Feb. 5, 1929. 1,701,148

A. J. DREMEL

ELECTRIC HAIR CLIPPER

Filed July 19, 1926 2 Sheets-Sheet 1

Fig. 1

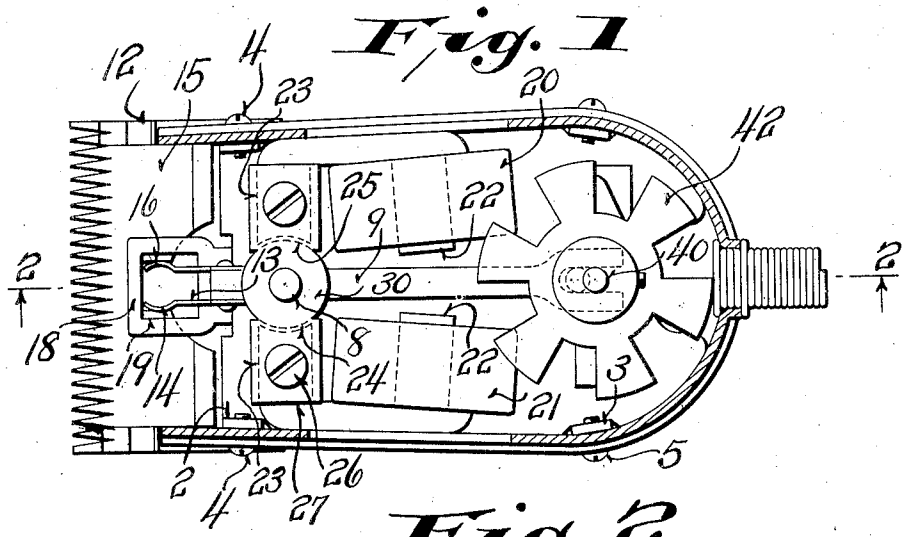


Fig. 2

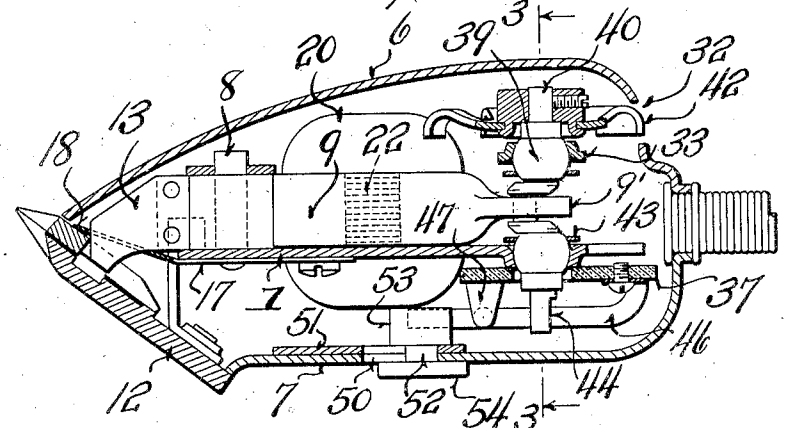
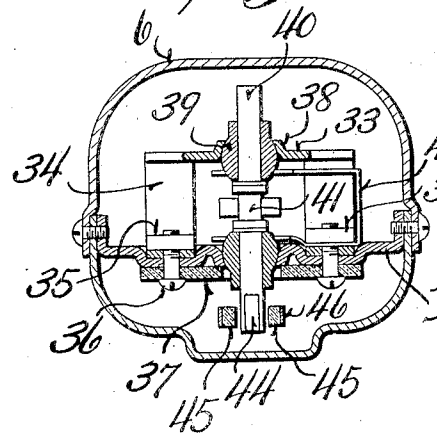


Fig. 3



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Filed July 19, 1926 2 Sheets-Sheet 2

Fig. 4

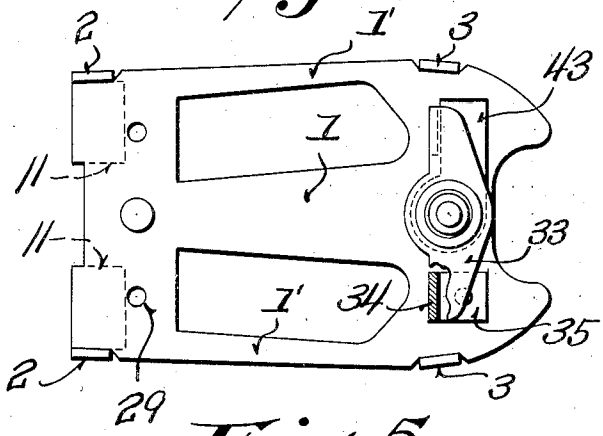


Fig. 5

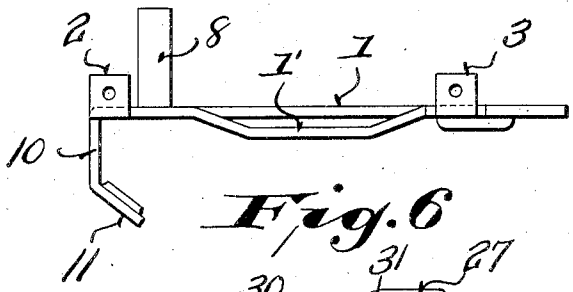


Fig. 6

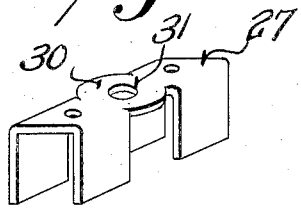
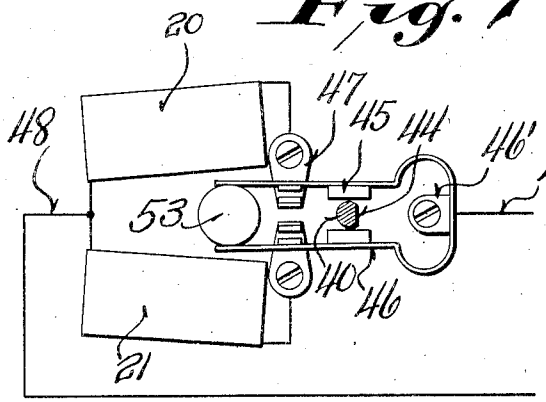


Fig. 7



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UNITED STATES PATENT OFFICE.

ALBERT J. DREMEL, OF RACINE, WISCONSIN.

ELECTRIC HAIR CLIPPER.

Application filed July 19, 1926. Serial No. 123,305.

This invention relates to electric hair clippers.

In general, this invention is an improvement over that disclosed in my prior Patent #1,541,334, of June 9, 1925, for electric hair clippers and has the same general objects as those set forth in such patent, such as the provision of an electric hair clipper which will run either upon A. C. or D. C., which is self-contained, which is of very small size, and which is self-ventilating.

Further objects are to provide a novel form of mounting in which a main supporting plate is employed and carries the electromagnets, the armature, the stationary clipper blade, and the bearings for the contacts, switch, and crank shaft, and in which the assembly of the parts upon this main supporting plate may be most easily made, and in which the utmost accessibility of the parts is provided, as the casings or housings are carried directly by said plate, and the plate may be removed from the casing as a unit and will carry all of the operative parts.

Further objects are to provide an electric hair clipper in which no die castings or other cast parts of this type are required, but instead, in which the casings and the parts thereof may be formed from stampings to secure the utmost cheapness of construction.

Further objects are to provide an electric hair clipper in which a resilient connection is provided between the armature and the movable clipper blade of such a nature that although the movable clipper blade may be held stationary, as by clogging, that nevertheless the armature will continue to execute complete vibrations, and in this way the clipper blade will receive slight motions and will thus be caused to work itself out of the hair which, as stated, may have temporarily clogged the blade. In other words, the construction is such that the machine goes on operating, although the movable blade may become clogged, due to forcing it into too great an amount of hair in a given time. In this way, therefore, a machine is provided which continues to function, and which will work itself out of any clogged condition.

It is to be understood that these clippers are subject to jars in the normal handling of the device, and, consequently, danger of misalignment of the parts with consequent binding frequently results. This invention is designed to provide a clipper which is so constructed that although the device may be subjected to relatively severe jars that nevertheless the bearings for the revoluble shaft or crank shaft or similar part are so formed that they will automatically align themselves, although their supports may have become shifted, and thus a self-aligning set of bearings for the shaft is provided which will prevent any binding whatsoever, even under extreme conditions. Further objects are to provide an electromagnetic clipper, in which the controlling contacts are readily accessible, and in which a novel form of cut-off switch or button is employed in connection with these contacts to move the contacts themselves out of operative position and to thus open the electric circuit of the device.

An embodiment of the invention is shown in the accompanying drawings in which:

Figure 1 is a plan view of the device with the casing shown in section;

Figure 2 is a vertical sectional view through the device, such view corresponding to a section on the line 2—2 of Figure 1;

Figure 3 is a sectional view on the line 3—3 of Figure 2;

Figure 4 is a plan view of the main supporting plate, a part of the construction being shown in section;

Figure 5 is a side elevation of the structure shown in Figure 4 with the upper bearing for the crank shaft omitted;

Figure 6 is a perspective view of the clip for the magnet ends or cores;

Figure 7 is a diagrammatic view showing the electric connections and the contacts.

The electric hair clipper is provided with a main supporting plate 1 of sheet metal stamped into the form shown in Figures 4 and 5. This sheet metal plate 1 is provided with upturned forward and rear lugs 2 and 3 which receive the attaching screws 4 and 5 of the upper and lower casing sections or members 6 and 7. These casing members are stamped from sheet metal and thus the expense of die casting or similar constructions is avoided.

Further, the main supporting plate 1 is provided with the pivot pin 8 for the vibrating armature 9, and with downwardly extending arms 10 equipped with a rearwardly slanting lugs 11 for the reception of fastening members for the stationary blade 12 so that the stationary blade is rigidly carried by the supporting plate 1.

The vibrating armature 9 is, as stated, pivotally carried by the pin 8 and is provided with a pair of forwardly extending elongated leaf springs or flat springs 13. These springs 13 have downwardly extending, rounded ends 14 which fit within a cutout formed in the movable blade 15, as most clearly shown in Figures 1 and 2, with the rounded portions 14 of the springs contacting with the faces 16 of the cutout in the movable blade. Further, the stationary plate carries a spring 17 which is provided with a rectangular arm 18 equipped with a cutout 19 through which the springs 13 project. This last mentioned spring 17 has its forward edge bearing upon the movable blade 15 and, consequently, applying the requisite yielding pressure to such blade to hold it in engagement with the stationary blade 12, such movable blade being guided in any usual or appropriate manner with reference to the stationary blade, so that it may reciprocate along such blade.

The electromagnets are provided with energizing coils 20 and 21. These coils are carried by the cores 22, which are preferably formed of laminations. These cores are U-shape and are provided with front portions 23. The faces of the rear cores are flat and lie in planes radiating radially from the axis of the pin 8, or in approximately these planes, so that they will present flat faces to the vibrating armature 9. The cores 23 or arms of the magnets are curved at their inner ends, as indicated at 24, to conform to the cylindrical portion 25 of the armature, so that the maximum area of flux path is provided. These magnets, it will be seen, are formed from similar stampings and are U-shape, and may be very cheaply produced. They are stacked and compressed in the form shown and are each held by means of a single screw 26. They are prevented from turning by means of the clip 27 which as may be seen from Figure 6 is provided with two channels to receive the ends 23 of the magnet cores. The screws 26 pass through the clip, through the magnet cores, and into the plate 1, such screws entering the threaded apertures 29 of the plate. Thus an extremely rigid mounting for the magnets is secured and a minimum of fastening members, such as screws are employed. The channeled portions of the clip 27 are joined by means of a circular or disc-like portion 30, which is apertured, as indicated at 31 in Figure 6, to receive the pivot pin 8 of the armature. Thus the upper end of the pin is also rigidly supported by means of the clip 27, so that the pin is held against loosening even when subjected to the continuous, rapid stresses imposed by the vibrating armature.

Preferably, the supporting plate 1 is provided with side arms 1', which are depressed, as indicated in Figure 6, such depressed portion furnishing additional room in the casing for the wires from the electromagnets. Further, by having the supporting plate cut out, as shown in Figure 4, ventilation may be readily secured, and the air may be drawn from the under side of the plate, through the plate against the magnet coils, and projecting through the opening 32 (see Figure 2) of the upper casing member 6.

Adjacent the rear end of the supporting plate 1, an upper support 33 is provided, and is equipped with downturned arms 34, as shown most clearly in Figure 3. These arms are provided with feet or lugs 35, which are apertured and threaded to receive the screws 36. The screws 36 also serve to hold the insulating contact carrying plate 37.

It is to be particularly noted that the support 33 and the plate 1 are each provided with socketed or spherically recessed portions 38 which receive the spherical bearings 39 for the crank shaft 40 (it being noted that the crank shaft 40 has the flywheel omitted in Figure 3 for the sake of clearness).

These spherical bearings are elongated to provide elongated bearings for the crank shaft 40. If the device is subjected to jars and the upper support 33 is shifted relative to the main supporting plate 1, no damage can result, as the spherical bearings insure their correct and free alignment to thus relieve the crank shaft of any binding whatsoever.

It is to be noted that the extreme outer end 9' of the armature is slotted and receives the crank 41 of the crank shaft and, consequently, as the armature vibrates the crank shaft is rotated.

The crank shaft is provided with a flywheel 42 (see Figures 1 and 2) which is in the nature of a fan, to throw the air outwardly through the aperture 32 in the upper casing. Further, this flywheel insures the continuous rotation of the armature and carries the crank past dead center. In addition to this, the flywheel 42, it will be noted from Figure 2, is closely adjacent the aperture 32 and, consequently, may be given an initial spin by the thumb or finger of the operator in starting the device.

In connection with the spherical bearings 39, it is to be noted from Figure 3, that a very simple means has been provided for holding them in place. This means consists of a U-shaped spring 43 whose upper and lower arms are apertured and hold the bearings in their correct positions within their sockets. This spring may be held in place by one of the screws 36, such spring being clamped beneath a foot 35 of the upper support.

The lower end of the crank shaft 40 is

provided with a flat face 44, as shown most clearly in Figures 2 and 7. This lower end is located between insulating blocks 45 carried by the arms 46 of a U-shaped spring member. This U-shaped spring member is in reality the movable portion of the contact making device. It is provided with an ear 46', whereby it may be attached to the insulating plate 37. A pair of stationary contact members 47 are secured to the insulating plate, and the cooperating parts of the movable arms 47 and such stationary contacts are equipped with suitable non-corrosive contact faces. The stationary contacts 47 are connected to the coils 20 and 21 of the electromagnets. The other ends of the coils are connected together and to a return conductor 48. One conductor is also connected to the U-shaped contact member and is indicated by the reference character 49 in Figure 7. It is to be noted that the conductors have been omitted from Figures 1, 2, and 3 for the sake of clearness.

In the normal operation of the device, the flat face 44 of the crank shaft 40 allows first one and then the other of the movable contacts to engage its corresponding stationary contact and, consequently, permits energization of the appropriate electromagnet. This draws the armature towards that electromagnet and gives a turn or twist to the crank shaft. Continued rotation causes the cylindrical portion of the lower end of the crank shaft to open the circuit for the previously energized electromagnet. The flat face 44 of the armature shaft 40 is then presented towards the other spring arm 46 and, consequently, permits the opposite electromagnet to become energized. This operation continues in rapid succession with consequent vibration of the armature, spinning of the crank shaft, and reciprocation of the movable cutter blade.

Novel means have been provided for opening the circuit of the device when desired. This is accomplished by providing a slot 50 in the bottom casing and through a reenforcing strip 51 carried by such casing, if desired. A pin 52 passes through this slot, as shown in Figure 2, and is provided with an insulating upper cylindrical member 53 adapted to enter between the extended arms of the spring fingers 46, to separate such arms and hold them permanently out of engagement with the stationary contacts, as shown in Figures 2 and 7. The lower end of the pin 52 is equipped with a thumb piece 54 on the under side of the device, so that the insulating block 53 may be slid either between the spring fingers or outwardly therefrom.

Thus, the necessity of a distinct and separate switch is avoided and the make and break mechanism for the device itself constitutes the controlling switch for the apparatus.

It is to be particularly noted that applicant has made an electric hair clipper which is of extreme compactness, and may be readily carried in the hand of the operator, and may be most easily manipulated.

Further, it will be seen that the device is of very light weight, which further facilitates the easy operation of the device in the actual cutting of the hair.

It is to be noted further that the device may be made in a very inexpensive manner, as no die casted or complicated parts are required, but instead in which stampings are employed. As is well known in the manufacture of these devices, such construction permits the utmost cheapness of manufacture.

It is to be noted further that a remarkable ease of assembly is permitted by this device, as the entire operative unit may be assembled at a single time upon the supporting main plate, and that thereafter it is a very simple matter to slip the shells into place and secure them to the lugs of the main supporting plate.

Further, the main supporting plate directly carries the stationary cutter blade and, consequently, the exact relative position of these parts is assured.

Although the invention has been described in considerable detail, such description is intended as illustrative rather than limiting as the invention may be variously embodied and as the scope of such invention is to be determined as claimed.

I claim:

1. An electric hair clipper comprising an electromagnet, a vibratory member actuated thereby, a pair of clipper blades, one of said blades being movable with reference to the other, and easily deformed resilient means interposed between said vibratory member and the relatively movable clipper blade, said resilient means being relatively extended as compared with the stroke of said relatively movable clipper blade, whereby said vibratory member maintains its vibratory motion when said clipper is clogged.

2. An electric hair clipper, comprising a pair of electromagnets, an armature mounted between said electromagnets, a crank shaft operated by said armature, contacts operated by said crank shaft and controlling said electromagnets, a stationary clipper blade, a movable clipper blade associated therewith, and resilient means connecting said armature and said movable clipper blade and permitting said armature to actuate said crank shaft throughout complete strokes when said movable clipper blade is temporarily held stationary.

3. An electric hair clipper, comprising a

pair of electromagnets, an armature adapted to vibrate between said magnets, a crank shaft actuated from said armature, an upper and a lower frame member having sockets formed therein, spherical bearings for said crank shaft seated within said sockets, a stationary clipper blade, a movable clipper blade actuated from said armature, and contacts controlled by said crank shaft for controlling said electromagnets.

4. An electromagnetic clipper, comprising a supporting plate having a downturned foot, a stationary clipper blade carried by said foot, an electromagnet, and a vibratory armature carried by said plate, a movable clipper blade operatively connected to said armature, an upper and a lower shell for enclosing said electromagnet and armature and said plate, and securing means for attaching said shells to said plate.

5. An electromagnetic hair clipper, comprising a supporting plate, a pair of electromagnets having U-shaped cores, a vibratory armature mounted between said cores, a bearing member for said armature enclosing opposite ends of said cores, securing means passing through said bearing members, said cores and said plate, a stationary clipper blade carried by said plate, a movable clipper blade operatively coupled to said armature, and an enclosing shell secured to said plate.

6. An electric hair clipper comprising an electromagnet, a movable member actuated thereby, a stationary clipper blade, a supporting plate carrying said electromagnet, said movable member and said stationary clipper blade, a movable clipper blade cooperating with said stationary blade and actuated by said member, and an upper and a lower enclosing shell secured to said plate, said shells being bodily removable from said plate to completely expose said electromagnet, said movable member and said clipper blades.

In testimony that I claim the foregoing I have hereunto set my hand at Milwaukee, in the county of Milwaukee and State of Wisconsin.

ALBERT J. DREMEL.