June 15, 1937. H. S. SIZER 2,083,620

HAIR CLIPPER

Filed Sept. 28, 1934

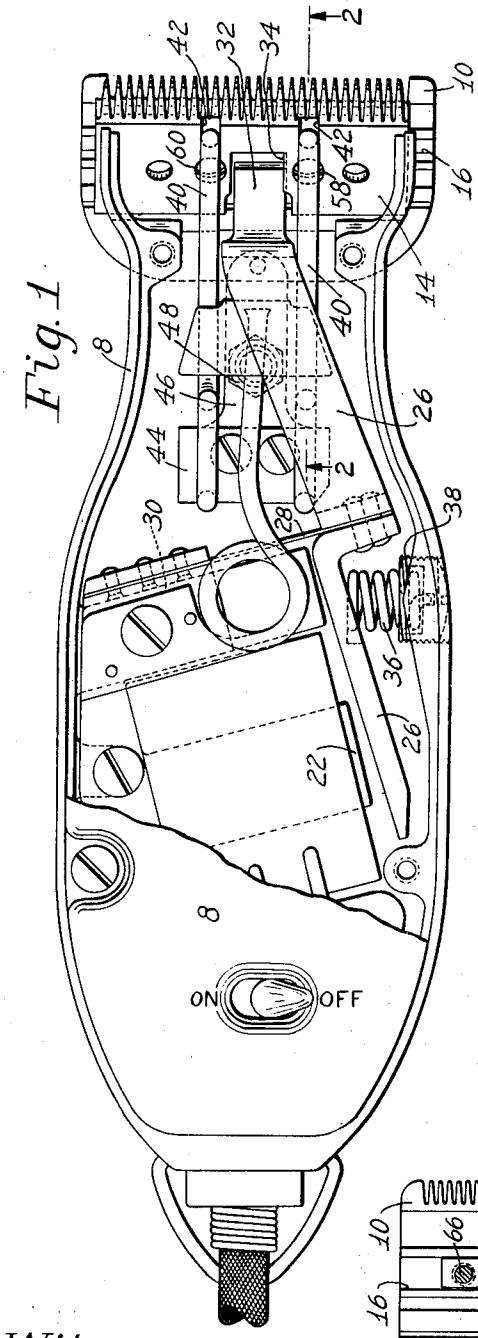


Fig. 1

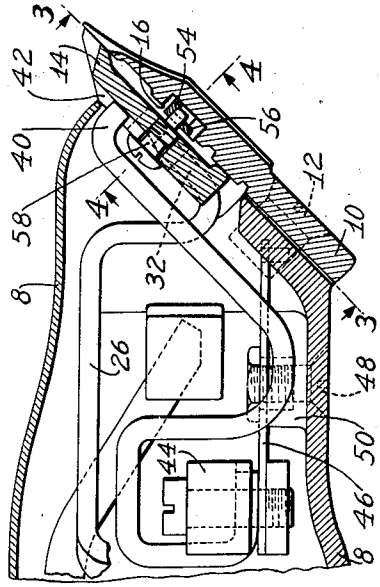


Fig. 2

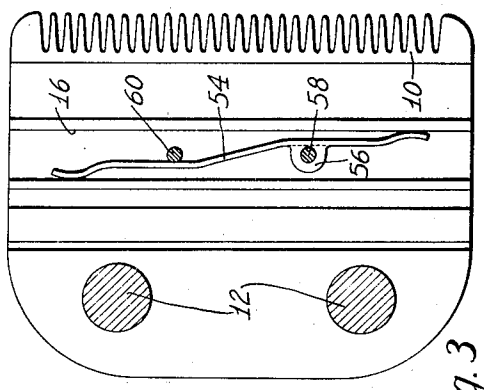


Fig. 3

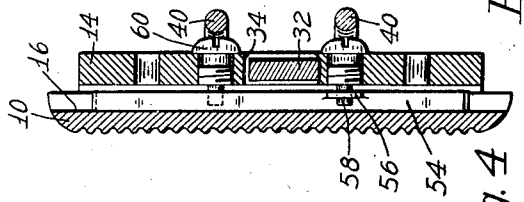


Fig. 4

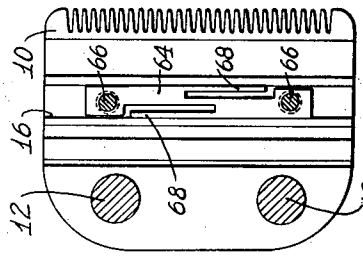


Fig. 5

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2,083,620

HAIR CLIPPER

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10 Claims. (Cl. 30—1)

The present invention relates to hair clippers.

The invention is intended primarily as an improvement in an electromagnetic vibratory clipper of the general type illustrated in the patent to Miner, No. 1,895,292, dated January 24, 1933, comprising a stationary blade and a movable blade keyed to slide therein, and a driving mechanism including an electromagnet and armature for moving the blade in one direction and a return spring system engaging the blade and tending normally to hold the blade at the limit of its movement in the opposite direction. With this general construction and arrangement of the parts, which includes a cooperating guide and slot connection between the two blades, for reciprocating the movable blade in a single path, it has been found that there is a tendency for the cooperating bearing surfaces of the blades to become oxidized and to rough up after relatively little use at the extremely high speed of reciprocation employed, so that the operation of the clipper soon becomes faulty or is entirely stopped. In the construction set forth in the above patent, this difficulty was avoided by the use of a special steel which, however, entails considerable additional expense both for the material and in the cost of machining the same.

It is a principal object of the present invention to provide in a clipper of this general description, means for varying the path followed by the reciprocating blade with relation to the supporting stationary blade to prevent scoring and subsequent oxidation of the cooperating bearing surfaces, and thus to permit the use of a cheaper and more easily machined metal in the manufacture of the blades.

It is a further object of the invention to provide a novel and improved guide and slot connection between the stationary and movable blades, together with an electromagnetic driving mechanism therefor which will permit a controlled variation in the reciprocatory path followed by the movable blade, and will at the same time insure a noiseless and efficient operation of the clipper.

With these and other objects in view, as may hereinafter appear, the several features of the invention consist in the devices, combinations and arrangement of parts hereinafter described and claimed, which together with the advantages to be obtained thereby will be readily understood by one skilled in the art from the following description taken in connection with the accompanying drawing, in which Fig. 1 is a plan view of the clipper with a portion of the casing broken away to illustrate underlying parts; Fig. 2 is a detail sectional view taken on the line 2—2 of Fig. 1 to illustrate the slot and key connection between the blades and a portion of the driving connections therefor; Fig. 3 is a detail sectional view taken on the line 3—3 of Fig. 2 illustrating particularly the guide slot in the stationary blade and the resilient key member mounted on the movable blade engaging in the slot; Fig. 4 is a detail sectional view taken on the line 4—4 of Fig. 2; and Fig. 5 is a detail view similar to Fig. 3 illustrating another form of a resilient key and slot connection between the two blades.

The hair clipper disclosed in the drawing as embodying in a preferred form the several features of the present invention, comprises a casing 8 which houses the operating parts of the clipper and also forms a handle which may be conveniently grasped by the hand of the operator. At the forward end of the casing a fixed cutter blade 10 is secured by means of the clamping screws 12. Cooperating with the fixed blade 10 is a movable blade 14 which is arranged to move laterally of the fixed blade, being guided relatively thereto by means of a guide and slot connection comprising a slot or groove 16 formed in the upper face of the fixed blade 10 and a cooperating guide which is secured to the under side of the movable blade 14. The guide illustrated in the drawings constitutes an embodiment in a preferred form of certain features of the present invention and will be hereinafter more fully described.

The power for operating the clipper is supplied by means of an electromagnet 22 to which driving impulses are imparted at a rapid frequency by an alternating electric current to secure a rapid vibratory movement of an armature 26 which is arranged to oscillate the movable blade 14. The armature is mounted intermediate its length for oscillatory movements, on a flat spring 28 which is rigidly secured to the frame 30 of the clipper. At its forward end the armature is provided with a tongue 32 which is arranged to bear against one side of a slot 34 formed in the movable clipper blade 14, and at its rear end is arranged to overlie poles of the magnet 22. A compression spring 36 seated in a recess formed in an adjustably mounted plug 38 screw-threaded into the clipper casing 8, is arranged to bear against the rearwardly extending arm of the armature 26, and tends normally to swing the rear end of the armature toward the poles of the electromagnet 22.

With the construction herein disclosed there is also provided a unitary return and tensioning spring system for the upper blade which comprises two return spring members 40 which engage at their forward ends with corresponding slots 42 formed in the movable blade 14, and at their rear ends are rigidly secured in a plug 44. The springs 40 are tensioned in such a manner as to exert a yielding strain on the movable blade 14 in a direction opposite to that exerted by the armature 26 under the force of the electromagnet

22. The plug 44 is in turn supported on the free end of a flat spring member 46 which is rigidly secured by means of a screw bolt 48 to a lug 50 formed in the casing, and serves to force the springs 40 yieldingly in a downward direction to provide the proper tensioning force between the bearing surfaces of the two blades.

The construction and arrangement of the parts so far described are the same as in the clipper illustrated in the patent to Miner above referred to. As in the construction disclosed in the patent, the tongue 32 of the armature and the return springs 40 of the present construction are arranged to exert a twisting strain on the movable blade, so that one portion of the guide member, which is mounted on the movable blade and engages the slot in the fixed blade, is pressed against one side of the slot and another portion of the guide member is pressed against the other side of the slot. In the construction disclosed in the patent, the guide member comprised two rigid guide blocks which caused the movable blade to have an absolutely straight line movement with relation to the fixed blade. With this construction, as has been stated, it was found that the bearing surfaces of the cooperating blades tended to oxidize and become roughed up to such an extent as to seriously interfere with or entirely stop the operation of the clipper, which difficulty was only overcome by the use of a special grade of steel which is comparatively expensive and extremely difficult to machine.

In carrying out the present invention, a novel and improved guide member has been provided which is arranged to cooperate with the clipper driving connections described, to vary the reciprocatory path followed by the movable blade, so that different portions of the engaging surfaces of the two blades are continuously being brought into engagement with each other. The variation in the reciprocatory movement of the two blades thus introduced, act effectively to prevent grooving and consequent oxidation of the engaging surfaces, and permits the use of cooperating clipper blades constructed in the usual manner and from materials normally used for instance, in the manufacture of relatively slow speed hand or power driven clippers. As best shown in Figs. 2, 3 and 4 of the drawing, the improved guide herein disclosed comprises a resilient spring guide member 54 which has formed thereon a lug 56 journalled to receive a pin 58 secured to the under side of the movable blade 14, and is provided at each end with bearing surfaces arranged to bear against the opposite sides of the guide slot or groove 16 formed in the stationary blade 10. A second pin 60 secured to the under side of the movable blade 14 projects into engagement with the spring member 54 to maintain the spring in operative position in engagement with the walls of the slot 16. With the construction and arrangement of the parts illustrated, it will readily be seen that the engagement of the return springs 40 with the slots 42 formed in the outer portion of the movable blade 14, tends to exert a twisting strain on the movable blade in a counterclockwise direction as illustrated in Figs. 1 and 3, to maintain the bearing portions of the spring guide member 54 at all times in engagement with the adjacent portions of the guide slot 16. The engagement of the tongue 32 of the armature with the abutment 34 formed on the inner or rear portion of the movable blade 14, similarly acts to exert a tensioning strain in a counterclockwise direction as illustrated in Figs. 1 and 3, on the movable blade 14. It will be evident from an inspection of the parts, that the amount of the twisting strain will vary during each reciprocation as the force of the armature is applied or released to impart a reciprocatory movement to the movable blade 14, and as the blade 14 is moved with or counter to the direction of the force applied by the return springs 40, so that a substantially figure 8 movement will be followed by the movable blade during the reciprocation. The amount of this movement may be readily controlled by the strength of the spring guide member 54 to secure the requisite amount of movement of the blade 14 transversely of the direction of reciprocation to prevent scoring and subsequent oxidation of the bearing surfaces without at the same time interfering with the reciprocatory cutting action of the blade with relation to the stationary blade 10.

A modified form of resilient spring guide for imparting a controlled variation to the reciprocatory path followed by the movable blade 14, is illustrated in Fig. 5. As illustrated in this figure, a block 64 is provided to slide in the guide slot 16 of the stationary blade 10, being rigidly secured by means of pins 66 to the movable blade 14. The block 64 is arranged to fit loosely in the guide slot 16, and is cut away to provide two spring bearing members 68 which engage yieldingly with the opposite sides of the guide slot 16. With this construction and arrangement of the guide and slot connection between the two blades, a limited variation in the reciprocatory path followed by the movable blade is permitted which is limited by the engagement of the opposite sides of the block 64 with adjacent sides of the guide slot 16 as the twisting strain on the movable blade 14 is varied by the alternating thrust and retracting movements of the armature 26.

It is to be understood that the several features of the present invention, while particularly applicable to a hair clipper having the general construction and arrangement of parts herein disclosed and more fully set forth in the patent to Miner above referrred to, may be equally well applied to clippers of other descriptions in which the movable blade is actuated by the operation of a reciprocating member engaging therewith, and is guided with relation to a cooperating blade by means of a guide and slot connection.

The invention having been described, what is claimed is:

1. In a clipper, the combination with a casing, of a stationary clipper blade carried by the casing, a movable clipper blade cooperating with the stationary blade, means for reciprocating said movable blade and for exerting a twisting strain on said blade with relation to the stationary blade at all times in one direction, and a guiding connection for determining the path of movement of the movable blade with relation to the stationary blade comprising a resilient guide supported on one of said blades to engage a slotted portion of the other of said blades for yieldingly positioning said movable blade against said twisting strain to permit a controlled variation in the reciprocatory path followed by the movable blade.

2. In a clipper, the combination with a casing, of a stationary clipper blade carried by the casing, a movable clipper blade cooperating with the stationary blade, a constantly actuated reciprocatory member engaging the movable blade to drive the same in one direction, a return spring engaging the movable blade tending to maintain the blade at the limit of its movement in an oppo-

site direction, the parts being arranged to cause the opposed forces on the actuating member and return spring to exert a twisting strain on the movable blade with relation to the stationary blade at all times in one direction, and a guiding connection for determining the path of movement of the movable blade with relation to the stationary blade comprising a resilient guide supported on one of said blades to engage a slotted portion of the other of said blades for yieldingly positioning said movable blade against said twisting strain to permit a controlled variation in the reciprocatory path followed by the movable blade.

3. In a clipper, the combination with a casing, of a stationary clipper blade carried by the casing, a movable clipper blade cooperating with the stationary blade, an electromagnet, an armature driven thereby connected to drive the movable blade in one direction, a return spring engaging the movable blade, the parts being arranged to cause the opposed forces of the armature and return spring to exert a twisting strain on the movable blade with relation to the stationary blade at all times in one direction, and a guiding connection for determining the path of movement of the movable blade with relation to the stationary blade comprising a resilient guide on one of said blades to engage a slotted portion of the other of said blades for yieldingly positioning said movable blade against said twisting strain to permit a controlled variation in the reciprocatory path followed by the movable blade.

4. In a clipper, the combination with a casing, of a stationary clipper blade carried by the casing, a movable clipper blade cooperating with the stationary blade, an electromagnet, an armature driven thereby connected to drive the movable blade in one direction, a return spring engaging the movable blade tending to maintain said blade at the limit of its movement in an opposite direction, the parts being arranged to cause the opposed forces of the armature and return spring to exert a twisting strain on the movable blade with relation to the stationary blade at all times in one direction, and a guiding connection for determining the path of movement of the movable blade with relation to the stationary blade comprising a resilient guiding member supported on one of said blades to engage a slotted portion of the other of said blades to yieldingly position said movable blade against the twisting strain to permit a controlled variation in the reciprocatory path followed by the movable blade.

5. In a clipper, the combination with a casing, of a stationary clipper blade carried by the casing, a movable clipper blade cooperating with the stationary blade, one of said blades having formed therein a guiding slot, a spring member secured to the other of said blades arranged to bear at one end against one side of the slot and at its other end against the other side of said slot, driving connections for said movable blade comprising an electromagnet and an armature driven thereby connected to move the blade in one direction and to exert a twisting strain thereon, and a return spring engaging the movable blade and tending to exert a twisting strain on the movable blade in the same direction as said first mentioned twisting strain.

6. In a clipper, the combination with a casing, of a stationary clipper blade carried by the casing, a movable clipper blade cooperating with the stationary blade, one of said blades having formed therein a guiding slot, a spring member secured to the other of said blades arranged to bear at one end against one side of the slot and at its other end against the other side of said slot, driving connections for said movable blade comprising an electromagnet and an armature driven thereby for moving said blade in one direction and engaging said blade at a point to exert a twisting strain on the movable blade with relation to the stationary blade to maintain the bearing portions of said spring in engagement with the corresponding portions of the slot, and a return spring tending to maintain the blade at the limit of its movement in an opposite direction and engaging said movable blade at a point to exert a twisting strain on the movable blade in the same direction as said first mentioned twisting strain.

7. In a clipper, the combination with a casing, of a stationary clipper blade carried by the casing, a movable clipper blade cooperating with the stationary blade, one of said blades having formed therein a guiding slot, a guide block secured to the other of said blades arranged to fit loosely in said slot and having formed on opposite sides and adjacent opposite ends thereof resilient portions to engage opposite sides of the slot, driving connections for said movable blade comprising an electromagnet and an armature driven thereby connected to move the blade in one direction and to exert a twisting strain thereon to engage said spring portions against the adjacent walls of the slot, and a return spring engaging the movable blade tending to maintain the blade at the limit of its movement in the opposite direction and tending to exert a twisting strain on the movable blade in the same direction as said first mentioned twisting strain.

8. In a clipper, the combination with a casing, of a stationary clipper blade carried by the casing, a movable clipper blade cooperating with the stationary blade, one of said blades having formed therein a guiding slot, a resilient guide member secured to the other of said blades arranged to permit a limited twisting movement of one of said blades with relation to the other, driving connections for said movable blade comprising a constantly actuated reciprocatory member engaging the movable blade to drive the same, and a spring engaging the movable blade arranged to exert a twisting strain on the movable blade with relation to the stationary blade at all times in one direction against the action of said resilient guide member to permit a controlled variation in the reciprocatory path followed by the movable blade.

9. In a hair clipper, the combination with a stationary clipper blade, of a movable clipper blade, means for reciprocating said movable blade, and a resilient guiding connection between the movable and stationary blades acted upon by the means for reciprocating the movable blade to produce a slight variation in the movement of the movable blade laterally of the path of reciprocation.

10. In a hair clipper, the combination with a stationary clipper blade, of a movable clipper blade, a reciprocating member engaging the movable blade to reciprocate the same, and a resilient guiding connection between the movable and stationary blades acted upon by said reciprocating member to produce a slight variation in the movement of the movable blade laterally of the path of reciprocation.

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