

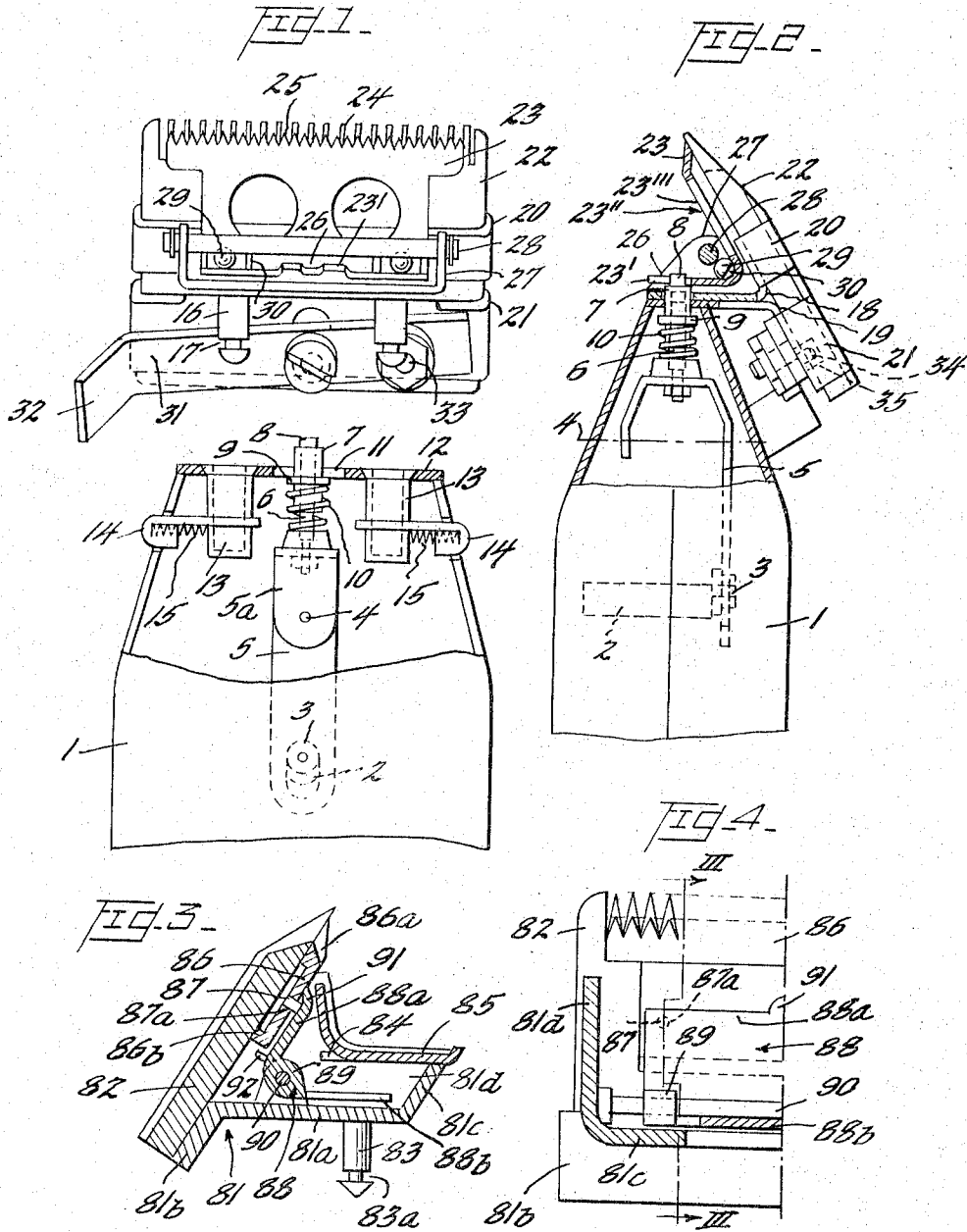
April 18, 1967

V. KOBLER ETAL

3,314,149

HAIR CLIPPERS HAVING A SWINGABLE, RECIPROCABLE CUTTER BLADE

Filed Dec. 30, 1963



INVENTORS
Victor Kobler
 BY *Werner Kobler,*
Sommers & Young
 ATTORNEYS

1

3,314,149

HAIR CLIPPERS HAVING A SWINGABLE, RECIPROCABLE CUTTER BLADE

Victor Kobler, Huttenstrasse 42, and Werner Kobler, Huttenstrasse 43, both of Zurich, Switzerland
Filed Dec. 30, 1963, Ser. No. 334,466
7 Claims. (Cl. 30-222)

Hair clippers are known which are equipped with pairs of blades which touch each other along those entire surfaces of the blades which face toward each other and which blades are under light spring pressure against each other. In order to reduce the frictional resistance and to make it easier to drive the movable blade, models have been suggested in which at least one of the two blades has recesses in the contact surface so that, for instance, the area on which the two blades touch is confined to the forward indented or toothed edges and to the opposite edges.

This invention has for an object to further reduce the friction for the purpose of reducing the stress on the drive mechanism. This invention relates to hair clipper with a motor in a housing having the form of a handle and with a cutting head removably attached to the housing. According to the invention the cutting head has a carrier or base, which is removably attached to the housing and which contains a stationary or fixed blade and a second blade which can be moved angularly around an axle extending parallel to its toothed cutting edge and which can be moved back and forth, that is, oscillated along this axle.

One possible version of this invention comprises the following. The movable blade constitutes a bent plate or bell crank, which is so attached along one axis of the base that it can be moved angularly and axially. This movable blade has its toothed edge bearing under spring pressure, against the toothed edge of the stationary blade. The bent plate or bell crank can be so positioned that it can be moved relative to the base part with only a small amount of friction, both axially and angularly. This may be achieved by using balls in the mounting.

It is best to design the hair clippers involved in this invention in such a manner that the head portion can be separated from the drive portion by means of an easily operated locking mechanism. In this manner the same drive portion can also be used to drive other equipment. Due to the easy operation of the cutting blades, as envisaged according to this invention, it will be possible to use motors with smaller power output than those hitherto used for hair clippers.

By providing a bell crank between the drive unit of the driving motor and the movable blade, one achieves two things: first, this bell crank can be designed as a translation unit for the transmission of the required attachment pressure of the movable blade even if the pressure from the drive unit is relatively weak. Second, the angle between the actuating part and the working part of the bell crank makes it possible, on the one hand, to have the drive unit work at the best angle, that is, at a right angle to the actuating portion, even if the working part and hence the movable blade itself is positioned at an acute angle to the plane of the drive unit of the drive motor as is required in handling the hair clippers.

The drawings show two embodiments of the invention.

FIGURE 1 is a plan view of the hair clippers with a head separated from the handle or grip portion.

FIGURE 2 is a side view of the same model, in partial section and with the head or top portion attached to the handle.

FIGURE 3 is a vertical sectional view along line III-III in FIGURE 4 through the cutting head of a second embodiment of hair clippers according to this invention.

2

FIGURE 4 is a plan view of the cutting head according to FIGURE 3, with the housing arm cut away.

In FIGURES 1 and 2 numeral 1 designates the handle of the clippers. An electric motor is built into or housed in this handle in known manner. In order to simplify the drawing only the rotor shaft 2 with eccentric pin 3 has been shown. The latter acts on a lever arm 5, pivotally mounted on axle 4. This lever arm 5 is swung back and forth in the direction of the arrow when the motor is running. Attached to the upper reciprocating arm 5a of lever 5, is a pin 6, on which is mounted a cap 7 having a closed end 8, with a running fit. This cap penetrates through slot 11 of a handle closing plate 12. Between cap 7 and the upper swinging arm of lever 5 a pressure spring 10 is provided. Shoulder 9 extends over the width of slot 11 and retains cap 7 in the handle closing plate 12.

A pair of casings 13 are provided, one on each side in the handle part, said casings being engaged by catches 14 which are under pressure from springs 15. These casings are used to receive the attachment studs 16 which are attached to the head portion. When the head portion is put on the handle part, catches 14 engage slots 17 of these attachment studs. The top portion can easily be removed again by pressing on those parts of catches 14 which are accessible from the outside and which are located on each side.

The head portion of the clippers is comprised of a carrier part or base which, as can be seen in FIGURE 2, is composed of a front leg 18 and a rear leg 19. Each of these legs 18 and 19 is provided with clamps 20, and 21, respectively, which in turn form a joint holding device for the stationary blade 22 which is gripped on both sides by these clamps. A movable blade 23 cooperates with stationary blade 22. Both blades are provided with teeth 24, and 25, respectively, at their outer edges in known manner.

The movable blade 23 is so designed that it is in direct contact with the stationary blade 22 only along a very narrow section which includes the area of the teeth. In this embodiment the movable blade has the shape of an angular lever or bell crank 23' whose rear arm 23' is provided with a slot 26. When the head portion is put in place, this slot 26 is coupled with end 8 of the lever 7. The front leg 18 of the base has two raised bearing lugs 27, in which axle 28 is mounted. Between the bight of the interior angle of the bell crank 23' and the bearing axle 28, ball bearings 29 are provided which transmit the pressure of spring 10 to axle 28 and which produces a rolling, that is, low friction, angular, and axial movement or oscillation of bell crank 23'. The diameters of the bearing axle and of the ball bearings, as well as the size of the angle formed by arms of the bell crank 23' are so determined that the ball bearings 29 will be retained in the bight of the angle of bell crank 23'. The lateral play of leeway of ball bearings 29 is limited by flanges 30, which are located in the bight of the angle of the bell crank within the axial displacement range of the bell crank.

The size of the interior angle of bell crank 23' and the longitudinal ratio between the forward and the rear arms of the bell crank can be so selected that, in addition to the desired magnitude of the spring pressure, one will have a pressure component acting against bearing axle 28 along the forward arm of the bell crank, said pressure being exerted against the stationary or fixed blade. This pressure is exerted toward the indented end of the bell crank. Between the two arms 23' 23'' of the bell crank 23' and of bearing axle 28, enough leeway is provided so that blade 23 and its narrow running surface, with the area of its indentation, can be accurately directed toward the corresponding surface of stationary blade 22.

This helps cut hair accurately along the entire length of the 2-way track.

Depending on the ratio of length between the two arms 23', 23'' of rocking bell crank 23'' one can make the attachment pressure of the running surface either smaller or larger, for any given spring pressure. This makes it possible to use drive parts now being used, for instance, in electric shaver, massage equipment, and similar equipment. The design of the top part of the clippers according to this invention, thus, can be adapted to this kind of equipment within a broad framework.

Along the rear base part 19 (FIGURE 2) there is provided an adjusting lever 31, which has a grip 32, which is movable about axle 33. Adjusting lever 31 has a catch bolt 34 which engages in a recess 35 in stationary blade 22. By moving the adjusting lever, one can adjust the position of stationary blade 22 with relation to the position of movable blade portion of bell crank 23'' within a useful range. Thus the distance by which the tips of the fixed blade 22 protrude beyond those of movable blade 23 can be adjusted as desired.

The embodiment of the cutting head shown in FIGURES 3 and 4 is provided with a base 81 which has intermediate straight flat portion 81a and a leg 81b for attachment of fixed blade 82 and a leg 81c which extends at an angle to portion 81a. Along the under side of base 81 there are attached two studs 83, only one of which is visible in FIGURE 3. These studs are provided with a ring-shaped slot 83a and can be inserted into the corresponding sockets in a handle containing the motor which is not shown in the drawing. The cutting head shown in the drawing can, for instance, be attached to the housing of an electric shave in place of the shaving head. The middle part 81 and leg 81c are designed in the form of a box open on top, that is, they are provided with side walls 81d. The side walls of this box-like structure on their inside have slots 84, parallel to the middle portion 81a of the base 81, into which are inserted the edges of a lid 85, which bulges inwardly toward blade 82 and serves as a shield to keep hair out of said box-like structure. Inside the box-like structure there has been provided a blade 86 which can be moved back and forth on said fixed blades 82. The toothed cutting portion 86a of this movable blade 86 and its rear supporting part 86b are slidably mounted on fixed blade 82. In the middle portion of movable blade 86 which is raised from blade 82 are provided two recesses 87a in which engage the two catches 87 of pivoted bell crank 88. Bell crank 88 is designed as a two-arm angle lever which includes a working arm 88a, bearing the catches 87, and an actuating arm 88b which forms an acute angle with the working arm. When the pivoted bell crank lever 88 (FIGURE 3) is in working position, working arm 88a runs generally parallel to blade 86, while actuating arm 88b runs generally parallel to the bottom of leg 81a. The actuating lever of the motor, which is not shown, engages actuating arm 88b in a known manner not shown in the illustration. This lever protrudes through a slot 81c (FIGURE 4) in the middle part 81a of base 81 and swings back and forth and at the same time presses on actuating arm 88b with its axis, along the plane running through the axes of studs 83.

Tilting bell crank lever 88 is positioned on axle 90 which is supported on fixed base 81, by means of two bearings 89. This bell crank 88 can be moved back and forth along axle 90. The end of working arm 88a, which is remote from axle 90, in other words, the end of bell crank 88, is designed as a pressure finger 91. This finger transmits the pressure exerted by the drive mechanism on actuating arm 88b to moveable blade 86 in the ratio of the levers depending on the relative lengths of arms 88a and 88b. The end of working arm 88a of bell crank 88, which is closest to axle 90, has a protrusion 92 on the side toward blade 86. When the hair clippers described here are operated, the lever of the

motor, which swings back and forth, moves bell crank 88 back and forth along its axle 90 and in the process presses blade 86 by way of finger 91, against stationary blade 82. In this operation, blade 86 is correspondingly moved back and forth as a result of catches 87 which simultaneously serve as parallel guides. If the lever transmission is properly selected, the pressure exerted by the lever on bell crank 88 will suffice in most cases. If blade 86 is to be taken out for any reason whatever, the cutting head is first disconnected from the motor, whereupon lid 85 is pulled off sides 81d. Because the lever now no longer exerts pressure on the actuating arm 88b of bell crank 88, the latter can be tipped backward by means of pressure from the top on the actuating arm 88b and around its axle 90 so far that catches 87 will be removed from the corresponding recesses in blade 86. At the same time the protrusion 92, which acts as an ejector, now acts on the adjacent end of blade 86 and pushes the latter forward so that it can easily be gripped by hand and taken out. When it is wanted to insert blade 86 again, one proceeds in the opposite manner. Bell crank 88 is tilted backward and blade 86 is pushed into its place, whereby protrusion 92 serves as a stop. If bell crank 88 is again tilted toward blade 86, then catches 87 engage the corresponding recesses in blade 86. As a result, this blade is again connected in its working position. Now the cutting head with studs 83 can again be put on the drive motor, which is designed as the handle. As a result of this, the drive connection between the lever and blade is automatically restored. By pushing lid 85 into slots 84 of sides 81d the inside space of the head, which contains the movable blade and the bell crank, is again closed. In this connection, lid 85 which bulges toward the cutting portion of the blade also serves to cause cut hair to slide off so that the latter will not collect and pile up directly behind the cutting portions of the blades.

What has just been said very clearly illustrates that the cutting heads described are very simple in design and easy to handle. The bell crank makes it possible to produce the desired blade pressure by selecting the lengths of the lever arms accordingly and also guarantees that the blade will be guided in a perfectly parallel manner.

In all previously described versions one can also have attachments which will facilitate the adjustments of the movable blade with respect to the fixed blade, as was described in greater detail in the example illustrated in FIGURES 1 and 2. Because the movable blade can also be easily removed, it can also be exchanged for a smaller or larger blade so that one will not need any special insertion devices.

What is claimed is:

1. In hair clippers of the kind having a head adapted to be mounted on a drive motor housing which serves as a handle, said head comprising a base, a stationary blade mounted on said base and having cutting teeth on its forward edge, an axle, means on said base mounting said axle in spaced relation thereto and parallel with the cutting part of said stationary blade, a two-armed bell crank mounted on said axle with said axle substantially at the junction of said arms, and reciprocable relative to said axle and angularly movable thereabout, a movable blade adjacent and in operative engagement with said stationary blade and having cutter teeth adjacent the teeth of said stationary blade, one of the arms of said bell crank extending forwardly and being drivingly connected with said movable blade, the other arm of said bell crank extending from said axle rearwardly to adjacent said motor housing, drive means extending from said housing and operatively engaging said rear bell crank arm, and spring means pressing on said rear arm to tend to resiliently rotate said bell crank about said axle, and press said movable blade against said stationary blade,

5

2. Hair clippers according to claim 1, and in which said movable blade is formed of said forward arm of said bell crank.

3. Hair clippers according to claim 1, and in which said movable blade is a separate piece from said forward arm of said bell crank. 5

4. Hair clippers according to claim 1, and in which the movable blade is a separate piece from said forwardly extending arm, said forwardly extending arm have two spaced catches, and said movable blade having two spaced recesses in which said catches engage, respectively, for guiding and driving said movable blade. 10

5. Hair clippers according to claim 4, and in which said forwardly extending blade-engaging arm of said bell crank is provided with a protrusion operably engaging said movable blade and serving as an ejector for said movable blade. 15

6. Hair clippers according to claim 1, and in which said base is provided with side walls providing an open-top box-like structure accommodating said axle and bell 20

6

crank, and a lid mounted on said side walls serving as a shield to keep hair from inside said structure.

7. Hair clippers according to claim 1, and in which said stationary blade is mounted slidably adjustably forwardly and rearwardly relative to said movable blade, and manually operable means mounted on said base operably engaging said stationary blade for effecting said adjustment.

References Cited by the Examiner
UNITED STATES PATENTS

2,098,180	11/1937	Dilks	30-221
2,292,858	4/1942	Alexay	30-34.1
2,371,242	3/1945	Jensen	30-34.1
2,778,106	1/1957	Hazelquist	30-224 XR
2,787,829	4/1957	Bayne	30-224 XR

WILLIAM FELDMAN, *Primary Examiner.*

J. C. PETERS, *Assistant Examiner.*