Oct. 18, 1966 M. ANDIS 3,279,062

CLIPPER WITH SNAP ACTION DETACHABLE HEAD

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FIG. 1.

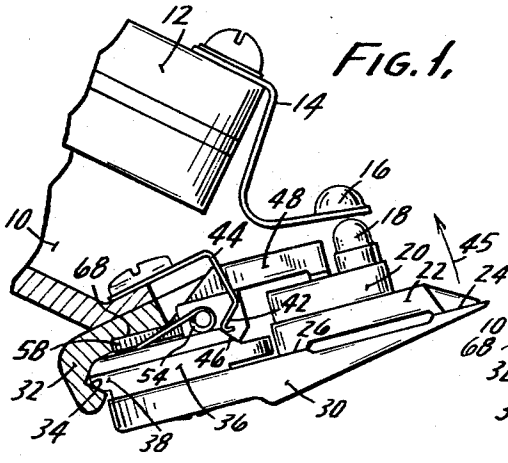


FIG. 2.

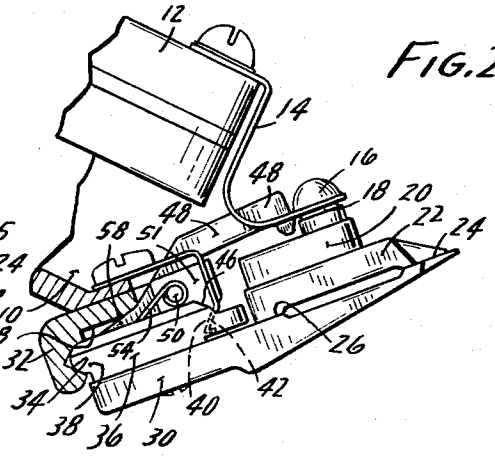


FIG. 3.

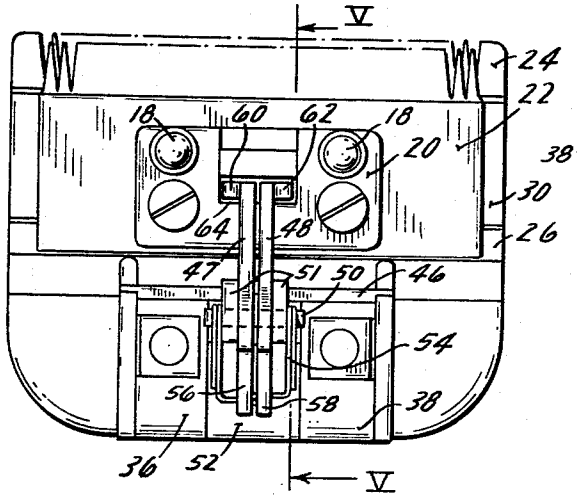
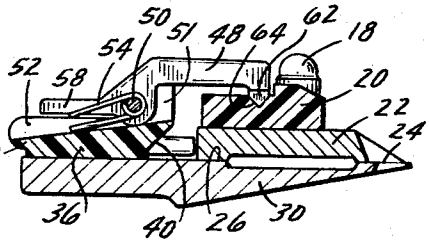


FIG. 5.



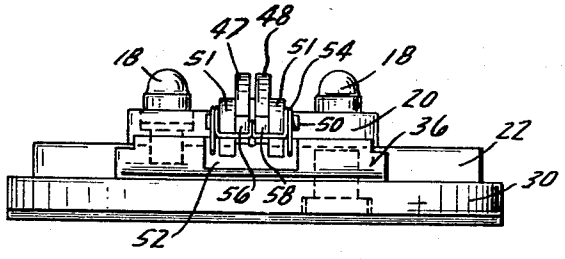


FIG. 4.

INVENTOR.
MATHEW ANDIS
BY
Wheeler, Wheeler & Wheeler
ATTORNEYS

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FIG. 6.

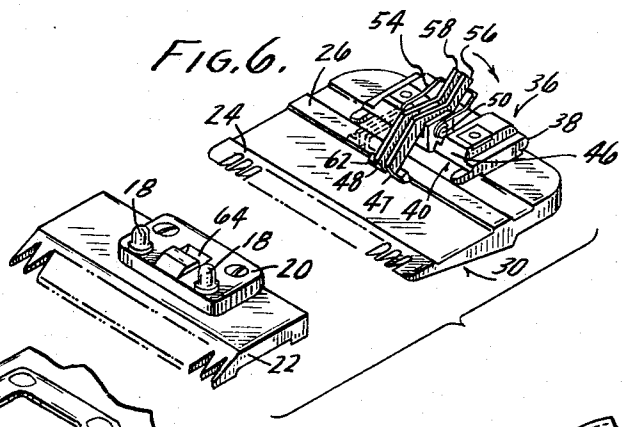


FIG. 7.

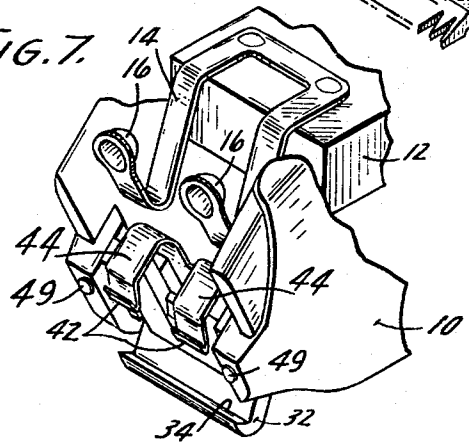


FIG. 8.

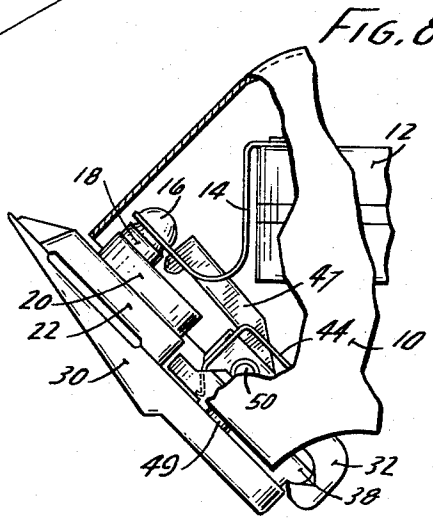
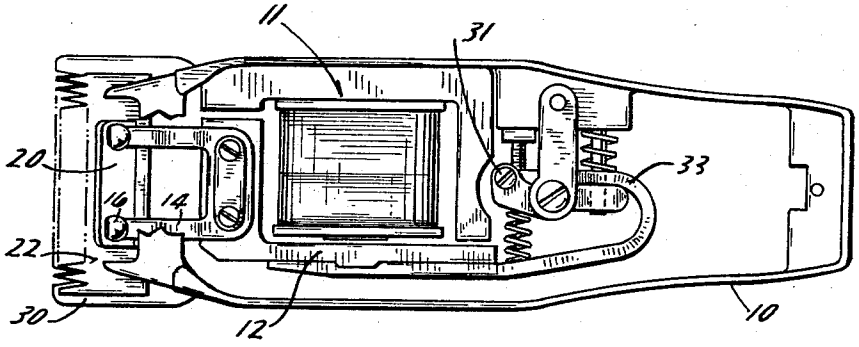


FIG. 9.



INVENTOR.
MATHEW ANDIS
BY
Wheeler, Wheeler & Wheeler
ATTORNEYS.

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CLIPPER WITH SNAP ACTION DETACHABLE HEAD

Mathew Andis, Racine, Wis., assignor to Andis Clipper Co., Racine, Wis., a corporation of Wisconsin

Filed Mar. 13, 1964, Ser. No. 351,733
8 Claims. (Cl. 30—210)

This invention relates to a hair clipper and has particular reference to the type of clipper using a vibratory motor.

Especially when a clipper is designed for cutting human hair, it is convenient to provide interchangeable comb blades to cut the hair at differing distances from the scalp. Some clippers having rotary motors have been provided with interchangeable sets of paired comb blades and reciprocating blades, but this has not been practicable for clippers having vibratory motors, the reason being that such motors do not have sufficient power to actuate the reciprocating blade of such a set if the set has permanently acting retaining means for holding the blades in assembly.

The present invention makes it practicable for the first time to interchange in sets paired comb and reciprocating blades which have means for holding them in assembly when they are detached from the rest of the clipper. To achieve this result, the present invention contemplates an arrangement such that when the clipper is in use the movable blade is subject solely to the tension communicated to it through the vibratory armature. When the blades are detached from the rest of the clipper, they remain assembled as a unit, being maintained in assembly by separate clamping means which become disengaged automatically when the assembly is mounted on the clipper frame and become re-engaged automatically when the blade assembly is detached from the frame.

The comb blade has a positioning block desirably made of synthetic resin which is rigidly mounted thereon and serves to align the comb blade with the clipper case when the parts are assembled. This block also is used to connect the blade assembly releasably to the comb blade. At its rear margin, the block may have a tongue for which the frame provides a groove, whereby the blade assembly may pivot with respect to the clipper frame during attachment and removal. At its forward margin, the block further includes means coacting with a detent on the clipper frame which snaps into position during assembly and can be released by exerting sufficient pressure on the comb blade to disengage the detent.

Mounted on the detent block and connected with the comb blade are one or more pivoted latch levers which function in unison and include terminal portions releasably engaged with a socket in the reciprocable blade of the set. When the latch levers are so engaged, the reciprocable blade is held securely to the comb blade so that the two can be handled unitarily in application to or removal from the clipper frame. However, the rear end portions of the latch lever or levers extend aft of the fulcrums in a position to engage an appropriate seat on the clipper frame in a position such that as the blade assembly snaps into the position on the clipper frame the aft ends of the lever or levers are engaged by the seat of the frame and actuated about their fulcrums in a manner to lift the forward ends of the levers completely free of the vibratory blade. It happens at the same time that the vibratory blade is engaged by the socketed extremities of the actuating arm leading thereto from the armature of the vibratory motor, thereby leaving the reciprocable blade subject solely to the action of said arm both for operation and for tensioning.

In the drawings:

FIG. 1 is a fragmentary view partially in side elevation and partially in section showing the forward end of the clipper case and a paired blade assembly as it appears in the process of being attached to the casing.

FIG. 2 is a view similar to FIG. 1 showing the blade assembly securely attached to the case.

FIG. 3 is a plan view of the blade assembly.

FIG. 4 is a rear elevation of the blade assembly.

FIG. 5 is a view taken in section on the line 5—5 of FIG. 3.

FIG. 6 is a view showing in perspective the relatively separated comb blade and reciprocable blade of a blade assembly embodying the invention, the parts being shown on a somewhat reduced scale.

FIG. 7 is a fragmentary view in perspective of the forward end of a clipper case as it appears when the blade assembly is detached.

FIG. 8 is a fragmentary view of the clipper case in side elevation with portions broken away, the blade assembly being attached thereto.

FIG. 9 is a view fragmentarily showing the magnet and armature as mounted in the clipper.

In accordance with conventional practice, the clipper frame **10** comprises a case for the motor. The motor illustrated includes the usual magnet **11** and an armature **12** which is tuned to oscillate in synchronism with the frequency with which the motor is energized by the alternating current or interrupted current supplied thereto. As best shown in FIGS. 7 and 8, the armature carries a pair of spring arms **14** having terminal cups **16** which receive the convexly headed posts **18** that project upwardly from a plate **20** mounted on the reciprocable blade **22**. Not only is the vibration of the armature **12** communicated to the reciprocable blade **22** for reciprocating it back and forth on the bearing surfaces **24** and **26** of the comb blade **30**, but the arms **14** are also used to maintain the proper tension. In the instant device, the tension is adjustable by means of a screw which is shown at **31** and which bears on an arm **33** of armature **12**. Any one of a number of tension adjusting devices may be used to exert thrust on the reciprocable blade toward the shear blade, examples being shown in United States Patent 2,790,236 and in my pending application 170,323, filed February 1, 1962. In a clipper actuated by a vibratory motor, it is essential that the tension be accurately controlled because the reciprocable blade must be firmly seated on the comb blade at the proper height. Yet the tension must not be excessive because this will create friction of the reciprocable blade upon the comb blade of such magnitude that the motor may not vibrate at the desired amplitude of stroke.

Means is provided for maintaining the reciprocable blade assembled to its particular comb blade for unitary handling when the blades are detached from the clipper frame. Because the connecting means required for this purpose would result in excessive friction between the blades if it were permanently effective, I have provided means whereby it becomes effective only when the assembly is detached from the clipper frame.

As best shown in FIGS. 1 and 2, the clipper frame **10** carries at its forward end a shoe **32** having a forwardly directed groove or channel **34**. Mounted on the comb blade **30** at the rear end thereof is a block **36**, desirably made of synthetic resin, which has a rearwardly projecting tongue or rib **38** which is generally cylindrical in transverse section and is receivable into the channel **34**.

The forward margin of block **36** is undercut at **40** to receive the hooks **42** of one or more springs **44** (see, also, FIG. 7). Beveled surfaces **46**, best shown in FIGS. 1 and 6, guide the hooks **42** of springs **44** toward the undercut recesses **40** into which the hook ends **42** of springs **44** are received in the assembly of parts shown in FIG. 2. The detent springs **42** engage the forward margins

of the same positioning block **36** which provides the tongue and groove connection of the rear margin of such block with the clipper frame to hold the block, and the blade assembly, securely to the clipper frame. Yet the blade assembly can be disengaged from the clipper frame by exerting sufficient force downwardly on the free forward margin of the blades to cause the assembly to oscillate on a fulcrum provided between tongue portion **38** of the block and groove **34** of the frame. Such pivotal movement of the assembly is resisted strongly by the springs **44** until the hooks **42** at the ends of the springs clear undercut recesses **40**, whereupon the blade assembly is completely detached from the clipper.

In FIG. 1 the arrow **45** shows the assembly in movement in an engaging direction opposite to that above described. In this operation, the tongue or rib **38** is fulcrumed in the groove **34** as above described and the beveled surface **46** guides the hook ends **42** of the spring or springs **44** to a position such that these will snap into the recesses **40** when the parts reach the assembled position shown in FIG. 2.

The studs or bosses **49** (FIG. 7 and FIG. 8) provide accurately finished surfaces against which the comb blade seats.

With the blade assembly in position on the casing as shown in FIG. 2, the cups **16** at the end of the spring arms **14** are securely engaged with the respective posts **18** of the reciprocable blade **22** to transmit to this blade the vibratory movement of the armature **12** and the tension controlled by the adjusting screw **31** as above described. Thus, when the clipper is in use, the bias of the reciprocable blade to the shear blade is controlled by the tension adjustment in any customary or appropriate manner. However, in the position of the parts shown in FIG. 1 and in FIGS. 3 to 5, the posts **18** are out of contact with the cups **16** of spring arms **14** and there is therefore nothing in the normal clipper assembly that is capable of either controlling the lateral position of the reciprocable blade or even holding it in assembly on the bearing surfaces **24** and **26** of the comb blade.

To maintain the blades in assembly when they are thus separated from the clipper frame, I provide a lever or levers **47**, **48**, two such levers preferably being used. They are pivoted on a cross pin **50** carried by ears **51** of the mounting block **36**. The levers are disposed between the ears in a recess **52** of such block. A spring **54** has an intermediate portion passing transversely beneath the aft ends **56**, **58** of the levers **47**, **48**. As clearly appears in FIGS. 3, 4 and 5, the spring is coiled about the ends of the pintle **50** and engaged with the mounting block at **36** to exert a bias on the levers **47**, **48** which tends to oscillate them clockwise as viewed in FIG. 5.

The free forward ends of the levers have fingers **60** and **62**, respectively (FIG. 3 and FIG. 5) which, in the position of the parts shown in FIGS. 1, 3 and 5 are firmly engaged in a socket **64** provided in a block **20** which is carried by the reciprocable blade **22** and may conveniently have posts **18** integrally formed therewith.

The shoe **32** on the clipper frame has a thrust surface **68** in a position to be engaged by the rear ends **56** and **58** of the detent levers **47** and **48**. In the position of the parts shown in FIG. 1, the rear ends of the levers have just engaged the surface **68** of the shoe **32** but the forward extremities **60** and **62** of the detent levers are still engaged in the recess **64**. As the assembly is snapped from the position of FIG. 1 to that of FIG. 2, the surface **68** effects counterclockwise oscillation of the levers **47** and **48** to lift the fingers at their forward extremities from the block **20** on the clipper blade **22**, thus completely freeing the reciprocable blade of detent lever restraint. As already noted, the same action of mounting blade assembly on the clipper frame has engaged the cups **16** of the spring arms **14** with the post **18** of the reciprocable blade, thus substituting the vibration and

tension control of the armature for the restraint provided by the detent.

Conversely when the blade assembly is disengaged from the frame, the same motion which releases the posts **18** from the spring arms **14** also releases the detent levers **47**, **48** to allow such levers to be oscillated by their biasing spring **54** to engage their forward ends with the block **20** of the movable blade **22**, thereby holding such blade securely to the comb blade for unitary handling.

In both directions of engaging and disengaging movement, the interchange of control of the movable blade as between the spring arm **14** of the armature **12** on the one hand and the detent **64** carried by the comb blade, on the other hand, is entirely automatic in the sense that conscious manipulation by the operator is not required. The whole operation, in both directions, is a function of the bodily movement between the blade assembly and the clipper frame.

While only one set of blades has been illustrated, it will be understood that matched pairs of blades, each pair comprising an assembly of a comb blade and a reciprocating shear blade, will be made up to cut hair in different lengths, the sets of paired blades being freely interchangeable with each other by the means herein disclosed. It will be observed that the operating connections both for the mounting and operation of the parts as herein disclosed are all independent of the thickness of the respective blade or blades of any such set. The plastic blocks **36** and **20** can be applied to the blades of any such assembly.

I claim:

1. In a hair clipper, the combination with a frame and an oscillatory driving member mounted thereon, of a set of unitarily detachable blades, one of which comprises a comb blade and the other a cutting blade reciprocable on the comb blade transversely of the frame, releasable clamp means for holding the blades in assembly when they are not mounted on the frame, releasable means for connecting the comb blade to the frame, the frame and comb blade having cooperating parts engageable when the comb blade is being connected with the frame, one of said parts being fixed to the frame and one of said parts being pivotally mounted on the comb blade and having a spring biasing it to a position from which it is displaced by the part fixed to the frame as the comb blade is connected to the frame, and means for transmitting motion from the spring biased part to the said releasable clamp means to cause the clamp means to hold the blades in assembly when they are dismounted from the frame, the said displacement of the spring biased part as the comb blade is connected to the frame being adapted to release the blades from being held by said clamp means.

2. In a hair clipper, the combination with a comb blade and a cutting blade reciprocable on the comb blade, of a clipper frame, releasable means for detachably connecting the comb blade with the frame, a vibratory motor mounted on the frame and having a driver provided with means for detachably connecting it with the cutting blade for the reciprocation thereof, said means being freely disengageable in the course of disconnection of the comb blade from the frame, means operable through the driver and wholly responsible for regulating the tension of the cutting blade upon the comb blade during driver reciprocation of the cutting blade, and releasable clamp means for holding the cutting blade in assembly upon the comb blade when the comb blade is disconnected from the frame and from the driver, said clamp means having an operating lever pivoted to one of said blades in a position for engagement with the frame in the mounting of the comb blade on the frame for displacement of said lever in a direction for rendering said clamp means ineffective when the comb blade is connected with the frame.

3. A hair clipper according to claim **2** in which said latch means includes mechanism for connecting and disconnecting said clamp means automatically in the

course of the disconnection and connection of the comb blade with the frame.

4. In a hair clipper, the combination with a set of unitarily detachable blades, one of which comprises a comb blade and the other a cutting blade reciprocable on the comb blade, of a first block mounted on the comb blade, a second block mounted on the cutting blade, latch lever means pivoted on the first block and having end portions engageable with the second block and constituting means for clamping said blades in assembly and means for operating said latch lever means to and from engagement with the second block.

5. A combination according to claim 4 in further combination with a hair clipper frame, means mounted on the frame for detachably connecting the first block with the frame for mounting and dismounting said blades, said means including portions of said lever means and a surface of said frame with which such portion is engageable and disengageable in the mounting and dismounting of the comb blade.

6. A combination according to claim 4 in which a motor is mounted in the frame and has a motor-actuated driver projecting from the frame, the second said block having means engaged by the driver and releasable therefrom in the mounting and dismounting of the comb blade.

7. In a hair clipper, the combination with a frame and a motor thereon provided with a blade driver, of a blade set comprising a comb blade and a reciprocable cutting blade, dismountable means for mounting said comb blade and cutting blade on the frame and including a block mounted on the comb blade, said block and frame having complementary tongue and groove means extending transversely of the frame and providing a pivotal connection between the frame and comb blade at the rear of said block, said mounting means further including spring means mounted on the frame and provided with hook means for which the forward side of the block provides a recess, the hook providing a releasable connection between the frame and the comb blade at the front of the block, a detent lever means having a pivotal connection with the block and extending forwardly therefrom, a second block mounted on the cutting blade and having a

socket with which said detent lever means is releasably engageable, the detent lever means and frame having complementary parts engaged in the mounting of the cutting blade on the frame in a direction to release said detent means from the second block, the detent means having biasing means for engaging it with the block upon the dismounting of the cutting blade from the frame, and means connected with the cutting blade and engageable with the driver and disengageable therefrom respectively in the mounting and dismounting of the cutting blade with respect to the frame.

8. In a hair clipper, the combination with a frame having a vibratory motor which includes an armature provided with a driver, a blade set adapated to be detachably mounted on and released from said frame and including a comb blade and a cutting blade reciprocable on the comb blade, means for releasably mounting the comb blade on the frame, means for releasably clamping the cutting blade to the comb blade, a lever pivotally mounted on the comb blade and movable between blade clamping and blade releasing positions, a spring biasing the lever toward blade clamping position, and means on the frame engaging the lever to displace it from blade clamping position against the bias of said spring upon operation of the mounting means to mount the comb blade on the frame, the said lever thereby selectively operating the clamping means in alternation with said mounting means, and mechanism for connecting the cutting blade to receive motion from the driver when the mounting means is operative to mount the blade set on the frame.

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WILLIAM FELDMAN, *Primary Examiner.*

J. C. PETERS, *Assistant Examiner.*