Feb. 20, 1951 C. VAN ARMBRUSTER ET AL 2,542,378

ELECTRIC HAIR CLIPPER

Filed Dec. 18, 1947 2 Sheets-Sheet 1

Fig. 1.

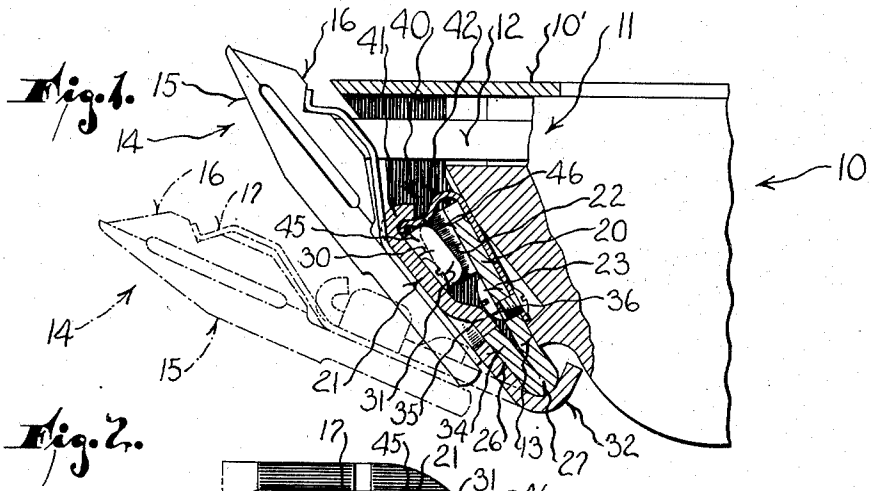


Fig. 2.

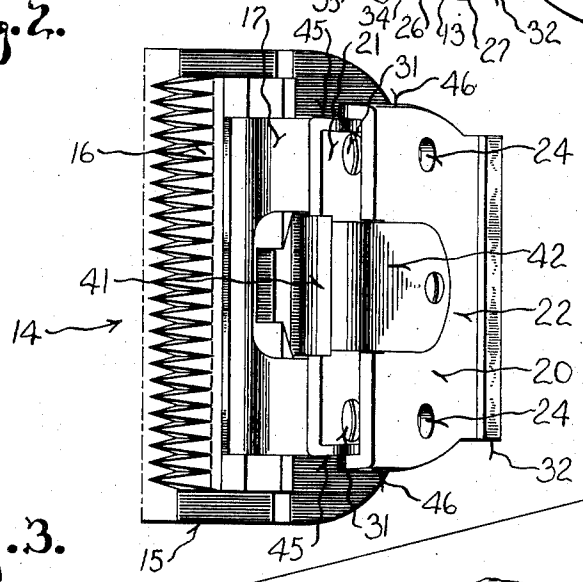
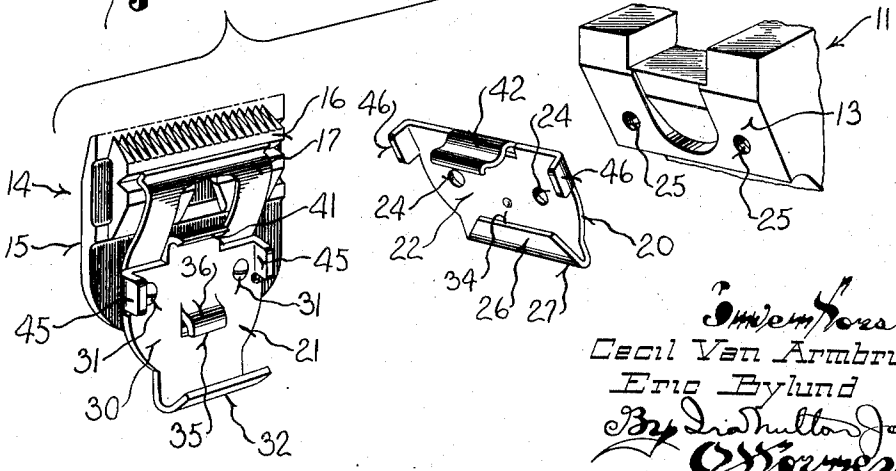


Fig. 3.



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Feb. 20, 1951 C. VAN ARMBRUSTER ET AL 2,542,378

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2 Sheets-Sheet 2

Fig. 4.

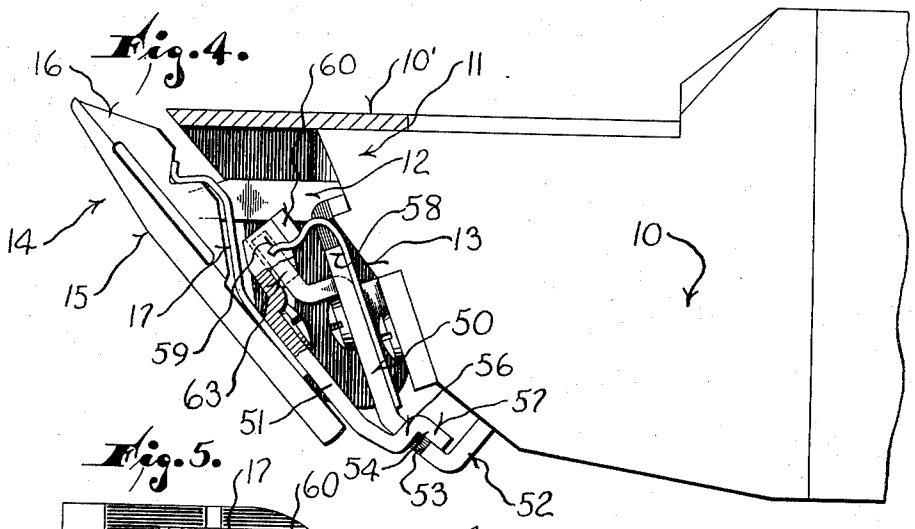


Fig. 5.

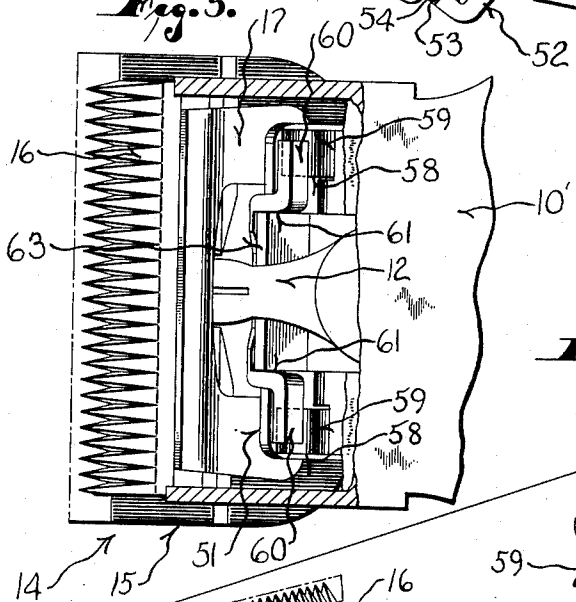
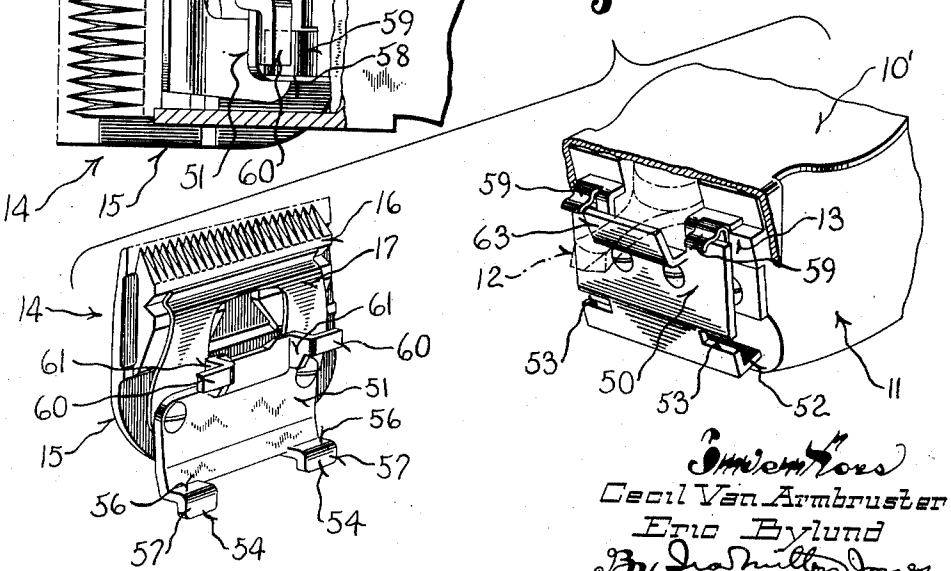


Fig. 6.



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UNITED STATES PATENT OFFICE

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ELECTRIC HAIR CLIPPER

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3 Claims. (Cl. 30—196)

1

This invention relates to electric hair clippers and has more particular reference to clippers of the type embodying detachable cutting head assemblies such as those of Patents 1,956,042 and 2,182,597 issued to John Oster April 24, 1934 and December 5, 1939 respectively.

The provision of readily detachable cutting heads for hair clippers of the type herein concerned has the advantage of affording interchangeability of heads for different types of clipping and the ready removability of the cutting heads to enable their sterilization.

In the past such cutting head assemblies were customarily detachably connected with the clipper bodies by means including a permanent hinge carried either by the clipper body or the cutting head.

The main object of the present invention resides in the provision of an improved readily detachable hinge connection between the cutting head and the body of the hair clipper which features simplicity and low cost of manufacture but which assures adequate rigidity of the head while the same is in its operative cutting position.

More specifically this invention has as an object to provide a readily separable hinge connection between the body of a hair clipper and its cutting head wherein cooperating hinge parts, one fixed with relation to the cutting head and the other fixed with relation to the body have a readily detachable connection with one another.

With the above and other objects in view, which appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claims.

The accompanying drawings illustrate two complete examples of the physical embodiment of the invention constructed according to the best modes so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a side elevational view of the front portion of a hair clipper having the improved readily separable hinge connection of this invention between the cutting head and the clipper body;

Figure 2 is a detail view looking at the inner side of the cutting head assembly and showing the body carried part of the hinge connection

2

separated from the body and engaged with the cutting head carried hinge part;

Figure 3 is a separated or group perspective view showing the cutting head, a portion of the front of the clipper body to which the cutting head is adapted to be attached, and the elements of the readily separable hinge connection between the cutting head and the clipper body;

Figure 4 is a view similar to Figure 1, but illustrating a slightly modified form of the invention;

Figure 5 is a top view of the clipper shown in Figure 4 with portions of the cover broken away to better show the elements of the hinge connection between the cutting head and the clipper body; and

Figure 6 is a perspective view of the clipper shown in Figure 4 illustrating the cutting head detached from the clipper body.

Referring now more particularly to the accompanying drawings in which like numerals designate like parts, the numeral 10 generally designates the body of an electric hair clipper, only the forepart 11 of which is shown. As is usual in hair clippers of the type herein concerned, the body 10 serves as a housing for the electric motor which drives the clipper and cooperates with a sheet metal cover 10' to enclose the driving instrumentalities (not shown) by which the drive lever 12 is oscillated.

The drive lever 12 projects from the front of the clipper body, which is inclined as at 13, and extends toward the cutting head 14 carried by the body at the extremity of the forepart 11 thereof.

The cutting head comprises the usual stationary cutting blade 15, a movable cutting blade 16 overlying the top face of the stationary blade at the forward extremity thereof in the usual manner, and a cutter tensioning spring 17 carried by the stationary blade 15 for pressing the movable cutter flatwise against the top surface of the stationary cutting blade. The tension spring 17 also serves to constrain the movable cutting blade 16 to lateral reciprocation and such reciprocation is effected by means of a driving connection between the forward extremity of the drive lever 12 and the movable cutting blade which is effected in a well known manner.

In accordance with this invention, the cutting head 14 is readily detachably connected with the forepart 11 of the clipper body by means of hinge parts or brackets 20 and 21 both formed as inexpensive sheet metal stampings. The bracket 20 comprises a relatively flat base 22 flatwise engaged against the inclined surface 13 on

the forepart of the body and fixed thereon by means of screws 23 which pass through suitable apertures 24 in the base 22 and thread into suitable tapped holes 25 in the body.

A lower portion of the base adjacent to the rear edge of the stationary cutting blade 15 is bent outwardly away from the clipper body and then back upon itself as at 26 with the exterior of the bend providing a fulcrum 27 remote from but substantially parallel to the cutting edge of the cutting assembly.

The hinge part 21 likewise comprises a relatively flat body portion 30 overlying the top side of the stationary cutting blade rearwardly of the movable cutter and fixed to the stationary cutter by screws 31 which thread into tapped holes in the stationary blade. The screws 31 also pass through the tension plate 17, the lower end of which lies between the hinge bracket 21 and the stationary cutting blade, to fix the tension plate onto the stationary cutter.

The lower part of the body portion 30 projects rearwardly beyond the rear edge of the stationary cutting blade and is bent upwardly as shown best in Figure 3 to provide a hook 32 which acts as a socket to receive the fulcrum 27 on the body carried hinge part.

The engagement of the fulcrum in the socket 32 thus provides a hinge connection between the cutting head and the clipper body which is established upon edgewise motion of the cutting assembly, cutting edge foremost, in a direction to hook the part 32 over the fulcrum 27. The hinge connection thus allows flatwise swinging motion of the cutting head on an axis remote from but parallel to the cutting edge of the head between an operative cutting position, as shown in full lines of Figure 1, and an inoperative position such as indicated in construction lines and in which latter position the cutting head is readily detachable from the body in an obvious manner.

When in its operative cutting position, the cutting head is held against edgewise motion in a direction to disengage the hinge connection by cooperating abutments 34 and 35 on the body and head carried hinge parts respectively. The abutment 34 is provided by the extremity of the folded-back portion 26 of the body carried hinge part, while the abutment 35 constitutes the free edge of an upwardly struck lip 36 on the medial portion of the cutter carried hinge part 21.

Attention is directed to the fact that the abutments cooperate with one another only in the operative cutting position of the cutting head, and that detachment of the head from the body requires flatwise swinging motion of the head to carry the cutting edge thereof away from the body to thereby effect disengagement or disalignment of the abutments from one another.

Flatwise swinging motion of the cutting head out of its operative cutting position is normally precluded by a detent structure 40. The detent structure 40 includes a lip 41 at the upper edge of the head carried hinge part 21 rolled back toward the body 30 of the hinge part 21 to be engaged by a spring 42 carried by the body carried hinge part 20 and shaped to be cammed under to snap behind the lip 41 upon motion of the cutting head to its operative cutting position; such engagement between the spring and the underside of the lip 41 exerting a substantial but yielding pressure on the lip by which the cutting head is restrained against accidental displacement out of its operative cutting position. The spring 42 in cooperation with the lip 41 thus provides a latch operable to releasably hold the cutting head assembled with the clipper body.

Inasmuch as the driving force applied to the movable cutting blade by the oscillatory drive lever 12 has the tendency to swing or vibrate the entire cutting head laterally in the direction of the hinge axis and in line with reciprocatory motion of the movable cutting blade, means is also provided to insure against lateral play of the cutting head at all times. For this purpose the hinge part 21 on the cutting head assembly is provided with a pair of laterally spaced flanges 45 struck upwardly from the opposite side edges of the body of the part 21, with the flanges converging slightly toward their outer end portions.

Cooperating flanges 46 struck downwardly from the opposite side edges of the hinge part 20 on the clipper body and having a slight outward divergence are adapted to engage over the outer sides of the flanges 45 on the cutter carried hinge part with a wedge-like action upon pivotal motion of the cutting head to its operative cutting position. It will be noted that these interengaging flanges on the two hinge parts have their engaging surfaces disposed crosswise of the line of reciprocation of the movable cutting blade and that the same are located close to the movable cutting blade and remote from the hinge axis about which the cutting head swings.

In the operative cutting position of the head, therefore, the detent-like latch, the interengaging wall surfaces of the flanges 45 and 46, and the engaging abutments 34 and 35 cooperate with one another to eliminate all play between these parts. In this respect it is desired to point out that the engagement of the detent spring 42 with the underside of the lip 41 on the hinge part 21 is such as to exert a force on the cutting head assembly tending to swing the same on its hinge axis inwardly toward the adjacent end of the clipper body thereby assuring secure wedging of the interengaging flanges 45 and 46 together.

To detach the cutting head from the clipper body it is only necessary to apply a force on the cutting head in a direction to swing the cutting edge thereof away from the clipper body and sufficient to overcome the force of the detent spring 42. This force may be applied to the cutting head by the thumb of the same hand by which the operator holds the clipper, if desired. After separation of the detent-latch elements, the cutting head is swung on its hinge connection with the body toward a position such as illustrated in construction lines in Figure 1, or at least through an arc of a magnitude sufficient to effect disalignment between the cooperating abutments 34 and 35, thereupon freeing the cutting head for edgewise movement rearwardly to disengage the fulcrum 27 from the socket on the hinge part 21. Assembly of different cutting heads with the clipper body is, of course, accomplished by reversing this procedure.

In the modified embodiment of the invention illustrated in Figures 4 to 6, inclusive, the cutting head is substantially the same as that hereinbefore described but a slightly different type of hinge connection between the head and the clipper body is provided.

As here shown, cooperating hinge parts 50 and 51 are fixed to the clipper body and the cutting head respectively. The body carried hinge part 50 overlies the inclined surface 13 at the forward extremity of the clipper body as in the previous

embodiment but has its rear portion adjacent to the underside of the clipper body spaced from the clipper body by means of an upwardly directed flange 52 struck from the hinge part and engaged with the clipper body. Just above the flange 52, the hinge part 50 is provided with a pair of laterally spaced apertures 53 in the nature of notches extending inwardly toward one another from the opposite side edges of the hinge part.

The lower end of the head carried hinge part 51, which projects beyond the rear of the stationary cutting blade, has a pair of laterally spaced hook-like extensions 54 thereon which are offset from the body of the hinge part 51 toward the clipper body and shaped to enter the apertures 53 in the body carried hinge part for the provision of a readily separable hinge connection between the cutting head and the clipper body. Engagement of the hook-like extensions 54 in their cooperating apertures 53 is, of course, effected with the cutting head held in a condition such as illustrated in construction lines in Figure 1 and upon establishment of this connection the cutting head may be swung to its operative position shown in Figure 4 about a hinge axis parallel to the line of reciprocation of the movable cutter but remote therefrom and defined by the engagement between the hook-like extensions 54 and the side edges of the apertures 53.

Attention is directed to the fact that the hook-like extensions 54 each comprise a neck portion 56 which projects through its corresponding aperture 53 in the operative position of the cutting head, and a flange portion 57 which flatwise engages with the side of the body carried hinge part remote from the cutting head. The flanges 57 thus preclude flatwise motion of the cutting head away from the clipper body while the necks 56 of the hook-like extensions are adapted to engage the upper lateral extremities of the apertures as shown in Figure 4 to preclude edgewise motion of the clipper head relative to the body forwardly in the direction in which the cutting edge of the assembly points.

Edgewise motion of the cutting head rearwardly out of the position illustrated is precluded by means of a detent spring 58 carried by the body hinge part 50. The spring 58 has opposite laterally spaced detent portions 59 adjacent to the opposite sides of the hinge part 50 bent forwardly toward the cutting head assembly and shaped to provide one of the elements of a spring detent. The detent elements which cooperate with the detent portions 59 are formed integral with the hinge part 51 on the cutting head and comprise laterally directed wings 60 bent from the extermities of spaced outwardly diverging flanges 61 struck up from the body of the hinge part 51 at its upper end adjacent to the movable cutting blade.

The wings 60 are spaced a substantial distance above the main portion of the hinge part 51 and are substantially parallel to the plane of the stationary cutting blade, and the lower edges of these wings engage with the free extremities of the detent portions 59 during pivotal motion of the cutting head to its operative position to cam the spring downwardly and thereby allow engagement of the extremities of the detent portions 59 behind the wings and consequently to releasably latch the cutting head firmly in its operative position.

Attention is directed to the fact that the detent portions 59 urge the cutting head forwardly in the direction in which the cutting edge of the assembly points so as to maintain the necks 56 of the hook-like extensions 54 firmly engaged against the upper sides of the notches 53 in the body carried hinge part, thus eliminating the tendency for vibration of the cutting head in a direction normal to reciprocatory motion of the movable cutting blade.

Vibration of the cutting head assembly laterally in the direction of reciprocation of the movable cutting blade is precluded by the engagement of the opposite side edges of a tongue 63 struck downwardly from the upper portion of the body carried hinge part 50 with the inner surfaces of the outwardly diverging flanges 61 on the cutter carried hinge part 51 with a wedge action.

From the foregoing description taken in connection with the accompanying drawings, it will be apparent that this invention represents a simple but highly desirable improvement in the attachment of unitary cutting assemblies to the bodies of hair clippers without sacrificing rigidity of the cutting assembly while the same is in its operative cutting position.

We claim:

1. In a hair clipper of the type having a body and a cutting head at the front of the body including a stationary cutting blade and a cooperating movable cutting blade reciprocable crosswise of the body, means detachably connecting said cutting head with the body comprising: a pair of cooperating hinge elements, each comprising a unitary part, one secured on the body and one secured on the stationary cutting blade, one of said hinge elements having a hooked portion remote from the cutting edge of the head and the other having a shoulder adapted to be readily detachably engaged by said hooked portion upon substantially edgewise motion of the cutting head relative to the body in one direction transverse to the direction of blade reciprocation to thereby establish a hinge connection between the cutting head and the body by which the cutting head may be swung flatwise rearwardly about an axis parallel to the direction of blade reciprocation from a disassembling position with its blades spaced from the front of the body to an operative position with its blades adjacent to the front of the body, cooperating abutments on the hinge elements providing surfaces parallel to the hinge axis and adapted to interengage when the cutting head is swung to its operative position to thereby preclude hinge disconnecting relative motion between said hinge elements, said hinge elements also having cooperating abutments providing surfaces normal to the hinge axis and interengaged when said cutting head is in its operative position to preclude sideward relative displacement of the hinge parts in the direction of blade reciprocation; and means for yieldingly holding the cutting head against swinging motion to its disassembling position, said means comprising a keeper integral with one of said hinge elements, and a spring detent carried by the other hinge element and engaged behind said keeper in the operative position of the cutting head.

2. The structure set forth in claim 1 further characterized by the fact that said spring detent includes a spring element bearing against the keeper in such a manner as to exert upon the hinge element carried by the cutting blade a force which is in the direction in which the hinge

connection between the elements is established.

3. In a hair clipper of the type having a body and a unitary cutting head at the front of the body including a stationary cutting blade and a cooperating movable cutting blade reciprocable crosswise of the body, means detachably connecting said cutting head with the body comprising: a hinge plate fixed on the body and having a pair of apertures; a second hinge plate fixed on the stationary cutting blade at the rear portion thereof and having laterally spaced hook-like extensions projecting from the rear of the stationary blade and adapted to be received in said apertures in the first-named plate to provide a readily separable hinge connection between the cutting head and the body whereby engagement of said hook-like extensions in the apertures of said first-named hinge plate enables flatwise swinging motion of the cutting head to and from an operative cutting position adjacent to said end of the body about an axis parallel to the direction of blade reciprocation, said hook-like extensions

cooperating with the edges of the apertures to preclude edgewise displacement of the stationary cutting blade in the plane of said reciprocation; and means for yieldingly holding the cutting head against swinging motion to its disassembling position, said means comprising a keeper integral with one of said hinge elements and a spring detent carried by the other hinge element and engaged behind said keeper in the operative position of the cutting head.

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