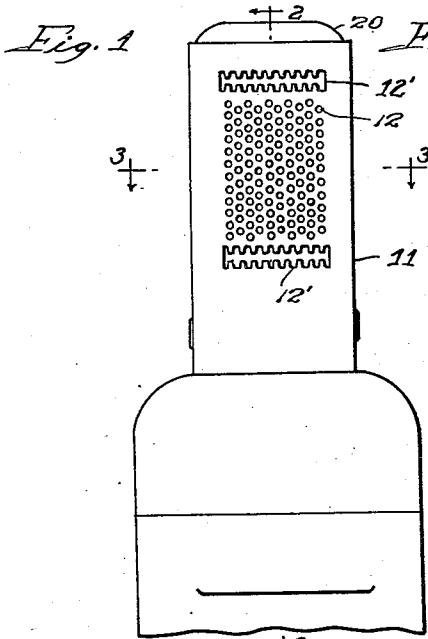
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I. JEPSON

2,282,725

SHAVING IMPLEMENT

Filed May 21, 1938



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UNITED STATES PATENT OFFICE

2,282,725

SHAVING IMPLEMENT

Ivar Jepson, Chicago, Ill., assignor to Chicago Flexible Shaft Company, Chicago, Ill., a corporation of Illinois

Application May 21, 1938, Serial No. 209,234

6 Claims. (Cl. 30-43)

This invention relates to shaving implements of the type known as dry shavers and has for its object certain improvements on the invention in the patent to John Bruecker, No. 2,081,694.

One of the objects of my invention is to provide in a shaving implement of the Bruecker type, means for positively maintaining the movable cutter blade perpendicular to the shearing edges of the stationary arc blade or comb during the entire movement of the cutter blade past the stationary shearing edges, whereby to effect a more efficient cutting or shearing relation between the shearing edges at both sides of the movable blade and the shearing edges at the inner side of the stationary arc blade, and whereby said shearing edges at both sides of the movable cutter blade are kept sharp by the self-sharpening action of the movable blade in this new relationship.

In a shaving implement of the character described the comb may be removed for inspection or cleaning, leaving the cutter blade exposed. Handling of the electric shaver in this condition is apt to cause the cutter blade to be displaced from operative position on its holder and there is also danger of the blade being thrown clear of the holder if the electric motor is started. The present invention aims to provide a practical means of preventing displacement or dislodgement of the cutter blade from its holder at all times except when it is desired to remove the blade. Thus, the blade may be assembled on the holder and handled at the factory and in use without danger of displacing or losing the blade under any circumstances.

Another object of my invention is to provide in a shaver of the character described, an improved comb construction with the view to simplifying the mounting of the comb and to promoting economy in the cost of manufacture.

Another object is to provide improved means for holding and oscillating the cutter blade.

Other objects and attendant advantages will be appreciated by those skilled in this art as the invention becomes better understood by reference to the following description when considered in connection with the accompanying drawing, in which—

Figure 1 is a face view of a shaving implement embodying my invention, part of the handle structure being broken away;

Fig. 2 is a longitudinal section taken substantially on the section line 2-2 of Fig. 1;

Fig. 3 is an enlarged cross-section through the

shaving head taken substantially on the section line 3-3 of Fig. 1;

Fig. 4 is a section taken substantially on the section line 4-4 of Fig. 2;

Fig. 5 is a face view of a comb supporting body different from that shown in Fig. 1, embodying one of the features of my invention;

Fig. 6 is a face view of the comb per se used with the comb supporting body shown in Fig. 5; and

Fig. 7 is a cross-section through the comb and its supporting body of the kind shown in Figs. 5 and 6.

My invention may be applied to shaving implements other than those embodying the Bruecker invention above mentioned. However, for purpose of illustrating the present invention I have shown in the drawing a shaving implement of the Bruecker type. Briefly, this includes a tubular comb body designated generally by 11 having hair-receiving openings 12 and supported on a cylindrical extension 13 of the housing structure 14 and retained thereon through means of one or more bayonet slot connections 15. A cutter operating shaft 16 journaled in the housing 14 concentric with the comb 11 is parallel with and offset from a power driven shaft 17 which may be the armature shaft of an electric motor contained within the handle part of the housing structure. The present invention provides an improved driving connection between the shafts 16 and 17 whereby the former shaft is oscillated by continuous rotation of the latter shaft. This driving connection consists of an eccentric pin 18 on the outer end of the armature shaft connected to one end of a link 19, the opposite end of which is connected at 21 to a lever arm 22 fixed to the inner end of the shaft 16, this driving connection being disposed within the enclosure 23 formed by the housing part 24 and the outer end of the handle or motor part 25 of the housing structure, the two parts being suitably connected together as by means of screws not shown. This driving connection serves to oscillate the shaft 16 and the cutter holder and its blade, which will be presently described, back and forth to rapidly move the blade across the inner side of the perforated portion of the comb in a shearing action. The particular form and arrangement of the perforations or hair-receiving openings 12 and 12' in the comb are not essential to the present invention. The small openings 12 in the central area are adapted for close shaving and the elongated openings 12' at opposite ends of said central area

each with opposed rows of small teeth are for clipping loose hairs. Where the latter type of openings are used the cutting edge of the blade 32 is slotted or cut away at the portions 10 to provide relief across the open space between the extreme ends of the small teeth so that if the skin should enter this open space and project beneath the inner face of the comb it would not be cut or irritated by the blade. Hair-receiving openings of this type in the stationary comb or blade structure are claimed in the patent to John Bruecker No. 2,234,891. In the present case I have shown openings of this type in the thin tubular body member 11 in the form shown in Figs. 1 to 4, inclusive, and in a thin strip or sheet 43 described below in reference to the form shown in Figs. 5, 6 and 7. In both of these forms an end cap 20 is applied to the otherwise open outer end of the tubular bodies 11 and 41, respectively. It will be manifest, however, that insofar as the function of the cutting elements is concerned the stationary comb member or blade structure as herein termed, may be of any suitable or preferred construction without limitation to the use of an end cap such as designated by 20. In the present embodiment of my invention the blade holder designated generally by 26 is integral with its supporting shaft 16 and has a plurality of radially projecting, longitudinally aligned blade guides 27, 28 and 29. These guides are slotted in a common plane, as at 31, to receive a flat cutter blade 32. In the form here shown, the blade slot 31 extends into the holder proper substantially from end to end thereof as shown in dotted lines in Fig. 2 to accommodate the shape of the blade, the inner edge of which is shown by dotted lines 33 in Fig. 2. By reason of this mounting the blade is loose and free to have bodily movement under centrifugal force and is pressed outwardly by such force against the inner side of the comb in shearing engagement with the inner edges of the perforations therein when the holder is rapidly oscillated. The blade is further pressed outwardly by means of a suitable spring 34 such as a coiled compression spring confined in a drilled opening 35 in the blade holder between retainers 36 and 37, the latter of which bears against the inner end of the blade as shown clearly in Fig. 3. The retainer 36 may be in the form of a ring or wire located in a groove in the holder or retained therein by peening the edge of the holder. In order to retain the blade in operative relation with its holder under all conditions except when it is desired to remove the blade from the holder I have provided a spring pressed retaining ball 38 confined in the holder medially between the ends thereof, as shown in Figs. 2 and 3, and disposed in an opening 39 in the blade. The opening 39 is of sufficient size to permit a limited amount of radial movement of the blade with respect to its holder so that the blade will be free to seat against the comb under all operating conditions. Thus, when the comb is removed from the shaver, or before assembly thereon, the retaining means 38 prevents displacement or dislodgement of the blade from the holder either during handling of the implement or in the event of operating the motor. It will be evident that the retaining means is part of the holder assembly and that the blade may be removed from its operative position or replaced merely by pulling the blade outwardly to remove it from the slot 31 or pressing it inwardly into said slot (as the case may be) with pressure sufficient to displace

the spring pressed ball. The ball retainer will not, however, be displaced by the force of the spring 34 or the centrifugal force, or both, to the extent of disconnection of the cutter from the holder if the motor should be operated with the comb removed from the implement. This feature of my invention is particularly advantageous and may be generally applied in any shaving implement embodying the principles of the Bruecker invention, or any other shaving implement to which my invention is applicable.

One of the advantages of my invention is the novel mounting of the movable cutter blade 32 on the oscillating holder 26 whereby the movable cutter blade is positively maintained perpendicular to the shearing edges of the stationary arc blade or comb 11 during the entire movement of the cutter blade past said stationary blade edges. It will be observed from the drawing that the slot 31 which has parallel side walls is in a plane in fixed relation to the shaft 16 of the blade holder and that this plane extends longitudinally of the axis of said shaft and is radial with respect to and intersects said axis. It will also be observed that the flat cutter blade 32 has a sliding fit in the holder and is confined at both sides by the side walls of the radial slot 31 in the holder. Thus, while the cutter blade is free to slide in the plane of said slot it is also positively confined by the side walls of the slot so as to be maintained at all times in perpendicular relation to the shearing edges formed by the openings 12 in the stationary arc blade or comb 11. The shearing edges at the opposite sides of the movable cutter are, therefore, maintained at all times in closely abutting relation with the inner side of the stationary plate or comb and consequently in improved cutting or shearing relation with the stationary shearing edges. Also, by reason of this improved relationship between the movable cutter blade and the arc blade an improved self-sharpening action is obtained.

In Figs. 5, 6 and 7, I have shown another feature of my invention characterized by a comb in the form of a normally flat strip of extremely thin sheet steel perforated to provide the desired hair-receiving openings and confined internally within a comb supporting body preferably of tubular form. In illustrating this feature of my invention I have shown a tubular body 41 having an opening 42 defining the shaving area. This tubular body may be of comparatively thin material such as drawn tubing. The comb proper shown in Fig. 6 is a normally flat strip or sheet of extremely thin spring steel designated generally by 43 which is perforated over a central area to provide the desired hair-receiving openings. This strip is of preferably about .003" thickness although it may in actual practice be of less thickness, depending on the diameter of the perforations 44. In the preferred form of my invention the comb 43 is of such length that it may be curled or coiled into tubular form for insertion into the tubular support 41 through an open end thereof and when so inserted it will conform to the cylindrical internal wall of the holder 41 with the opposite ends 45 in abutting relation as shown in Fig. 7. In this form of the invention I prefer to reduce the end portions of the comb at the sides 46 so as to reduce the internal stress of the comb at its end portions and thereby permit such end portions to seat throughout their length against the internal wall of the tubular comb holder. In this form of my

invention the inherent expansive force of the comb exerts sufficient pressure against the internal wall of the tubular holder 41 to retain the comb in the desired operative position and with its perforated portion in a true arcuate shape.

The invention is not to be understood as restricted to details set forth, since these may be modified within the scope of the appended claims, without departing from the spirit and scope of the invention.

I claim:

1. In a shaving implement, a removable comb, a cutter, a holder for the cutter, means for rapidly moving the holder to operate the cutter in coaction with the comb, means whereby the cutter is free to move upon and with respect to the holder in a direction to urge its cutting edge into intimate shearing engagement with the comb when the holder is operated and whereby when the holder is operated centrifugal force is imposed on the cutter in said direction sufficient to disconnect the cutter from the holder in the event of removal of the comb, and means carried on the holder in cooperative relation with the cutter arranged so as not to interfere with the normal functioning of the cutter and to positively prevent disconnection of the cutter from the holder in the event the latter is operated with the comb removed, the second mentioned means having a part normally preventing said disconnection and operable manually by the user to permit removal of the cutter from the holder without disturbing the operative relation of the holder with respect to the shaving implement.

2. A shaving implement as set forth in claim 1, in which the second mentioned means comprises a spring-pressed ball mounted in the holder and the cutter has an opening to receive a projected portion of the ball, the opening being shaped to allow the first mentioned movement of the cutter on the holder, and a wall of said opening serving to prevent disconnection of the cutter from the holder when the comb is removed.

3. In a shaving implement, a body having an internal wall of cylindrical-like form and an opening therein defining a shaving area, and a comb of normally flat thin sheet steel perforated medially between its ends to provide hair-receiving openings in an area conforming substantially with the shaving area opening, the comb sheet being disposed within the body with its perforated area in registration with said shaving area opening and having such inherent resiliency as to press outwardly against the internal cylindrical-like wall with its opposite end portions extending substantially beyond the shaving area, a substantial length of each end portion of the sheet being gradually reduced in width toward its outer end to provide a diminishing degree of reduction in internal stress in such end portion to accurately conform the comb to the internal shape of the body.

4. In a machine of the character described, a stationary blade structure including an arcuate thin body portion, the outer surface of which is adapted to be pressed against the skin and having a plurality of hair-receiving openings therein defining a plurality of stationary shearing edges, a movable blade comprising a plate one edge of which defines a shearing edge extending longitudinally with respect to said body portion, a shaft, means mounting said shaft for oscillation about an axis parallel to the longitudinal axis of said body portion, means mounting said movable blade plate upon said shaft for sliding movement in a plane in fixed relation to said shaft extending longitudinally of said axis and intersecting said axis whereby the shearing edge of said blade will be maintained in closely abutting relation with the under surface of said body portion and substantially perpendicular to the shearing edges of said stationary blade structure.

5. In a machine of the character described, a stationary blade structure including a thin body portion, the outer surface of which is adapted to be pressed against the skin and having a plurality of hair-receiving openings therein defining a plurality of stationary shearing edges, a movable blade comprising a plate, one edge of which defines a shearing edge abutting the under surface of the body portion, means for moving the blade relative to said body portion to move the shearing edge thereof through a path parallel with the under surface of said body portion, and means mounting said movable blade upon said moving means solely for movement relative thereto in a plane in fixed relation to said shaft perpendicular to the under surface of said body portion whereby the shearing edge of said movable blade will be maintained in closely abutting relation with the under surface of said body portion to render said movable and stationary blades self-sharpening.

6. In a machine of the character described, a stationary blade structure including an arcuate thin body portion, the outer surface of which is adapted to be pressed against the skin and having a plurality of hair-receiving openings therein defining a plurality of stationary shearing edges, a movable blade comprising a plate one edge of which defines a shearing edge extending longitudinally with respect to said body portion, a shaft, means mounting said shaft for movement about an axis parallel to the longitudinal axis of said body portion, means mounting said movable blade plate upon said shaft for sliding movement in a plane in fixed relation to said shaft extending longitudinally of said axis and intersecting said axis whereby the shearing edge of said blade will be maintained in closely abutting relation with the under surface of said body portion and substantially perpendicular to the shearing edges of said stationary blade structure.

IVAR JEPSON.