

UNITED STATES PATENT OFFICE

2,301,552

OSCILLATING SAFETY RAZOR

George E. La Cell, Santa Rosa, Calif.

Application May 29, 1939, Serial No. 276,361

4 Claims. (Cl. 30-45)

My invention relates to improvements in an oscillating safety razor, and it consists of the combinations, constructions and arrangements hereinafter described and claimed.

An object of my invention is to provide an oscillating safety razor in which a safety razor assembly is directly connected to a motor casing in such a manner that the rotation of the motor shaft will cause the safety razor head and blade to oscillate as a unit and with respect to the casing. It is possible to cause the razor head to oscillate by a vibrator instead of a motor, but a vibrator generally is not powerful enough to operate the device. A motor provides sufficient force to cause the safety razor to continuously oscillate in the direction of the length of the blade during the time the blade actually contacts with the face. The head of the safety razor may be removed to permit the removal of the blade for cleaning purposes or for substituting a new blade. Novel means is provided for quickly attaching the head to the safety razor after the blade has been placed in position.

I provide a water-tight joint between the oscillating razor blade head and the base which is attached to the motor casing. This permits the razor head to be cleaned with water without damaging the working parts. The device is extremely simple in construction and is durable and efficient for the purpose intended. It is possible to use a razor blade for a much longer time than is customary because the blade will cut more effectively when it is oscillated than where the blade is merely moved over the face.

Other objects and advantages will appear in the following specification, and the novel features of the device will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawing forming a part of this application, in which:

Figure 1 is a front elevation of the safety razor head shown operatively applied to a motor casing;

Figure 2 is a vertical section through the device, showing a part of the motor casing;

Figure 3 is a transverse section through the safety razor head assembly;

Figure 4 is an end elevation of the safety razor head assembly;

Figure 5 is a section along the line 5-5 of Figure 2; and

Figure 6 is a top plan view of the reciprocating member.

In carrying out my invention, I make use of a motor casing indicated generally at 1, and of the

standard hand size used for electric dry shavers. An electric cord 2 enters the casing at its bottom and a wheel 3 projects through a slot 4, this wheel being momentarily rotated by hand to start the motor shaft 5 rotating the instant the motor (not shown) is connected to a source of current. In place of the electric dry shaver head, I substitute a novel safety razor head and base assembly.

The base of the safety razor assembly comprises a housing 6 that has a length corresponding to the length of the top of the casing 1 and a width corresponding to the width of the casing. The housing has a bell-shaped top 7 opening into a channel-shaped lower portion 8. The channel-shaped lower portion has its edges 9 designed to rest upon the top edge 10 of the casing 1. The housing is secured in place by end members 11. Each end member has laterally extending ears 12, see Figure 4, that enter recesses 13 in the ends of the channel portion 8. The end pieces extend down along the sides of the casing as shown in Figure 2, and have openings for receiving screws 14, these screws being threaded into nuts 15, mounted in the casing 1. In this way, the device is connected to the casing.

The end pieces 11 are held against outward movement by a sleeve 16 that encircles the channel portion 8 and projects a slight distance below the bottom of the housing 6 as shown in Figure 3. In fact, the sleeve 16 telescopes slightly over the end of the casing 1. The parts are securely held to the casing in this manner and yet they may be quickly removed therefrom, if desired.

Within the housing 6, I mount a reciprocating member 17. This member has a carriage 18 slidably mounted in the channel 8. The carriage carries an upper set of ball-bearings 19. It will be noted from Figure 3 that the upper set of ball-bearings 19 ride on the inner surface of the channel-shaped member 8 and that the lower set of ball-bearings 20 ride in grooves 21 formed in the inner surface of the channel-shaped portion 8. The lower set of ball-bearings are arranged in two pairs and the ball-bearings in each pair are spaced from each other by cylindrical members 22. The lower set of ball-bearings not only act as an anti-friction support for the carriage 18, but they also hold the carriage against movement in a direction parallel to the motor shaft axis.

The end pieces 11 carry cylindrical projections 11a that extend into the cylindrical passageway formed by the grooves 21 in the channel-shaped member 8 and in the grooves 23 in the carriage. The projections or pins 11a hold the carriage

against transverse movement while permitting it to move in a longitudinal direction.

The reciprocating member 17 carries a tongue 24 that projects through the opening 7a in the bell 7. A base member 25 for a safety razor head has a cup-shaped portion 25a movable over the outer end of the tongue and secured thereto by a screw 26. The base member carries a razor blade guard 27 that may be either integral therewith or secured thereto by screws 27a. This guard has the usual convex portion against which a safety razor blade 28 is held by means of a clamping head 29. In place of the usual comb teeth disposed along the opposite sides of the guard, I provide cylindrical members 30 that will offer a smooth surface against which the skin may contact. The cylindrical members 30 are spaced from adjacent edges 31 and this provides longitudinal slots 32, see Figure 1, through which the cut beard and soap may pass.

The razor blade head 29 is removably secured to the blade guard 27 by pins 33 that extend through openings 34 in the blade 29 and through openings 35 in the blade guard 27. The pins 33 are in turn provided with openings 36 for removably receiving a locking pin 37. A handle 38 on the pin 37 causes the rounded shank of the pin to pass through the openings 36 and to lock the razor head 29 in place. A U-shaped spring 39 extends from the base member 25 and is yieldingly received in a groove 40 formed in the pin 37.

In order to prevent water or any other liquid from gaining access to the moving parts, I provide a rubber sleeve 41 that surrounds the tongue 24 and is secured thereto by any means such as a string 41a. The opposite end of the sleeve 41 is passed over the bell-shaped end 7 of the housing 6 and the tendency of the sleeve to contract is sufficient to frictionally hold the sleeve in place. It will be noted from Figure 2 that the sleeve projects up into the cup-shaped portion 25a and therefore the opening 7a is entirely closed from water.

From the foregoing description of the various parts of the device, the operation thereof may be readily understood.

The razor blade is secured in place in the manner already described, and the device is now ready to function. The two sets of ball-bearings 19 and 20 are preferably packed in grease so that they will operate for an indefinite period of time without any need of attention. The motor shaft 5 has an eccentric portion 5a that is received in a slot 42 formed in the bottom of the carriage 18. The rotation of the shaft 5 will cause the eccentric portion 5a to move through a circle and in turn to oscillate the carriage 18. This oscillation is transmitted to the safety razor head assembly through the tongue 17 and therefore the head and blade will oscillate or reciprocate as a unit and with respect to the casing 1. The rubber sleeve 41 permits relative movement between the base member 25 and the housing 6 and also prevents water from entering the parts. A far closer and more efficient shave is obtained by a rapidly reciprocating blade. A blade may be used for a longer period of time because of this rapid reciprocation and the skin will not be torn and scratched which usually results when a safety razor blade is moved directly over the skin without being reciprocated.

The device may be placed under a water faucet for cleaning after the shaving operation, without any harm resulting to the moving parts. The 75

blade may be removed and dried and then again secured in place or a new one may be substituted therefor, if desired.

In Figure 6 I show the top of the carriage 18 and it will be noted that ball bearings 18' are mounted in recesses in the top. Figure 2 shows the ball bearings 18' riding on the upper inner wall of the channel shaped portion 8. The carriage is yieldingly urged in an upward direction by coil springs 8' that are disposed between the top edge 10 of the casing 1 and the underside of the carriage.

While I have shown only the preferred form of my invention, it should be understood that various changes or modifications may be made within the scope of the appended claims without departing from the spirit of the invention.

I claim:

1. In combination, a casing adapted to be held in the hand, a housing carried by the casing, a carriage disposed in the housing, anti-friction means for supporting the carriage and permitting it to be reciprocated in the housing, means carried by the casing for reciprocating the carriage, a tongue integral with the carriage and projecting beyond the housing, a safety razor guard secured to the tongue and having a portion telescoping the tongue and being spaced therefrom, a rubber sleeve forming a liquid-tight seal with the tongue and with the housing and permitting relative movement therebetween, said sleeve connecting with that portion of the tongue received in the telescoping part of the guard, a blade mounted on the guard, a head overlying the blade, and a pin for removably securing the head in a position to hold the blade on the guard.

2. In combination; a casing; a safety razor head assembly reciprocably carried thereby and including a guard, a blade, and a head; said guard and blade having aligned openings; said head having pins receivable in the aligned openings and projecting beyond the guard openings; the projecting portions of the pins having aligned transversely extending openings; a key insertable through the last named openings; and spring means for holding the key against accidental disengagement from the pins; whereby the parts making up the safety razor head assembly will be held tightly together during the reciprocation of the head.

3. In combination, a casing, a safety razor head assembly including a tongue reciprocably carried by the casing and a guard secured to the tongue and having a cup-shaped end receiving the outer end of the tongue, and a water-proof flexible closure enclosing the tongue and being secured to the tongue portion received in the cup-shaped end to make a water-tight fit with the tongue, said closure also making a water-tight fit with the casing, whereby the cup-shaped end will act as an apron for protecting that part of the closure secured to the tongue.

4. The combination with a motor casing; a housing rigidly secured thereto and having a guide extending in a predetermined direction; a member reciprocably mounted in the housing and having its direction of movement controlled by the guide; means for reciprocating the member; a razor blade assembly rigidly secured to and entirely supported by the member and being reciprocated thereby; said assembly including a guard, a blade, and a head; the member reciprocating the assembly for causing the blade to move in the direction of the length of its cutting edges.

GEORGE E. LA CELL.