

[54] **ELECTRIC SCISSORS**

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30/122, 247, 249, 273

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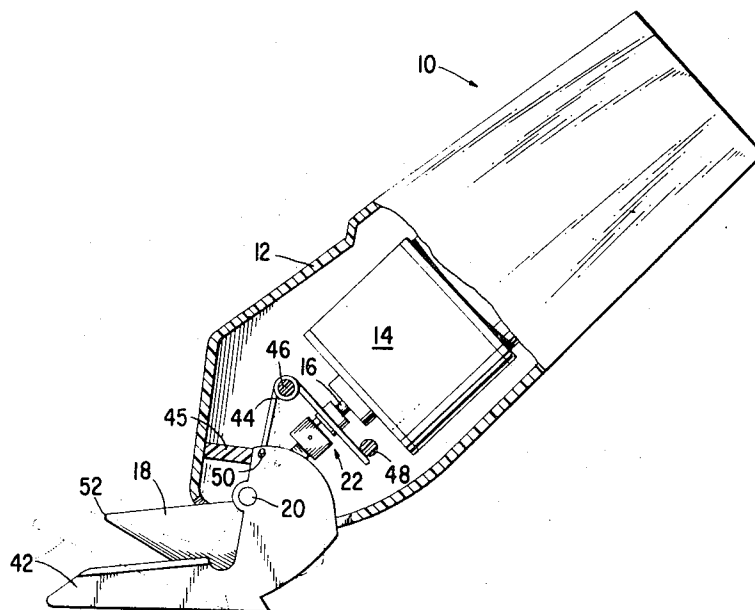
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[57]

ABSTRACT

An electric scissors having a rotary motor for oscillating a pivotal cutting blade to effect a cutting engagement along a small portion thereof with a ledger blade. The ledger blade, which is normally non-movable during the cutting operation, is mounted such that it may be selectively pivoted into engagement with the cutting blade to effect a snip cutting stroke along substantially the entire cutting blade or a portion thereof. Two embodiments are shown for effecting the snip cut. A first embodiment biases the ledger blade in a normally fixed position by a torsion spring which may be compressed to effect a snip by pushing the ledger blade against a table-like surface. The other embodiment disclose a lever arrangement whereby the ledger blade is pivoted to effect a snip by manually squeezing a lever-link against the force of a spring.

8 Claims, 3 Drawing Figures



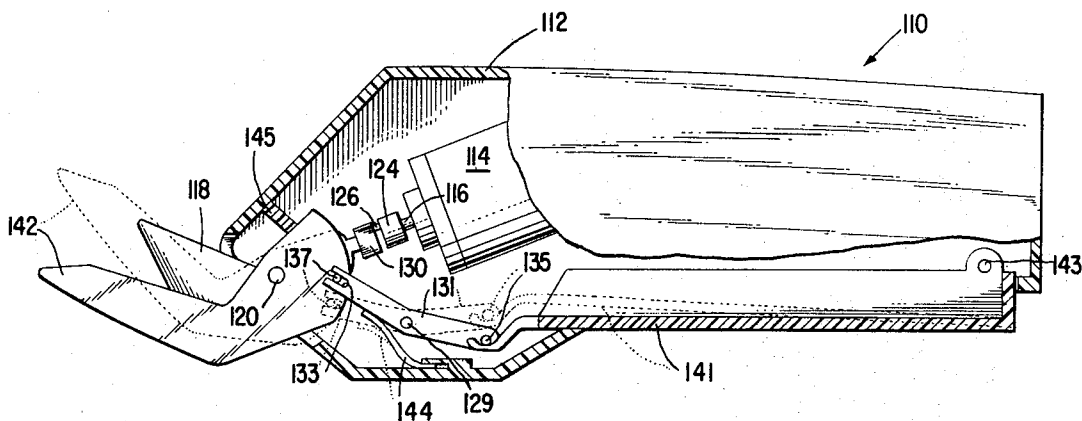
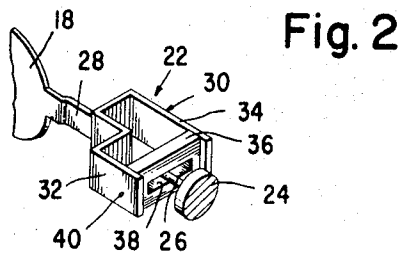
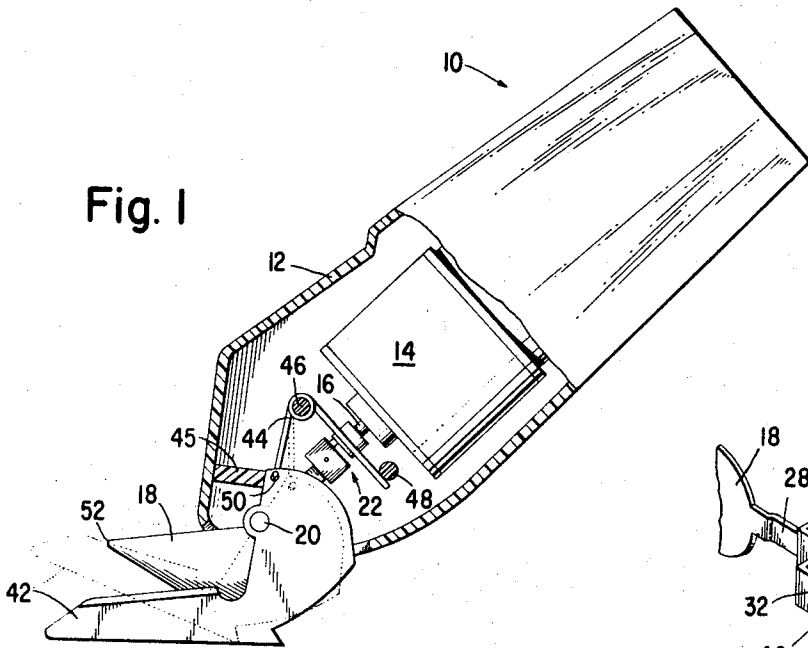


Fig. 3

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ELECTRIC SCISSORS

BACKGROUND OF THE INVENTION

This invention relates to power driven scissors or shears, and more particularly to a hand held fabric cutting electric scissors adapted for both rapid power cutting and manually controlled snipping.

Portable electric scissors of the prior art have a major disadvantage in that there is a general lack of control when cutting sharp angles and small contours. This was recognized in co-pending U.S. Patent application Ser. No. 51,467 filed on July 1, 1970 by John A. Herr and assigned to the present assignee. That application discloses an electric scissors having a controlled snip capability whereby the operator may selectively effect a full and controlled snip along substantially the entire cutting surface of the blade. Disclosed in the said co-pending application is a vibratory motor for normally oscillating the cutting blade. However, inasmuch as vibratory motors have an inherent tendency for the amplitude of vibration to decrease as the load increases the cutting efficiency of an electric scissors with this type power unit is greatly reduced because of less work output per stroke as the amplitude decreases. On the other hand, a rotary type motor may be applied in an electric scissors as a means for obtaining a constant amplitude oscillation of the cutting blade. However, because of the more complicated drive arrangements required when using a rotary motor to drive the cutting blade of an electric scissors, this invention is directed toward a simple, low cost and effective snip and cut electric scissors in which the ledger blade is selectively moved to effect a controlled snip.

SUMMARY OF THE INVENTION

The present invention, therefore, provides an electric scissors in which the ledger blade is fixedly mounted relative to the motor driven cutting blade and the scissors housing during normal cutting operations, but may be moved selectively to effect a controlled snip. In a first embodiment the ledger blade is directly connected to a spring which biases the ledger blade about a pin into a fixed position during normal cutting operation. To effect a snip the ledger blade is forced against a table-like surface as the scissors housing is turned relative thereto. In a second embodiment the ledger blade is resiliently biased about a pin into a fixed position during normal cutting by a pair of lever-links and a spring acting against one of the links. When a snip is desired the operator merely squeezes one of the lever-links to compress the spring and force the other link to pivot the ledger blade into engagement with the motor driven cutting blade.

It is, therefore, a primary object of the present invention to provide a power driven hand held scissors having a ledger blade mounted so as to be fixed during the normal cutting operations, but which is selectively movable to effect a controlled snip.

Another object of this invention is to provide an electric scissors having a cutting blade adapted to oscillate into engagement with a normally fixed ledger blade, and having means for permitting the ledger blade to be moved into cutting engagement with the cutting blade to effect a snip.

A further object of this invention is to provide an electric scissors having a rotary motor and having the capability of selectively effecting a controlled snip.

A still further object of this invention is to provide an electrically powered scissors in which the ledger blade may be moved selectively to effect a cut along substantially the entire cutting surface of the driven blade.

BRIEF DESCRIPTION OF THE DRAWINGS

For a fuller understanding of the nature and objects of the invention reference should be had to the following description taken in connection with the accompanying drawings, in which:

FIG. 1 is an elevational view of an electric scissors incorporating a first embodiment of our invention, with parts of

said scissors broken away and in cross section, and with the ledger blade illustrated by solid lines in its normally fixed position and by broken lines in the full snip position;

FIG. 2 is a perspective view partially broken away of the drive incorporated in the scissors of FIG. 1; and

FIG. 3 is an elevational view of an electric scissors incorporating a second embodiment of our invention, with parts thereof partially broken away and in cross section, and with the ledger blade shown by solid lines in its normally fixed position and with broken lines illustrating the full snip position.

DESCRIPTION OF THE INVENTION

Referring to the drawings wherein like elements are designated by like numerals, an electric scissors incorporating a first embodiment of our invention is illustrated in FIG. 1 and is generally indicated as 10. The scissors unit includes a housing 12 preferably comprising two molded sections secured together by means of screws (not shown). Mounted within the housing is an electric motor 14 preferably of the rotary type having a rotatable output shaft 16.

A cutting blade 18 is pivotably mounted in the housing on a pin or axle 20. The blade 18 is driven from the output shaft 16 of the motor 14 by any drive means capable of converting rotary motion to pivotal oscillatory motion. A drive having this capability is generally indicated as 22 and is clearly illustrated in FIG. 2 as comprising a crank 24 having an eccentrically mounted crank pin 26. Secured to the tail end 28 of the blade 18 is a yoke member 30 having a pair of legs 32 and 34 between which is mounted a block member 36 having a slot substantially parallel to the pin 20. A pair of pins 40 (only one of which is shown) mount the block 36 between the legs 32 and 34 to allow for limited pivotal movement of the block. In operation, as the motor shaft 16 rotates the crank pin drives the yoke 30 and blade 18 through the block 36 pivotally about the pin 20. The slot 38 effectively restrains the motion of the yoke 30 to a single plane substantially normal to the pin 20.

To effect a cut under normal operation, the blade 18 operates against a ledger blade 42 by pivotably oscillating into and out of cooperative cutting engagement therewith. The cut, it should be noted, occurs along a very small portion of the blades, since the oscillation of blade 18 is small. To maintain the ledger blade fixed during normal cutting operation, but to allow the blade to move during the snip operation, the ledger blade is pivotably mounted on the pin 20 along with the blade 18. The ledger blade is biased to a normally fixed position about the pin 20 in a direction that tends to separate the two blades, i.e., counterclockwise as viewed in FIG. 1, by a torsion spring 44. A stop 45 may be utilized to prevent further counterclockwise movement of the blade 42 during normal cutting so that the spring need not be of excessive size. The spring 44 is mounted upon a boss 46 which may form a portion of the means for securing the molded housing sections together. One end of the spring 44 is located to abut against a stop member 48 while the other end thereof is bent to securely fit a hole 50 in the blade 42. The location of the hole 50 is such that the torque of the spring creates a bending moment on the blade 42 relative to the pin 20 so that the blade 42 is biased away from the blade 18, and cannot move unless and until the spring 44 is compressed.

When it is desired to effect a snip cut with the scissors disclosed in FIG. 1, the operator merely forces the ledger blade 42 against a table-like surface and rolls the housing 12 relative to that blade to create a bending moment on the blade that overcomes that due to the spring. This compresses the spring to the dotted position shown in FIG. 1 and the ledger blade may be moved to contact a portion of or the entire blade 18 to effect a snip with the blade 42 up until its tip 52.

The embodiment of FIG. 1, of course, requires a surface against which the ledger blade must be forced to effect a snip. It is often desirable to have a scissors of this type in which a snip may be performed without the aid of such a surface. The embodiment of FIG. 3 discloses an electric scissors 110 having

this capability. Mounted within a housing 112 is a rotary type motor 114 having an output shaft 116. A cutting blade 118 is pivoted on a pin 120 in the housing and is pivotably oscillated from the shaft 116 by a crank 124 mounted on the shaft and which includes a crank pin 126 which oscillates the blade 118 through a yoke member 130 secured to the tail 128 of the blade 118. This drive is similar to that described in connection with the embodiment of FIG. 1 and is detailed in FIG. 2.

The blade 118 operates against a ledger blade 142 to effect a cut along a small portion of the blade. The ledger blade 142 is pivoted on the pin 120 and is biased to a normally fixed position, as shown by the solid lines, by means of a resiliently mounted lever arrangement, presently described.

Pivotably mounted on a pin 129 in the housing is a link 131 having an open slot 133 at one end thereof and a pin 135 adjacent the other end thereof. Mounted on the blade 142, at a location relative to the pin 120 such that the blade 142 is normally biased away from blade 118, is a pin 137. The pin 137 is fitted within the slot 133 to restrain the blade 142 against movement independently of the link 131. A second link 141 is pivotably mounted at the rear of the housing by means of a pin 143, and is adapted to engage the pin 135. A leaf spring 144 acts on the link 131 to bias the ledger blade 142 away from the oscillatable blade 118 and toward a stop member 145 similar to that of stop 45.

As can be readily seen from FIG. 3 of the drawings, the spring and lever arrangement is such that the ledger blade is biased counterclockwise about pin 120 and remain as shown by the solid lines until the force of the spring is overcome. This is the position of the ledger blade during the normal cutting operation. When it is desired to effect a snip, the operator merely squeezes the link lever 141. The pin 135 on link 131 thereby causes this link to pivot about pin 129 and compress the spring 144. The slot 133 of link 131 thereby applies a force against pin 137 on the ledger blade to pivot the blade clockwise to effect a snip, as shown by the broken lines in FIG. 3. As in the embodiment of FIG. 1 the snip may be a full contact between the ledger blade and the cutting blade or may be a portion thereof which is larger than the contact made between the blades during the normal cutting operation.

Numerous alterations of the structure herein disclosed will suggest themselves to those skilled in the art. However, it is to be understood that the present disclosure relates only to preferred embodiments of my invention which is for purposes of illustration only and not to be construed as a limitation of the invention. All such modifications which do not depart from the spirit of the invention are intended to be included within the scope of the appended claims.

Having thus disclosed the nature of the invention, what we claim herein is:

1. An electric scissors, comprising a housing, a motor mounted in said housing, a normally fixed ledger blade, mounting means including pivot means for pivotably mounting said ledger blade to said housing, a second blade supported in said housing and adapted to be oscillated by said motor,

drive means connecting said motor and said second blade for oscillating said second blade into and out of cooperative cutting engagement with said normally fixed ledger blade along a first contact area of said blades, said mounting means further including resilient means for selectively permitting the normally fixed ledger blade to be pivoted manually from the normally fixed position toward and into cutting engagement with said second blade along a second contact area of said blades to effect a snip, said second area being greater than said first area.

2. An electric scissors as recited in claim 1 wherein said resilient means comprises a torsion spring having one end thereof secured to said ledger blade at a location with respect to said pivot means such that when said ledger blade is selectively relatively pivoted about said pivot means into cutting engagement with said second blade to effect a snip said spring is compressed from a normal into an energy stored condition.

3. An electric scissors as recited in claim 2 wherein said pivot means for supporting said ledger blade also pivotably supports said second blade for oscillation by said drive means.

4. An electric scissors as recited in claim 3 wherein said motor is a rotary motor.

5. An electric scissors, comprising a housing, a motor mounted in said housing, a normally fixed ledger blade mounted in said housing, a second blade supported in said housing and adapted to be oscillated by said motor, drive means connecting said motor and said second blade for oscillating said second blade into and out of cooperative cutting engagement with said normally fixed ledger blade, pivot means for supporting said ledger blade in said housing, lever means connected to said ledger blade and pivotably secured to said housing, and a spring in engagement with said lever means for biasing the same, said lever means being connected to said ledger blade at a location with respect to said pivot means such that said ledger blade is biased away from said second blade about said pivot means, said lever means being adapted to be manually selectively pivoted relative to said housing to overcome the bias of said spring for pivoting said ledger blade into cutting engagement with said second blade to effect a snip.

6. An electric scissors as recited in claim 5 wherein said pivot means for supporting said ledger blade also pivotably supports said second blade for oscillation by said drive means.

7. An electric scissors as recited in claim 8 wherein said motor is a rotary motor.

8. An electric scissors as recited in claim 5 wherein said lever means comprises a first link, a pin pivotably mounting said first link in said housing, a second link having first and second extremities, said second link being pivotably mounted intermediate said extremities in said housing, means connecting said first extremity to said first link for pivotally moving said second link relative to said housing upon pivotal movement of said first link, and means for connecting said second extremity to said ledger blade.

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