Dec. 22, 1942. E. H. LINDHOLM 2,306,172

SHAVING IMPLEMENT

Filed Oct. 29, 1940 2 Sheets-Sheet 1

Fig. 1

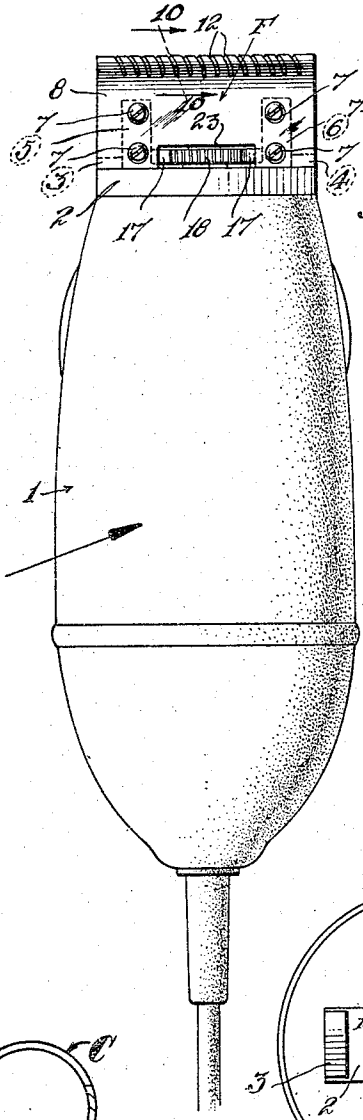


Fig. 3

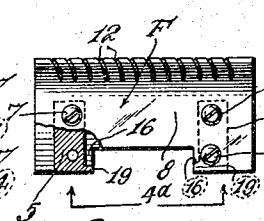
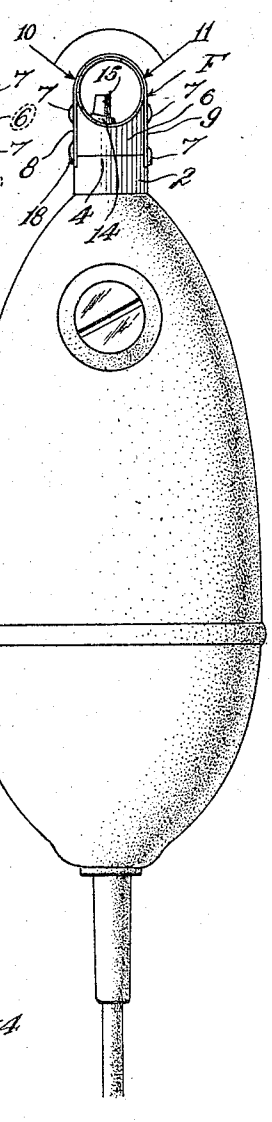


Fig. 2



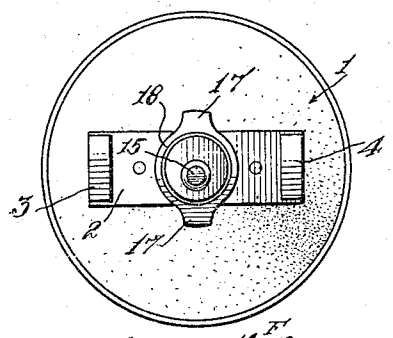


Fig. 4



Fig. 10

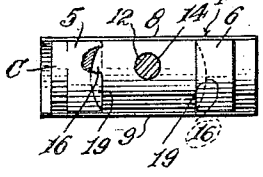


Fig. 4a

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SHAVING IMPLEMENT

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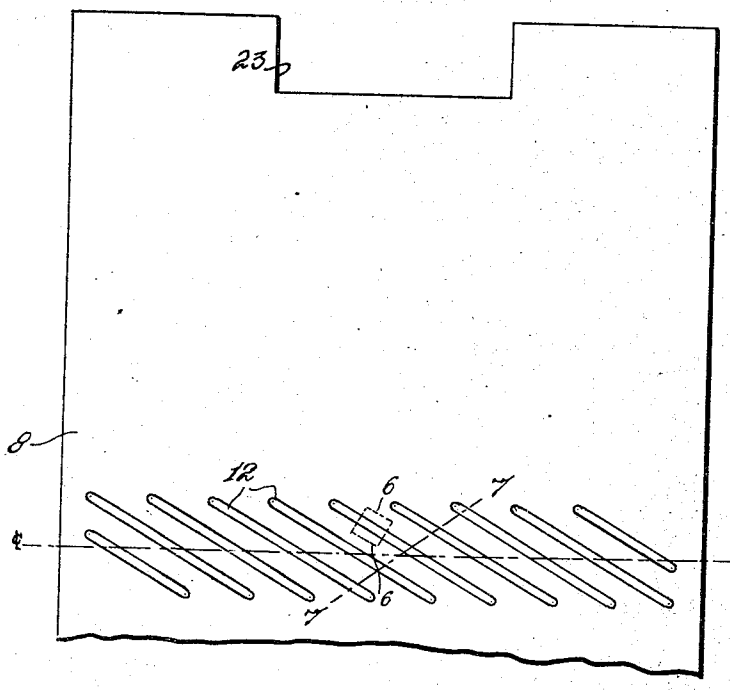


Fig. 5

Fig. 6

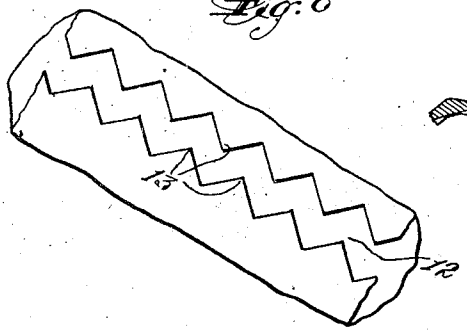


Fig. 7

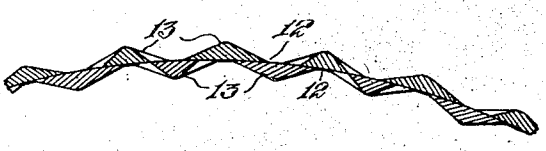
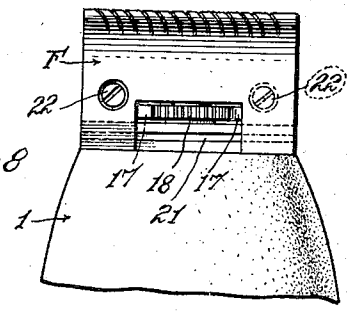


Fig. 8



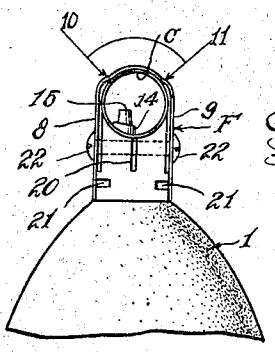


Fig. 9

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SHAVING IMPLEMENT

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Application October 29, 1940, Serial No. 363,250

18 Claims. (Cl. 30—43)

This invention relates to a shaving implement composed of a small electric motor housed within a casing and adapted to be operated by the usual lighting circuit, either A. C. or D. C., and a shaving head adapted to be quickly attached and detached by a locking device from a mounting plate carried on one end of the motor.

It is one of the objects of my invention to provide a shaving implement in which the part which I term the flesh-engaging member has a circularly formed portion with closely spaced diagonally positioned slots therein, the material along the edges of these slots having teeth formed therein so that the hairs on the face of the user may be more readily picked up and brought into position with a circularly formed cutter positioned within the flesh-engaging member. I have found, by experimentation, that a circular or arcuately formed flesh-engaging member, with diagonal slots, gives far better results than any structure having slots arranged at right angles to the axis of the cutter. Furthermore, I have found that the efficiency of the shaving implement is greatly improved by providing teeth along the edges of the slots, especially on the flesh-engaging member, although the cutter may have similarly formed teeth on the edges of the diagonal slots in the cutter, which latter slots are preferably arranged in number and position according to the slots in the flesh-engaging member.

One great advantage of my improved construction is that with the diagonally arranged slots more hairs are brought into cutting position than with the ordinary type of dry shaver. Furthermore, if a hair is missed by one slot, it will be picked up by another slot on the same stroke of the razor. A further advantage is that teeth bordering on the edge of the slots assist in picking up the hairs if they are lying down and bring these into better position for being acted on by the internally positioned cutter.

A still further advantage is obtained by the ease of assembling and disassembling, for cleaning purposes, the shaving head from its mounting on the motor.

Another object of my invention is to provide a construction in which the flesh-engaging member and its cooperating cutter are made from sheet material of suitable chemical composition. I have secured excellent results by making the two cutting members out of thin sheet steel of approximately .015" thick and having a carbon content of .6 to .8. It is to be understood that the steel may be of the stainless or rustproof type, or plated with rustproof material such as chromium, after being made, the important point being that the material is preferably of a type which can be tempered. By making the two cutting members of sheet or flat tool steel stock, a further advantage is obtained by being able to make the shaving head much cheaper than by the usual method of using castings or sawing out the slots from solid material.

The various steps in the manufacture of the two principal parts of the shaving head need not be gone into as they form no immediate part of my invention which is depicted in the attached drawings, wherein:

Figure 1 is a somewhat enlarged side elevational view of one form of a completely assembled shaving implement.

Figure 2 is a view of Figure 1, taken at right angles thereto.

Figure 3 is a view of the shaving head shown in Figure 1, removed, with a portion broken away to show the detail construction.

Figure 4 is a plan view of Figure 1, with the shaving head removed.

Figure 4a is a bottom view of the shaving head of Figure 3 as removed from Figure 4.

Figure 5 is a partial plan view on a much enlarged scale of the sheet material from which the flesh-engaging member is made, the enlargement being on approximately a four-to-one scale.

Figure 6 is an enlarged plan view of a portion in the vicinity of one of the slots as bounded by the dotted line marked 6—6 of Figure 5.

Figure 7 is an enlarged view approximately on the line 7—7 of Figure 5, but showing, in addition, the position of the cutter when it is equipped with teeth along the slot edges.

Figure 8 is a view similar to the upper part of Figure 1, but showing a modified construction of head.

Figure 9 is an end view of Figure 8.

Figure 10 is an enlarged sectional view through the central part of the cutter substantially on line 10—10 of Fig. 1.

In the different views, an electric motor structure is shown having a casing 1 with a mounting plate 2 fastened to the end frame of the casing. The plate 2 carries positioning lugs 3 and 4 which are adapted to be engaged by anchor members 5 and 6 which are fastened by screws 7 to the opposite arms 8 and 9 of the flesh-engaging member F which is generally U-shaped in section, although elongated in form, as shown by Figures 1 and 3. The arms of the U terminate in a round or cylindrical portion extending approximately from the point 10 to the point 11. This cylindri-

cal portion between the lines 10 and 11 is provided with a plurality of slots 12 which are diagonally arranged in substantially parallel relation. These slots are indicated in Figure 5 which shows one arm 8 of the flesh-engaging member, the other arm 9 being removed in order to get the view on the drawing.

Preferably the material along the edge of each slot is provided with teeth 13 which for the purpose of clarity are not shown in Figure 5, but are shown in Fig. 6, as they are preferably made very fine and close together so that they would be rather difficult to properly show in Fig. 5; for example, in an arcuate distance of approximately 3/8" there are from twenty to twenty-five teeth on the model which I have found to be very satisfactory and from which the drawings were made, the diameter of the cylindrical part 10 to 11 being approximately 3/8".

A view of the cutter C is shown in Figure 10. The cutter is made of sheet stock, the same as the flesh-engaging member F, and while it may be made of seamless tubing, it can be rolled up and spot- or seam-welded along the seam. I prefer to punch or turn inwardly some of the metal to form a suitable bearing surface 14 for the cam 15 which is mounted eccentrically on the end of the motor shaft so that as the motor turns the cam 15, operating in the hole of the projection or boss 14, will not only give the cutter C a rotary motion but also a longitudinal motion with respect to the member F, enough to cause a proper shearing action between the slots in the cutter C and the slots 12 in the flesh-engaging member F.

It will be noted that in the form of shaving head shown in Figures 1, 2 and 3, the anchor members 5 and 6 are formed at their inner ends with a true arc, corresponding to the arc of the cutter C, so that when the cutter C is pushed into place within the member F, it will be held closely against the cylindrical portion 10—11 of the member F. After the cutter C has been inserted within the member F, so that the hole in the boss 14 is in alignment with the cam 15, the shaving head is placed on the mounting plate 2 and the anchor members 5 and 6 are positioned within and against the positioning lugs 3 and 4. The anchor members 5 and 6 are milled out to provide recesses, one of which, 16, is more clearly shown in Figure 4a, to receive the ends 17 of a locking device 18 which is rotatably mounted on the mounting plate 2. The exterior surfaces of the member 18 are preferably knurled so that the same may be readily turned to force the ends 17 into locking position within the recesses 16, whereby the end portions 17 will overlap the projecting ledges 19, thereby locking the shaving head to the motor mounting plate. The arms 8 and 9 are notched out at 23 to accommodate the locking device 18. It will be apparent that this locking arrangement can be very quickly operated to release the shaving head for cleaning purposes and for replacing it after the cleaning operation.

In Figures 8 and 9 the construction of the cutter C is the same as heretofore described. However, the member F is somewhat differently constructed in that the arms 8 and 9 are spaced a short distance away from the cutter C across its horizontal diameter, but from the similar points 10—11 the arcuate surface of the member F is the same as the cutter. Furthermore, the anchor members 5 and 6 are slotted at 20 and 21 so that the ends divided by the slot 20 may be drawn toward each other by the screws 22 disposed, one on each side of the member F and at opposite ends, thereby pushing the cutter C upwardly against the arcuate or cylindrical seat in the member F, thereby providing an adjustment to take up their wear between the members F and C. The clearance provided by the slight outward bulge of the arms 8 and 9 at the points 10—11 in this form of construction, allows this adjustment to be made.

While I have indicated in Figure 7 that the cutter C may have teeth along the edges of its slots, this is not absolutely necessary as I have secured excellent results by using a cutter with plain, diagonally arranged slots, it being understood that approximately the last operation on the cutter C and member F is the grinding operation, which will leave each with sharp cutting edges.

Other variations than those described may be made in the details of the construction, without departing from the spirit of my invention or the scope of the appended claims. For example, I may use a reduction gear between the motor shaft and the cam 15 so as to reduce the speed of movement of the cutter C. One model which I have made and successfully operated has such a gear reduction therein.

What I claim is:

1. A shaving implement comprising; a power device, a flesh-engaging member U-shaped in cross-section and having a cylindrical base portion and anchor members fastened between the arms of the U-sectioned member at the opposite ends thereof, said cylindrical portion having a plurality of spaced slots therein and a cylindrical cutter fitting between said anchor members and the cylindrical part of the flesh-engaging member, the cutter having spaced slots therein to cooperate with the slots in the flesh-engaging member, the cutter also having a hole in its wall intermediate its ends and opposite to said slots, the hole adapted to receive an eccentrically mounted power-driven cam, and means for holding the flesh-engaging member to the power device.

2. A shaving implement comprising; a power device, a flesh-engaging member U-shaped in cross-section and having a cylindrical base portion and anchor members fastened between the arms of the U-sectioned member at the opposite ends thereof, said cylindrical portion having a plurality of spaced slots therein, the portions of material on opposite sides of the slots in at least the flesh-engaging member having teeth formed therein, and a cylindrical cutter fitting between said anchor members and the cylindrical part of the flesh-engaging member, the cutter having spaced slots therein to cooperate with the slots in the flesh-engaging member, the cutter also having a hole in its wall intermediate its ends and opposite to said slots, the hole adapted to receive an eccentrically mounted power-driven cam, and means for holding the flesh-engaging member to the power device.

3. A shaving implement comprising; a power device, a flesh-engaging member U-shaped in cross-section and having a cylindrical base portion and anchor members fastened between the arms of the U-sectioned member at the opposite ends thereof, said cylindrical portion having a plurality of diagonally spaced parallel slots therein and a cylindrical cutter fitting between said anchor members and cylindrical part of the flesh-engaging member, the cutter having a plurality of diagonally spaced parallel slots to cooperate with the slots in the flesh-engaging member, the cutter also having a hole in its wall intermediate its ends and opposite to said slots, the hole

adapted to receive an eccentrically mounted power-driven cam, and means for holding the flesh-engaging member to the power device.

4. A shaving implement including a motor structure including a casing having a mounting plate thereon and an eccentrically mounted cam operated by the motor shaft, a locking member carried on the plate, a shaving head fastened to the mounting plate by said locking member, said shaving head comprising a flesh-engaging member consisting of a piece of sheet metal that will take a temper, a plurality of diagonally arranged, closely spaced slots formed in said piece at its central portion, the piece being U-shaped in section with the slots at the base which forms a cylindrical portion, anchor members fastened at opposite ends of and between the arms of the U, the anchor members cooperating with said locking member to fasten the shaving head to the mounting plate, and a cylindrical cutter carried by and between the anchor members and the cylindrical part of said flesh-engaging member, the cutter having diagonally arranged slots corresponding to those in the flesh-engaging member, and a hole in the wall of the cutter to receive said cam.

5. A shaving implement including a motor structure including a casing having a mounting plate thereon and an eccentrically mounted cam operated by the motor shaft, a locking member carried on the plate, a shaving head fastened to the mounting plate by said locking member, said shaving head comprising a flesh-engaging member consisting of a piece of sheet metal that will take a temper, a plurality of diagonally arranged, closely spaced slots formed in said piece at its central portion, the piece being U-shaped in section with the slots at the base which forms a cylindrical portion, anchor members fastened at opposite ends of and between the arms of the U, the anchor members cooperating with said locking member to fasten the shaving head to the mounting plate, and a cylindrical cutter formed from a piece of sheet metal that will take a temper, the cutter being carried within the cylindrical part of the flesh-engaging member, the cutter having diagonally arranged slots corresponding to those in the flesh-engaging member, and a hole in the wall of the cutter to receive said cam.

6. A shaving head for a shaving implement comprising a pair of telescopically fitting shearing members made of sheet metal which will take a temper, the inner member being formed into a cylinder having a hole in the wall to receive a power-driven cam for moving the cylinder in two directions, the outer member having a cylindrical portion to receive the inner member, and means for holding the inner member closely against the cylindrical portion of the outer member, both members having diagonally arranged, closely spaced parallel slots positioned in cooperative relation as the inner member is moved.

7. A shaving head as set forth in claim 6, further defined in that the material along the edges of the slots in at least the outer shearing member is provided with teeth for gathering the hairs into position to be cut by the shearing action of the two shearing members.

8. A shaving head for a shaving implement comprising a pair of telescopically fitting shearing members, the inner member being in the form of a cylinder having a hole in the wall to receive a power-driven cam for moving the cylinder longitudinally and rotatably, the outer member having a cylindrical portion to receive the inner member, and means for holding the inner member closely against the cylindrical portion of the outer member, both members having diagonally arranged, closely spaced parallel slots positioned in cooperative relation as the inner member is moved.

9. A shaving head as set forth in claim 8, further defined in that the material along the edges of the slots in at least the outer shearing member is provided with teeth for gathering the hairs into position to be cut by the shearing action of the two shearing members.

10. A shaving head as set forth in claim 8, further defined in that the material along the edges of the slots in at least the outer shearing member is provided with teeth for gathering the hairs into position to be cut by the shearing action of the two shearing members, and further defined in that means are provided for adjusting parts of the outer member to take up for wear between the two parts.

11. A shaving implement including a shaving head comprising a member having a cylindrical portion for engaging the skin while shaving, said portion having diagonally arranged slots with teeth in the material forming the slot edges, and a cylindrical cutter positioned within the skin-engaging member and having slots similarly arranged as in said member to cooperate with the slots therein, and means for imparting longitudinal and rotary motion to the cutter.

12. In combination with an electric motor structure having a casing carrying a mounting plate and a locking device thereon and a cam on an extension of the motor shaft, of a shaving head having two telescopically arranged members, the outer member having a cylindrical portion with slots therein, and relatively wide arms extending from the cylindrical portion and having parts adapted to be engaged by said locking device to hold the shaving head on the mounting plate, the inner one of said members being in the form of a cylinder having means on its wall to be engaged by said shaft cam to move it simultaneously in two directions, the cylinder also having slots in its wall opposite to the said hole, the slots cooperating with the slots in the outer member to cut the hair.

13. A shaving implement arrangement as set forth in claim 12, further characterized in that the slots on both telescopic members are arranged diagonally, and the slot edges in at least the outer member have teeth formed therein.

14. A shaving implement including a shaving head comprising a member having a cylindrical portion for engaging the skin while shaving, said portion having slots therein with teeth in the material forming the slot edges, and a cylindrical cutter positioned within the skin-engaging member and having slots therein to cooperate with the slots in the skin-engaging member, and means for imparting longitudinal and rotary motion to the cutter.

15. A shaving implement including a shaving head comprising a member having a cylindrical portion for engaging the skin while shaving, said portion having slots therein with teeth in the material forming the slot edges, and a cylindrical cutter positioned within the skin-engaging member and having slots therein with teeth along the slot edges similar to those in the skin-engaging member, and means for imparting longitudinal and rotary motion to the cutter.

16. A shaving implement including a shaving

head comprising a member having a cylindrical portion for engaging the skin while shaving, said portion having slots therein with teeth in the material forming the slot edges, and a cylindrical cutter positioned within the skin-engaging member and having slots therein to cooperate with the slots in the skin-engaging member, means for imparting longitudinal and rotary motion to the cutter, and means for adjusting the cooperative position of the cutter and the cylindrical portion of the skin-engaging member.

17. A shaving implement including, an electric motor structure having a casing carrying a mounting plate with guide members thereon, a shaving head having a skin-engaging member and a cutter within said member, the skin-engaging member having a cylindrical portion with toothed slots therein and arms extending from said cylindrical portion, an anchor piece for each arm, said anchor piece having cylindrical seats and also having cut-out portions to form ledges, a locking member carried by said mounting plate having fingers to engage said ledges to lock the skin-engaging member to the mounting plate, and a cylindrical cutter positioned on said circular seats and in engagement with cylindrical portion of the skin-engaging member, and having slots positioned to cooperate with the slots in the skin-engaging member, and means on the cutter cooperative with means operated by the motor shaft for imparting to the cutter both rotary and longitudinal motion.

18. A shaving implement as defined in claim 17, further characterized in that the slots in both the skin-engaging member and the cutter are diagonally arranged and the cutter slots have teeth arranged along their borders.

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