Sept. 10, 1935. R. HEIMERS 2,014,067

SHAVING AND HAIR CUTTING APPARATUS

Filed June 25, 1934

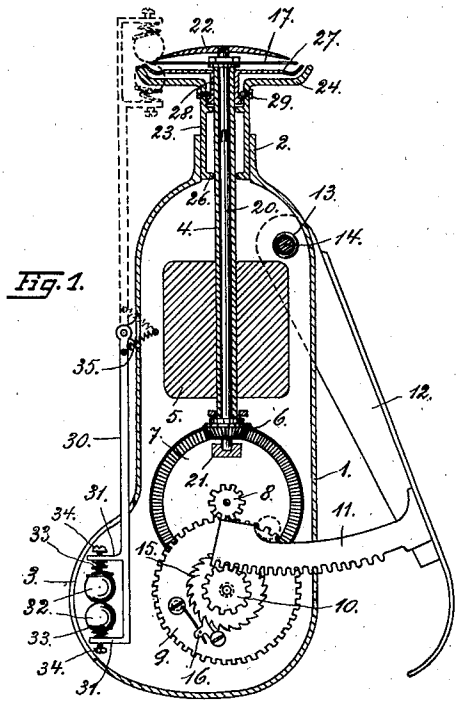


Fig. 1.

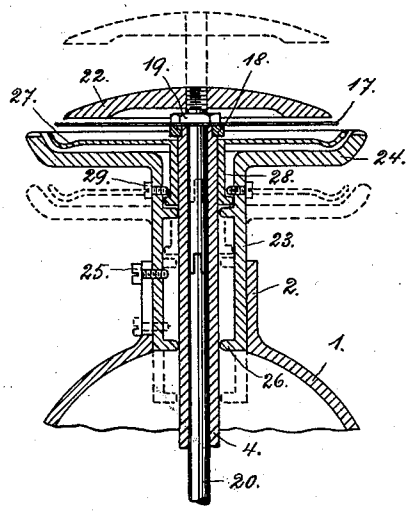


Fig. 2.

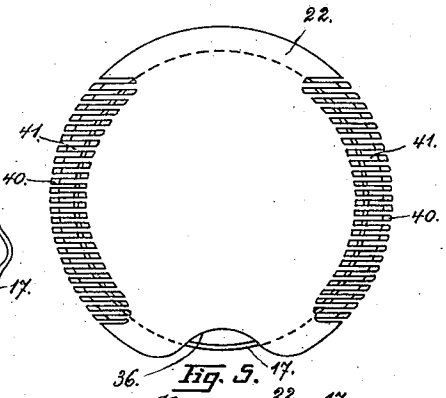


Fig. 5.

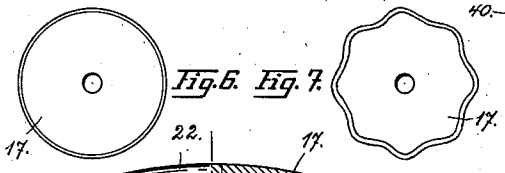


Fig. 6. Fig. 7.

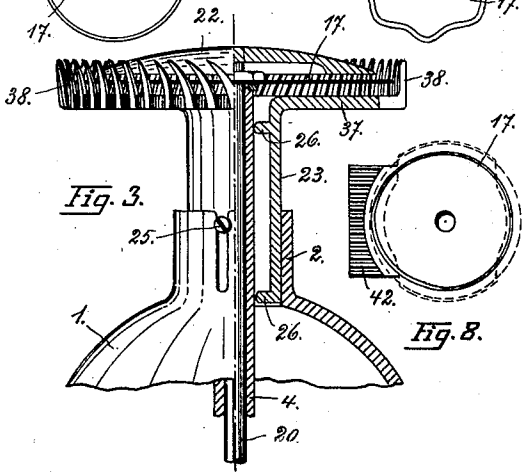


Fig. 3.

Fig. 8.

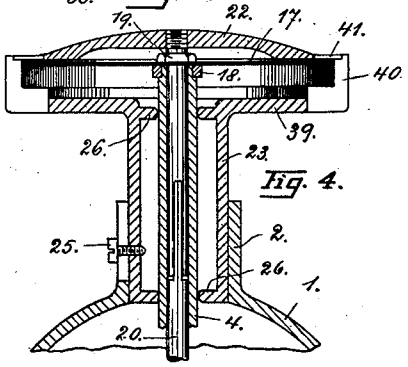


Fig. 4.

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SHAVING AND HAIR-CUTTING APPARATUS

Rudolf Heimers, Mexico, D. F., Mexico

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3 Claims. (Cl. 30—12)

The invention relates to hand- or power-operated shaving and hair-cutting apparatus in which the severing of the hairs in shaving or hair-cutting is effected by a rotary circular blade or cutter operated at high speed, and has for its main object to provide an apparatus which in shaving will remove the hair without danger of cutting the skin and which, by changing or displacing the guard used for shaving, permits the hair to be cut at different easily adjustable lengths.

Another object is to provide a shaving and hair-cutting apparatus which also comprises means incorporated in the same apparatus for honing or sharpening the rotary cutter without removing it from the apparatus, using the rotation of said cutter for effecting the honing or sharpening operation.

Briefly described, my shaving and hair-cutting apparatus makes use of a circular blade or cutter having a sharpened periphery rotated at high speed, whereby the microscopically small projections or teeth existing even in the best honed cutting edges produce the effect of a circular saw cutting the hairs, said cutting effect being greatly increased by the high speed at which the blade revolves and which does not allow any dull part of the periphery to remain in contact with the skin for any length of time. Suitable adjustable guards keep during the shaving operation the surface of the skin smooth and at such a distance and such an angle from the revolving blade that all danger of cutting the skin is eliminated, while permitting the blade to contact with the skin when the guards are firmly pressed against it, producing thereby a close shave. During the hair-cutting operation, other guards interchangeable with the shaving guards, or the same guards in a different respective position to the blade, let the hair enter through slotted portions and permit the hair to be cut at any desired length determined by the distance of the blade from said guards.

In the accompanying drawing:

Figure 1 is a longitudinal cross section through a hand-operated apparatus having shaving guards and a sharpening device.

Figure 2 is a sectional view of the head of the apparatus with displaceable shaving guards.

Figure 3 is a view, partly in cross-section, of the head of an apparatus provided with hair-cutting guards.

Figure 4 is a sectional view of a combined shaving and hair-cutting guard.

Figure 5 is a top view of the guards shown in Figure 4.

Figure 6 is a plan view of a circular cutter or blade.

Figure 7 is another plan view of a circular cutter or blade having an undulating periphery.

Figure 8 is a plan view of a blade having an eccentric cutting edge, with a portion of a guard having straight parallel rills or teeth.

The apparatus shown in Figure 1 comprises a mechanism for rotating the cutting blade by hand-operated means, but it is expressly understood that the rotation of the blade may also be effected by other means, such as an electric motor placed within the housing or handle of the apparatus, a flexible shaft operated by outside means, a spring mechanism or any other power-producing device, and I do not wish to limit myself to the particular construction illustrated in Figure 1.

Referring to this figure, the casing 1 of the apparatus, acting also as a handle, is of a substantially tubular shape, constructed in the form of a tubular shell or cylinder narrowing at its upper extremity to a collar or flange 2 of smaller diameter, and having at its lower extremity an outwardly bulging lateral portion 3 for housing the sharpening device. Within this casing 1 and parallel with its axis is placed a hollow axle or shaft 4 to which is attached a heavy cylindrical metal member 5 acting as a flywheel. To the lower inner extremity of the hollow axle 4 is secured a small conical gear wheel 6 which engages a large conical gear wheel 7. On the axle of this wheel 7 is placed a small gear wheel 8 engaging a large gear wheel 9, the axle of which carries another small gear wheel 10 engaged by a toothed segment 11 attached to a handle 12 pivoted at the upper part of the casing 1. A spring 13 surrounding the pivot 14 tends to push the handle 12 outwardly, into the position shown in Figure 1. As the handle 12 is pressed against the casing 1, the teeth of the segment 11 operate the wheel 10 which, by means of a ratchet wheel 15 engaging a ratchet 16, carries with it the gear wheel 9 and this in turn operates the other wheels 8, 7 and 6 producing a rapid rotation of the shaft 4, which rotation is maintained during a relatively long time by the heavy flywheel 5. As the handle 12 returns to its outstanding position, the ratchet wheel 15 slides over the ratchet 16, without stopping thereby the rotation of the other parts of the mechanism.

To the upper extremity of the hollow shaft 4 is secured a circular blade or cutter 17 by means of a washer 18 placed below and a nut 19 placed above said blade. Within the hollow shaft 4 is located a rod 20 held stationary with its lower

end in a bearing or support 21, so that the hollow shaft rotates around said rod. To the top of said rod is secured a circular cap 22 having a convex upper surface and a concave or recessed lower surface so as to provide a space for the nut 19.

Within the collar 2 of the casing 1 slides a tubular member 23 having at its upper end an outwardly extending dished guard 24 of a diameter greater than the diameter of the circular blade 17. The tube 23 may be adjustably held by a screw 25 in a slot provided in the collar 2, and its inner surface is provided with rings or projections 26 forming bearings for the hollow shaft 4.

A second lower guard 27 having slightly upturned edges is placed between the first lower guard 24 and the blade 17, and is of such a diameter that its edge may cover the periphery of said blade. This guard 27 is secured to a tubular member 28 frictionally held around the hollow shaft 4 so that it turns with this shaft and with the blade. The lower edge of this tubular member 28 is provided with a flange, and set screws 29 pass through the outer tubular member 23 above said flange.

The blade 17 rotating horizontally in a fixed plane, the lower guards 24 and 27 may be adjusted with respect to said blade in such a manner that its edge remains below a straight line running from the edge of the cap 22 to the edges of the lower guards 24 and 27, and any possibility of cutting the skin is therefore eliminated. The rotating edge of the blade 17 will only contact with the skin when the guards are firmly pressed against it, so that a fold of the skin is raised and enters between the cap 22 and the lower guards. The edge of the inner guard 27, rotating at the same speed as the blade, further prevents the latter from cutting into the skin. By holding the blade at a very acute angle and almost parallel with the skin, the cap 22 may even be dispensed with, but this cap acts as a thin bearing surface which prevents the blade from having its rotation retarded or stopped by its contact with the skin. The inner guard may also be omitted, in which case the blade is also preferably held at a very acute angle and almost parallel with the skin, whereby the cap 22 may be made very thin, at least towards its periphery.

Means have been provided for incorporating into the shaving and hair-cutting apparatus a device for sharpening or honing the circular blade, without removing it. These means comprise an arm 30 pivoted with one end outside and about the middle of the casing 1. The opposite end of this arm carries two shorter arms 31 projecting at right angles, and between these two arms are held two balls 32 by means of spiral springs 33 and adjusting screws 34. When not in use, these balls with their supporting arms are located within the bulge 3 of the casing 1, into which they enter through a slot in said bulge, and are held in this position by a spring 35 located beneath the pivot of the arm 30. When the blade 17 is to be sharpened, the cap 22 is pulled out for a certain distance, as shown in Figure 2, said pulling-out being made possible by separating the rod 20 carrying said guard into two parts held together by slotted portions. The lower guards 24 and 27 are pushed towards the casing 1 by loosening the screw 25 and sliding the tubular member 23 into the collar 2, whereby the inner guard 27 is also slid down by the screws 29 engaging the flange on the tubular member 28. This displacement of the cap 22 and the lower guard exposes the blade 17, and the arm 30 is now swung up into the position shown in dotted lines in Figure 1, when the cutting edge of the blade becomes engaged between the two balls 32, any slight difference in the adjustment being corrected by the screws 34. As the blade 17 is made to rotate while pressing into the point of contact between the two balls 32, such pressure being supplied by the spring 35, its cutting edge will be conveniently honed or sharpened according to the material from which the balls 32 are made. This material may be glass or an abrasive material, the cutting edge being only straightened by glass balls, but really honed or sharpened with balls of abrasive material. I wish it to be understood that instead of balls there may also be used abrasive disks, cylinders or other honing or sharpening devices of suitable construction. The removal of the cap and the lower guard also enables the blade to be easily cleaned or replaced, the cap 22 being completely extracted in the latter case.

Figure 5 shows a modified construction for sharpening the circular blade, consisting in recessing superposed parts 36 of the cap and of the lower guard so as to leave exposed a small part of the periphery of the blade to be engaged by the honing or sharpening means 32. This arrangement permits the guards 22 and 24 to remain in their place while sharpening, the rotating inner guard 27 being omitted in this case.

Figure 3 shows the apparatus provided with a guard for hair-cutting. The tubular member 23 carries in this case a disk-shaped plate 37 having along its periphery a plurality of upwardly extending preferably slanting teeth 38 for catching between them the hairs to be cut, while the cap 22 may be of the same shape as described with relation to the corresponding element of Figures 1 and 2. The circular blade 17 cuts the hairs entering between the teeth 38 and being held thereby, while the length at which the hairs are to be cut may be adjusted by sliding the tubular member 23 more or less out of the collar 2 so as to vary the distance between the blade 17 and the inner surfaces of the cap 22 and the lower guard 27. The same apparatus may be used for shaving, by keeping the blade 17 the proper distance below the teeth 38 and the cap 22.

Figure 4 illustrates the head of another combined shaving and hair-cutting apparatus. The tubular member 23 carries a plate 39 having along its rim, on opposite sides, a number of upwardly extending teeth 40. The cap 22 is also provided with an equal number of parallel teeth 41, the extremities of which enter into recesses of the lower teeth 40, forming thereby a cage-like structure with continuous vertical slots on opposing sides, within which cage the blade 17 rotates. The height of the blade or its distance from the upper and lower walls of the cage may be adjusted by sliding the tubular member 23 up and down in the collar 2, if the apparatus is to be used for cutting the hair. For shaving, the blade 17 is made to rotate in close contact with the cap 22, and the slotted portions of said cap are made thin enough to produce a close shave, as the outside of said slotted portions is pressed against the skin, without any danger of cutting it.

In all of the embodiments of the apparatus described, the rotary blade 17 may either be perfectly circular, as shown in Figure 6, or its edge may

be undulated as appears in Figure 7. The blade may either be of equal thickness throughout, or be slightly thicker in the center. The blade may also have an excentric shape in part of its periphery, as shown in Figure 8, especially adapted to be used for hair-cutting, as the hairs will enter more deeply into the toothed guard 37—38 or 39—40 when encountering the smaller radius of the blade, and will then be cut by a shearing motion, without having time to escape, when the larger radius of the blade is brought to bear against them, which effect must be substituted, on using a circular blade, by a more rapid motion or pull of the apparatus along the skin. The same Figure 8 also shows a lower guard 42 with transversal parallel teeth or rills and a staight outward edge to be brought into contact with the skin, which form of guard may be used with any of the formerly described apparatus.

What I claim is:

1. A shaving and hair-cutting apparatus, comprising a tubular handle, a shaft passing through said handle, means for rotating said shaft, a circular blade having a peripheral cutting edge secured to said shaft outside of said handle, an upper stationary cap of a diameter smaller than the diameter of said blade, a lower stationary and adjustable guard of a diameter greater than the diameter of said blade, an inner guard of a diameter larger than the diameter of said blade but smaller than the diameter of said lower guard located between said lower guard and said blade and rotating with said blade, a sharpening device attached to said handle and adapted to be swung into contact with said blade, and means for separating said cap and said inner and lower guards from the blade for letting said sharpening device contact with the edge of said blade.

2. A shaving and hair-cutting apparatus, comprising a handle of substantially tubular form, a hollow shaft located in said handle, means for rotating said shaft, a circular blade having a peripheral cutting edge secured to said shaft, a cap secured to a stationary shaft passing through said rotating hollow shaft, a slidably adjustable lower guard, a sharpening device comprising rotatable sharpening surfaces pivoted to said handle, normally held within said handle but adapted to be swung into contact with said blade, and recesses provided in both said cap and said lower guard for permitting said sharpening surfaces to contact with the edge of said blade.

3. A shaving and hair-cutting apparatus, comprising a tubular handle, a shaft rotating in said handle, a circular blade having a peripheral cutting edge secured to said shaft, a cap having parallel teeth disposed on opposite sides, a lower guard having angular teeth protruding upwardly substantially at right angles and contacting with the teeth of said cap, forming thereby continuous substantially perpendicular slots around part of the periphery of said blade, means for adjustably spacing said blade from the teeth of said cap, a recess in both said cap and said lower guard at a point not provided with teeth, and a sharpening device adapted to enter into said recess and contact with the cutting edge of said blade.

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