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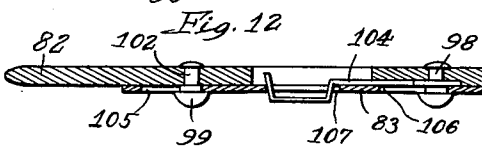
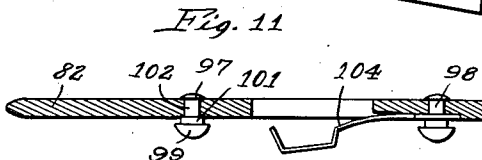
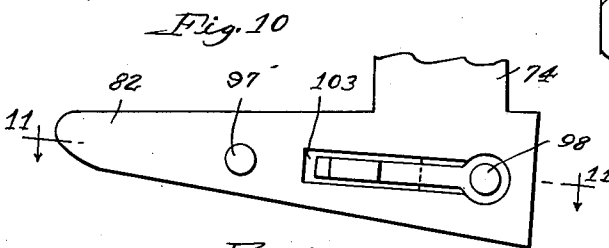
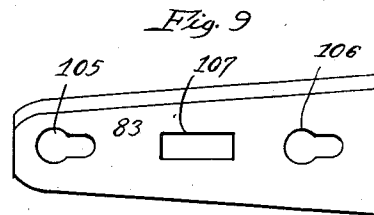
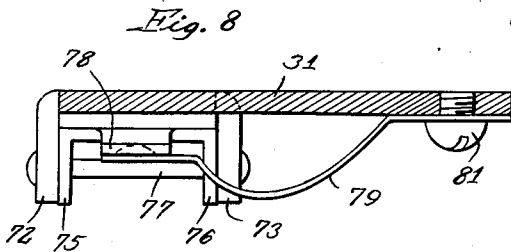
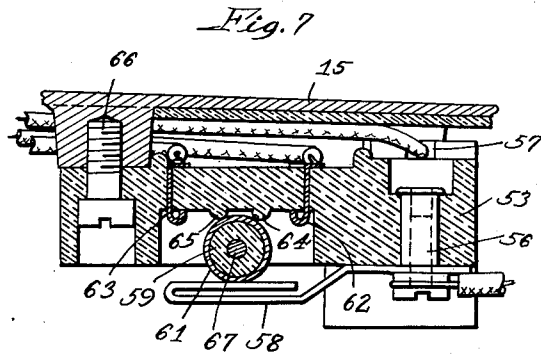
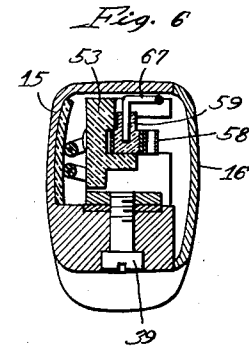
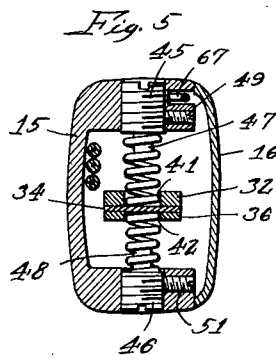
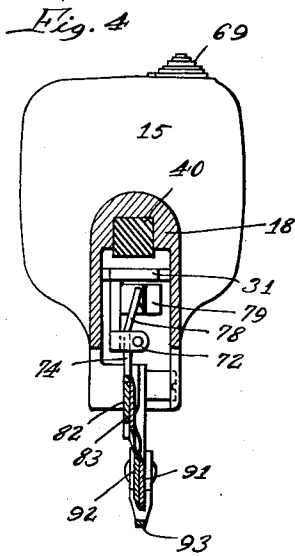
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1,996,813

ELECTRIC SCISSORS

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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ELECTRIC SCISSORS

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Application October 24, 1932, Serial No. 639,288

11 Claims. (Cl. 30—13)

This invention relates to scissors and has special reference to scissors of the type wherein the blades are electrically driven.

I have aimed to provide electric scissors wherein a driving mechanism is housed within a casing which is so shaped as to provide a handle for the manipulation of the scissors and so arranged that the scissors blades are positioned at the lower side of the casing near the front end thereof, and wherein a control element is positioned for manipulation by the thumb so that the operation of the scissors may be controlled with convenience and dispatch.

A further object of the invention is the provision of electric scissors wherein improved tuning means is provided for tuning the oscillation of the vibrating armature.

I have also aimed to provide electric scissors wherein means are provided for preventing the armature from striking the electromagnet should the armature overrun.

A still further object of the invention is the provision of electric scissors wherein one of the cutting blades is pivotally supported for movement toward and away from its companion blade, and means are provided for exerting a cutting tension between the two blades so as to provide a yielding, cutting pressure therebetween and to permit the convenient exchange of blades.

Another object of the invention is the provision of improved means for altering the area of contact between the cutting blades so as to prolong the life thereof.

I have also aimed to provide electric scissors having means for removably supporting the cutting blades for the replacement thereof and the provision of cutting blades of improved characteristics which may be replaced when dulled.

Other objects and attendant advantages will be apparent from the following description and the accompanying drawings, in which—

Figure 1 is a side elevation of my improved electric scissors;

Fig. 2 is a top view;

Fig. 3 is a side view, partly in section with the casing cover removed, showing in dotted lines the manner in which the lower blade holder may be moved;

Fig. 4 is a section on the line 4—4 of Fig. 3;

Fig. 5 is a section on the line 5—5 of Fig. 3 showing the tuning springs;

Fig. 6 is a section on the line 6—6 of Fig. 3;

Fig. 7 is a section on the line 7—7 of Fig. 3;

Fig. 8 is a section on the line 8—8 of Fig. 3;

Fig. 9 is a side view of one of the blades;

Fig. 10 is a fragmentary side view of the upper blade holder;

Fig. 11 is a section on the line 11—11 of Fig. 10 with the blade removed, and

Fig. 12 is a section on the line 11—11 of Fig. 10 with the blade positioned on the holder.

In a general way, the invention contemplates the provision of a casing which is shaped and adapted for use as a handle to manipulate the scissors. Within the casing is supported an electromagnet supplied with alternating current through a pair of leads passing into the casing and adapted to be plugged into a suitable electric receptacle. A vibrating armature is supported at one end upon the casing in a suitable resilient manner and is tuned by means of coiled compression springs acting against opposite sides of the armature. The opposite end of the armature carries a cutting element which extends through an opening on the lower side of the casing. A second cutting element is mounted directly on the casing and cooperates with the first mentioned cutting element to execute a cutting action simulating that of conventional scissors. One phase of the invention deals with the provision of replaceable scissors blades and with the holders for supporting these blades in desired position.

Referring first to Figures 1—3, inclusive, a hollow casing is formed by a body portion 15 and a cover portion 16, the cover portion being fastened on one side of the body portion by means of screws 17 or otherwise as convenient. The front end of the casing is provided with a bulge or boss 18 arranged to provide an extension of the chamber within the casing, as best shown in Fig. 3. The lower side of the casing is provided with a projection 19 at the rear end thereof for the purpose of preventing the hand of the operator from slipping off the casing. Toward the front end of the casing an opening 21 is provided which extends from a point forward of the transverse center line of the casing to the front end thereof, the opening serving to permit the passage of the blade-holding mechanism presently to be described.

An electromagnet designated generally by the numeral 22 is positioned within the casing near the front end thereof through screws 23 or other suitable fastening mechanism and consists of a core 24, preferably laminated, and a coil 25. In this instance, the laminated core is provided with three pole pieces 26, 27 and 28, the pole piece 27 extending through the center of the coil and the pole pieces 26 and 28 being spaced on

opposite sides thereof. A vibrating armature 29 consists of a portion 31 extending along the ends of the pole pieces 26 and 27 having its free end extending into the interior of the boss 18. A second portion 32 is positioned opposite the pole piece 28 and is connected with a portion 31 by means of a portion 33. The armature portion 32 is riveted to a flat strip spring 34 by means of rivets 35 which also serve to secure a plate 36 to the opposite side of the spring 34. The free end of the spring 34 is affixed to a boss 37 on the inner side of the casing by means of a plate 38 and screw 39, the plate and screw serving merely to hold the spring firmly against the boss. A resilient bumper member 40 which may be of rubber, as in the present construction, is positioned in the boss 18 so that should the amplitude of the armature become excessive and overrun, it will strike the bumper before striking the magnet. The armature portion 32 and the plate 36 which are fastened to opposite sides of the spring 34 are provided with sockets 41 and 42 to receive the ends of coiled tuning springs 43 and 44. The opposite ends of the tuning springs bear against screws 45 and 46 threaded into the top and bottom, respectively, of the casing, the screws being provided with pins 47 and 48, best shown in Fig. 5, to hold the springs in the upright position. The diameter of the screws 45 and 46 is greater than that of the springs so that the springs may be inserted through the screw openings in the casing to assemble the machine. Screws 49 and 51 positioned wholly within the casing serve to lock the screws 45 and 46 against movement when they are once properly positioned to develop the required tension on the tuning springs.

Thus, when current passes through the electromagnet 22, the armature 29 is alternately drawn toward the magnet and forced away from the magnet by the changes in polarity of the latter, the armature being of a metal having suitable magnetic properties, such for example, as iron or steel. The armature thus vibrates toward and away from the magnet on the spring 34. The coil springs 43 and 44 serve to dampen the normal movement of the armature. Through the screws 45 and 46 suitable pressure is placed on the dampening springs 43 and 44 to cause the armature to vibrate smoothly. The screws 45 and 51 are employed for locking the adjusting screws 49 and 46 once suitable pressure has been applied to the tuning springs so that the pressure cannot be altered without first removing the cover of the casing.

In order to compensate for different line voltages, the coil 25 is tapped so that different amounts of the coil may be used depending upon the line voltage. The three leads from the coil are connected to a switch element designated generally by the numeral 52, substantially at the rear end of the casing. This switch element is best shown in Fig. 7 and consists of an insulating plate 53 to which the leads 54 and 55 are connected through binding posts 56 and 57. One of the leads from the coil is connected directly to the binding post 57. A spring contact member 58 is connected to the binding post 56 and extends outward to contact a switch roller 59 having a layer 61 of conductive material on its outer surface. The tap lead and one of the other leads from the coil are connected to contact elements 62 and 63 of the switch in spaced relation so that when the roller 59 is moved to one position it will cause contact to be made between the con-

tact element 63 and the spring contact member 58 and when moved into contact in the opposite direction contact will be made between the contact element 62 and the spring contact member 58. Projections 64 and 65 provide an intermediate position for the roller in which no contact is made. The insulating plate 53 is fastened to the interior of the case by means of screws 66. A rod 67 has one end received in the roller 59 and extends forward in the casing to a point beneath an opening 68 in the upper side thereof, at which point a button 69 is affixed thereto, the button resting on the outer surface of the casing. Thus, movement of the button forwardly or rearwardly serves to throw the switch between its various positions to control the operation of the electrical mechanism.

A bracket 71 is secured to the lower side of the armature portion 31 and is provided at its lower end with a pair of ears 72 and 73. An upper blade holder 74 having ears 75 and 76 is secured to the ears 72 and 73 by means of a pin 77 extending through the ears 72 and 75 and the ears 73 and 76, respectively, to pivotally support the blade holder upon the bracket. The blade holder 74 is provided with an upwardly extending finger 78 against which a spring 79 affixed to the bracket 71 by means of a screw 81 is arranged to bear, the spring serving to rotate the blade holder about the pivot pin 71 to maintain it in suitable operative position, as will presently appear, but to permit the blade holder to be moved away from this position for a purpose presently to be described. The blade holder 74 extends forward to provide a blade supporting portion 82 for the purpose of supporting a replaceable upper blade 83.

A lower blade holder 84 is secured to the body portion 15 of the casing by means of a screw 85, the blade holder being provided with a slot 86 for the reception of the screw, which bears against the surface of the blade holder and holds it against the casing through frictional contact. A pin 87 on the casing passes through a circular opening in the blade holder, and a pin 88 passes through an elongated opening 89 in the blade holder to further position the blade holder with respect to the casing in a manner presently to be described. The forward end of the blade holder 84 is provided with a blade supporting portion 91 arranged to support a replaceable blade 92 similar in all respects to the blade 83. In order to prevent the vibration of the scissors from being communicated to a table or other support upon which cloth or the like is being cut, a spring shock absorber element 93 is affixed to the lower blade holder by means of a rivet 94 passing through one end of the spring element, the forward end of the element being free, as shown at 95. The blade holder is notched, as shown at 96, to normally receive the free end of the shock absorbing element so that cloth or other material being cut will not pass between these two elements and thereby interfere with the cutting operations.

It will be seen that the lower blade holder 84 is normally stationary while movement is imparted to the upper blade holder 74 through the armature 29, this movement being an oscillation of relatively short amplitude. The tongue 78 of the upper blade holder and the spring 79 on the bracket 71 serve to rotate the upper blade holder to bring the blade 83 into contact with the blade 92 and maintain a yielding cutting pressure between these two blades. A further object of this piv-

otal mounting and spring is to permit the upper blade holder to be swung laterally outward so that the blades 83 and 92 may be removed from the blade holders without disassembling the machine. As previously mentioned, the movement of the upper blade holder will consist of an oscillation of relatively small amplitude so that the cutting edges of the blades will move across each other through only a relatively small portion of their length. This is best shown in Figure 1 wherein the dotted line positions of the upper blade show the normal extremities of movement. In order to shift the area of contact of the blade edges, the lower blade holder 84 is made so that the angle thereof may be shifted, as best shown in Fig. 3. This is accomplished by making the opening 89 of substantially greater length than width so that the blade holder may be shifted or rotated about the pin 87. The two extreme positions are shown by the full line and dotted line positions of the blade holder in Fig. 3. In this way, the area of contact between the edges of the blades is shifted to prolong the life of the blades.

capable of easy and convenient hand manipulation and one wherein the blades are conveniently placed for visibility and efficiency and wherein the control mechanism is so arranged that the operation of the scissors is completely and instantly under the control of the operator. The blades are so mounted that the area of contact between the blades may be conveniently and rapidly altered without disassembling the device. The construction is such that the blades are maintained in contact with a uniform yielding cutting pressure.

I have also provided a new and improved construction wherein the blades may be conveniently removed from the blade holders without disassembling the mechanism, for the rapid replacement of the blades. I have also provided a new and improved blade construction which materially increases the length of life of the blades and decreases the cost of operation of the scissors. Another advantage of my construction lies in the fact that I have provided improved means for preventing the armature from striking the magnet should the device tend to overrun. A further feature of the invention consists of shock or vibration absorbing means, whereby the vibration of the scissors is not transmitted to tables or other supports upon which the fabric or material being cut is supported.

While I have thus described and illustrated a specific embodiment of my invention, I am aware that numerous alterations and changes may be made therein without materially departing from the spirit of the invention or the scope of the appended claims, in which—

I claim:

1. An electric scissors comprising an electromagnet, a vibrating armature in the field of said magnet, resilient means for supporting one end of the armature, a working tool secured to the opposite end of the armature for reciprocation, a pair of coiled compression springs acting against opposite sides of the armature to dampen the movement thereof, a stationary tool positioned to cooperate with the first mentioned tool, and a bumper of resilient material positioned to stop the movement of the armature at a point short of contact with the magnet to prevent the armature from striking the magnet upon excessive movement of the armature.

2. In an electric scissors having a vibrating armature and a stationary scissors blade, a movable scissors blade pivotally supported on said armature to rotate toward and away from said stationary blade, and spring means for maintaining the movable blade against the stationary blade with yielding cutting pressure.

3. An electric scissors comprising a casing shaped to provide a hollow handle, a movable scissors blade projecting from said handle and movable as a body with respect thereto, means within the handle for reciprocating said scissors blade, through a small amplitude said means being the sole support for said movable blade, a stationary scissors blade positioned in operative relationship with said movable blade, and means for releasably securing said stationary blade on said handle in any of a plurality of positions to vary the cutting area between the stationary and the movable blade, said last mentioned means being releasable for the removal of the stationary blade from the handle and from its operative relationship with the movable blade.

4. An electric scissors comprising a pair of cutting blades each having spaced keyhole slots and

Referring now more particularly to Figs. 9-12, inclusive, my invention also contemplates the provision of an improved blade construction and of improved means for securing the blade to the blade holder. Spaced pins 97 and 98 are positioned in the blade holders and are each provided with an enlarged head 99, a blade receiving portion 101 and a shank 102 adapted to be riveted over at the back of the blade holder, the blade receiving portion 101 being of such width as to receive the blade within narrow limits. The center of the blade holder is slotted, as shown at 103, to receive a spring detent 104, which is secured at one end to the blade holder by means of the pin 98. The blade 83 is provided with keyhole slots 105 and 106 having the same spacing as the pins 97 and 98 and with a slot 107 of such size as to receive the spring detent 104. In assembling the blade and holder, the blade is positioned against the holder with the pins 97 and 98 in the larger portion of the keyhole slots 105 and 106, the detent 104 being depressed into the opening 103. The blade is then moved longitudinally until the detent 104 moves into the opening 107 of the blade at which point the blade will be firmly held against movement. In order to remove the blade, it is only necessary to depress the detent and slide the blade along the holder. The keyhole slots 105 and 106 and the opening 107 are placed on the longitudinal center line of the blade, and the blade is sharpened on each side edge, the sharpening being accomplished by beveling the blade on only one side, each edge being beveled in the opposite direction, so that the blade may simply be reversed and replaced on the blade holder to provide a new cutting edge.

The manifold advantages of my improved construction will have become apparent to those skilled in the art. I have provided improved tuning construction and improved springs for tuning the oscillation of the armature. The screws 45 and 46 are of such size that the tuning springs may be inserted from outside the casing and the tension on each of the springs may be conveniently adjusted in this manner. Furthermore, I have provided an improved type of spring capable of materially longer life, possessing a materially lesser internal resistance and resulting in generally improved operation. The general assembly is such as to produce a well balanced unit

an intermediate slot, blade holders for holding the blades in cutting relation, each of said holders having spaced pins for reception in the keyhole slots of a blade, and a spring detent receivable in the intermediate slot for preventing the pins from moving from the slots, and electrical means for reciprocating one of the blade holders.

5 5. An electric scissors comprising a movable and a stationary scissors blade positioned in cutting relationship, electrical means for reciprocating the movable blade in a cutting stroke, and a resilient strip of metal secured at one end to the lower side of said stationary blade and terminating at its opposite end in a slot in the lower side of said blade for substantially preventing the vibration of said electrical means from being transmitted to a table as said stationary blade is moved thereover during cutting operations.

6. An electric scissors comprising a pair of blade holders, releasable cutting blades on said blade holders supported with their cutting edges in contact, means for reciprocating one of said blade holders in a cutting movement, and means for supporting said last mentioned blade holder for rotation on said reciprocating means away from the other blade holder for the exchange of said blades.

7. In an electric scissors, a stationary scissors blade, a movable scissors blade, means for driving said movable blade, means between the movable blade and said driving means for pivotally supporting the former on the latter for rotation toward and away from the stationary blade, and spring means for rotating the movable blade about said pivotal support to maintain the movable blade against the stationary blade with yielding pressure.

8. In an electric scissors having a vibratory armature and a stationary scissors blade, a movable scissors blade pivotally supported on said

armature for rotation laterally toward and away from said stationary blade, said blade having a portion extending from said pivotal support, and spring means on said armature positioned to engage said portion to rotate the movable blade against the stationary blade with yielding pressure.

9. In an electric scissors having a vibrating armature and a stationary scissors blade, a movable scissors blade supported on said armature for oscillation, one of said blades being pivotally supported to rotate laterally toward and away from the other, and spring means to rotate said blade for holding the cutting edges of said scissors blades together with yielding pressure.

10. An electric scissors comprising a pair of cutting blades each having spaced keyhole slots, blade holders for holding the blades in cutting relation, each of said holders having spaced pins for reception in the slots of a blade to secure the blade to the holder and latch means acting between the holder and the blade for preventing the pins from moving from the slots, and electrical means for reciprocating one of the blade holders.

11. An electric scissors comprising a casing shaped to provide a hollow handle and having an opening on the lower side thereof near the front, a stationary scissors blade detachably secured within said opening, a substantial part of said blade lying below said casing, a movable scissors blade in cutting relationship with the stationary blade, electrical means within the front part of the casing for driving said movable blade through said opening, and switch mechanism within the rear of said casing having a control element located on the top of said casing near the front end thereof for controlling the electrical driving means.

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