

United States Patent

Herr

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[54] **ELECTRIC SCISSORS**
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 [58] Field of Search.....30/201, 202, 203, 228, 233, 30/122

[57] **ABSTRACT**

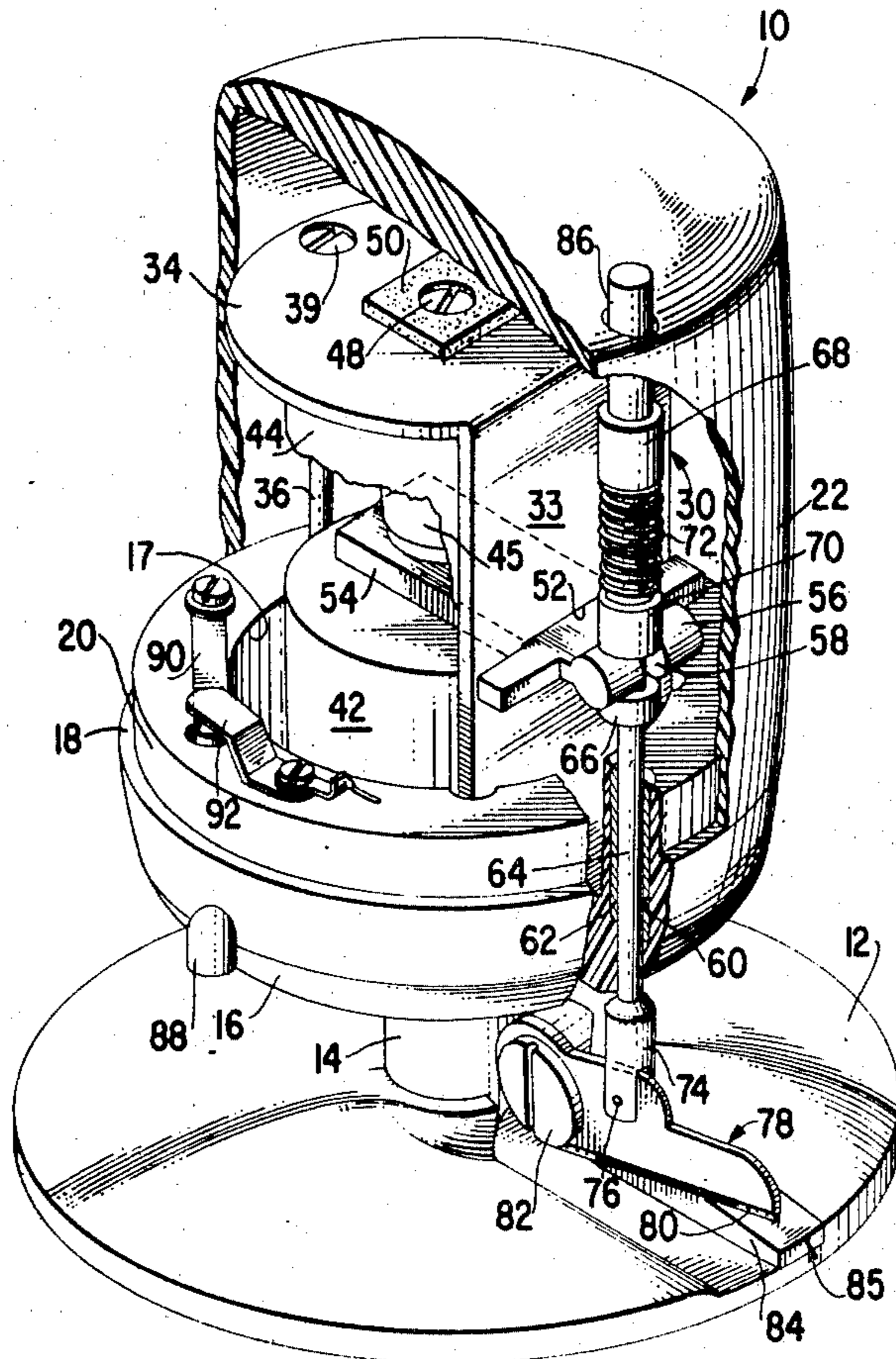
An electric scissors unit having a vibratory motor for oscillating a pivotal blade to effect a cutting engagement along a small portion thereof with a ledger blade. A drive rod connected to the pivotal blade is oscillated by a pivotally mounted armature reed which forms the movable element of the motor. A portion of the drive rod projects out the housing of the unit and is accessible for engagement by the operator for overriding the motor to manually effect a controlled snip cutting stroke along substantially the entire portion of the blade.

[56] **References Cited**

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8 Claims, 4 Drawing Figures



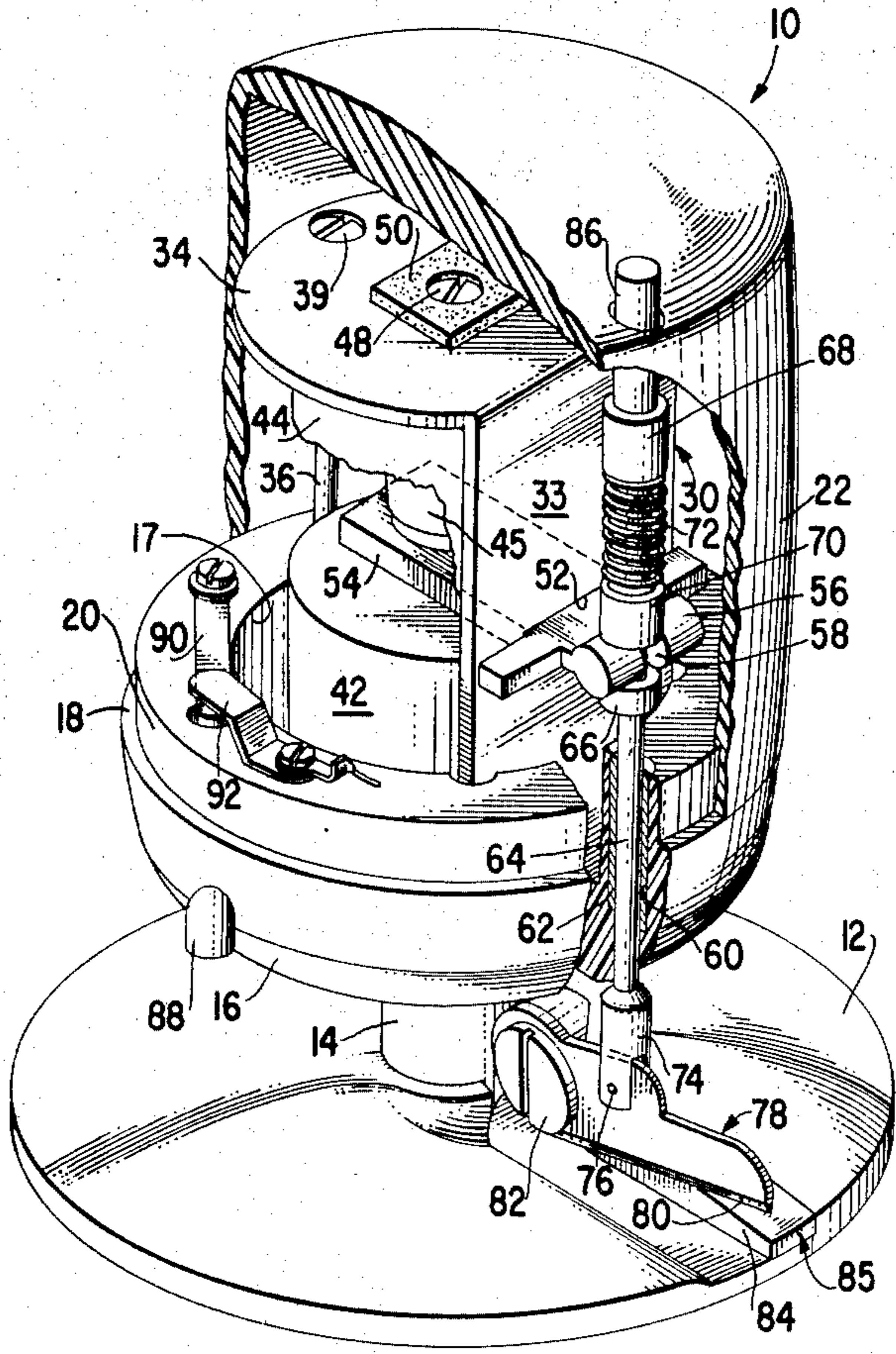


Fig. 1

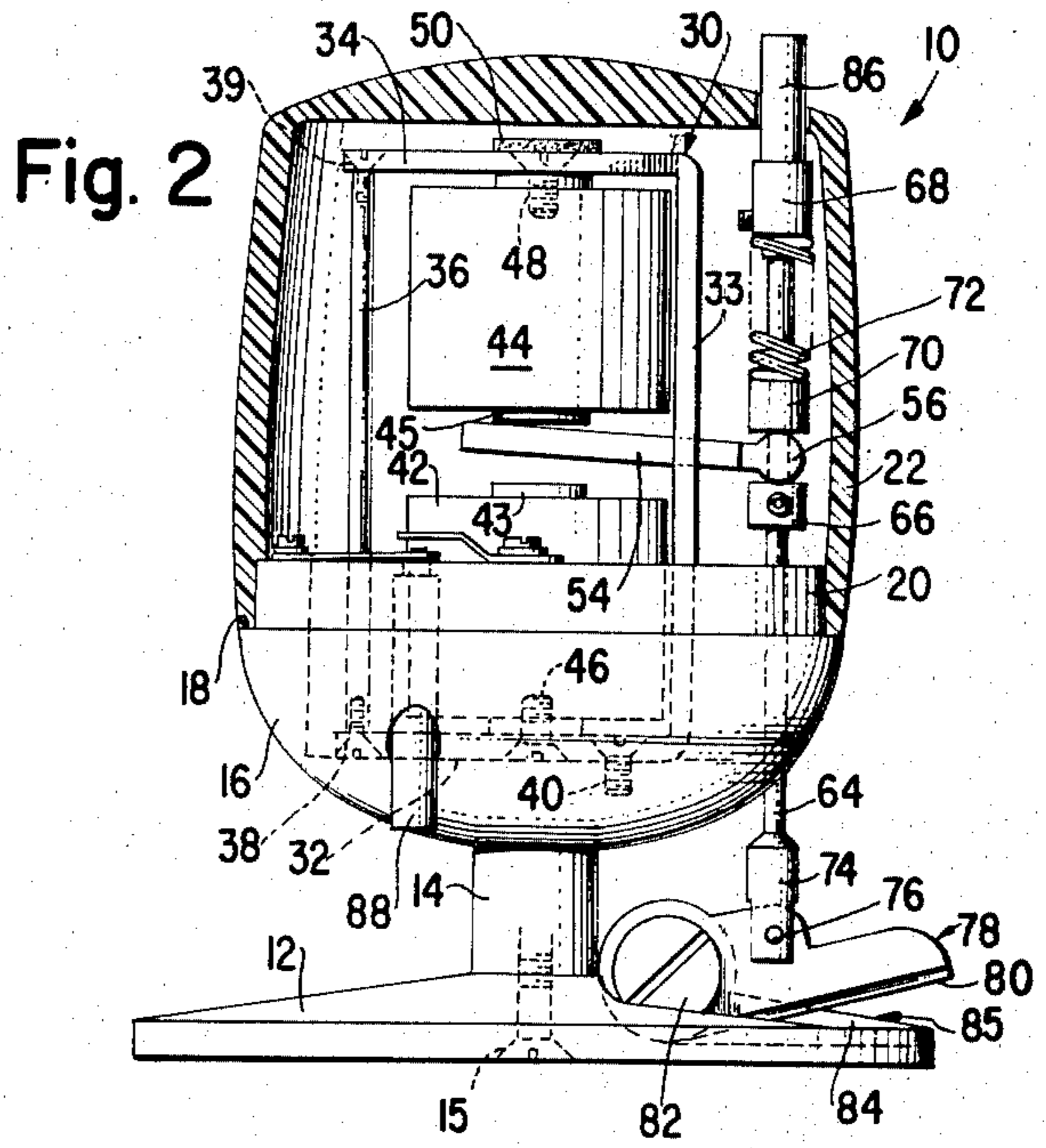


Fig. 2

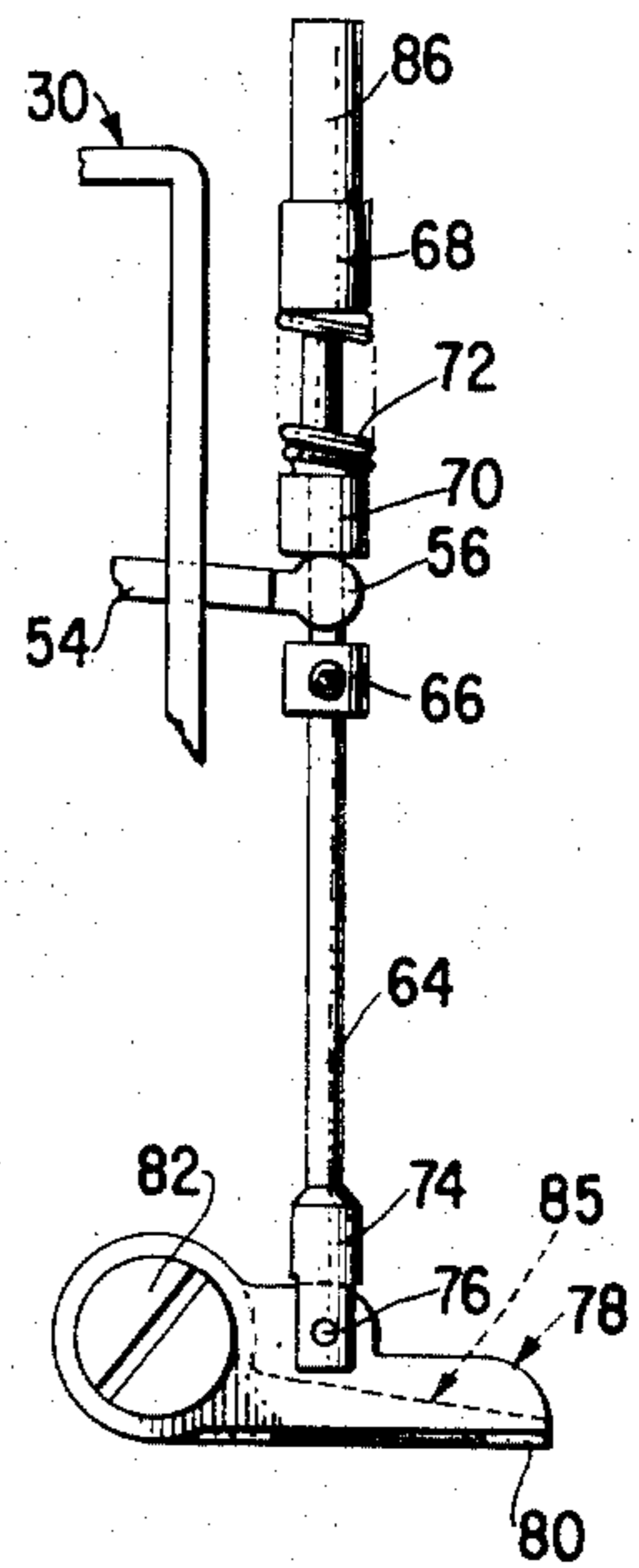


Fig. 3

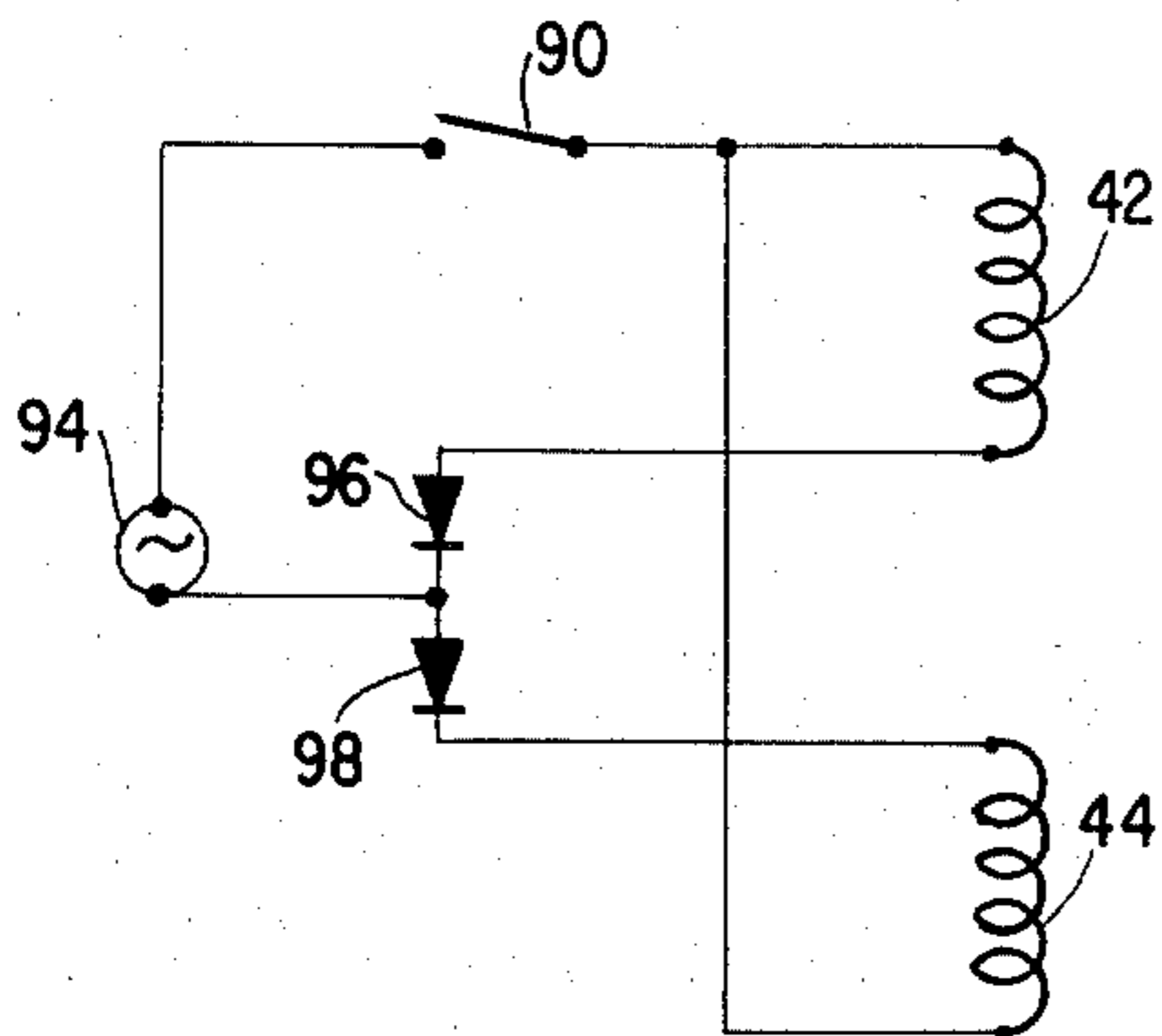


Fig. 4

WITNESS:

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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 controlled snipping.

Portable electric scissors adapted for cutting fabrics have enjoyed immense popularity in recent years. This growth in popularity may be, at least partially, attributed to the rapid growth of the home sewing market and the increased number of women making their own clothing with the aid of purchased patterns. The convenience and speed with which a fabric may be cut to a pattern by a hand held electric scissors is among the major advantages of this appliance. One of their disadvantages, however, is the lack of control thereover when used for cutting sharp angles and small contours, for example, for cutting the V-shaped darts and grooves along those portions of a pattern which are to be aligned and joined. Moreover, they are also inconvenient for cutting slots in buttonholes, for cutting loose threads and the like, because of the rapidity with which they operate. Under these circumstances the operator usually must resort to manually operated scissors which give her complete control of the cutting. It would, therefore, be desirable, in an electric scissors of the type described to have a controlled snip capability such that there is no need to switch back and forth between a manually operated scissors and a power operated scissors during the normal course of cutting out a pattern and finishing the garment. This invention is directed towards a simple low cost and effective means for obtaining that result.

SUMMARY OF THE INVENTION

It is, therefore, a primary object of the present invention to provide a power driven hand held scissors having means for selectively effectuating a controlled snip cut between the blades.

Another object of this invention is to provide a manual override feature in an electric scissors whereby the operator may control precisely the size and speed of the cut to effect a snip.

A further object of this invention is to provide an electrically powered scissors in which at least one of the blades may manually be actuated selectively to effect a single cut along substantially the entire blade cutting surface.

A still further object of this invention is to provide an electric scissors having a manually actuated snip feature for selectively overriding the power drive to actuate the power driven blade.

To accomplish these objectives the present invention provides an electric scissors having a drive rod oscillated during normal powered cutting by an electric vibration motor for actuating a cutting blade into engagement with a ledger blade, the drive rod being available externally of the scissors housing for manual engagement by the operator for overriding the motor to effect a snip function by the blades.

BRIEF DESCRIPTION OF THE DRAWINGS

For a fuller understanding of the nature and objects of the invention reference should be had to the follow-

ing description taken in connection with the accompanying drawings, in which:

FIG. 1 is a perspective view partially broken away and sectioned of an electric scissors incorporating the manual snip feature of the present invention;

FIG. 2 is an elevational view of the scissors of FIG. 1 with the top housing in cross section and the cutting blade and drive rod in their lowermost position during normal cutting operation;

FIG. 3 is an elevational view of a portion of FIG. 2 but with the cutting blade and drive rod in their lowermost position during a snip; and

FIG. 4 is a schematic drawing of a simple circuit capable of providing proper operation of the motor during the cutting mode.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings wherein like elements are designated by like numerals, an electric scissors embodying the present invention is generally indicated as 10 and includes a bottom base member 12 adapted for setting the unit upon a table. A pedestal 14 is secured to the base 12 by, for example, a screw 15, and is further secured to a bottom housing 16 of the unit to support the same in spaced relation to the base to thereby provide a clearance for the blade. The bottom housing 16 comprises a substantially bowl shaped member having a recessed opening 17 formed in the top portion thereof to receive the driving elements of the scissors. Formed about the periphery of the bottom housing adjacent to the top thereof is an annular shelf 18 defined by an annular wall 20 which has a diameter slightly less than the housing diameter just below the shelf. An upper housing or cover comprising a barrel shaped member 22 having a substantially closed top surface is adapted to set on the shelf 18 and be secured to the annular wall 20 by any conventional securing means. The frame comprising the housing 16 cover 22, pedestal 14 and base 12 are designed to comfortably fit the hand of an operator, and may be used entirely hand held or supported by the base 12 on a table.

Mounted within the housing 16 is a substantially U-shaped support bracket 30 having a lower leg 32, an upstanding leg 33 rising from one end of the lower leg and an upper leg 34 extending from the upper leg substantially parallel to and overlaying said lower leg. A support rod 36 substantially equal to the length of leg 33 is secured to the bottom leg 32 by a screw 38 and the upper leg 34 by a screw 39 so as to provide extra rigidity to the support bracket and aid in absorbing the vibrations of the motor. One or more screws 40 secure the lower leg 32 of the bracket 30 to the lower housing 16. A vibratory type electric motor comprising a pair of coils 42 and 44 respectively wound about a soft iron core 43 and 45 supplies the motive power for the unit. The motor is mounted between the legs 32 and 34 of the bracket by means of screws 46 and 48 secured to the respective core 42 and 45. A rubber snubber element 50 may be mounted about the top screw 48 to thereby prevent excessive vibration and noise if the cover should contact the upper leg while the scissors are in operation. A similar snubber may be mounted at the bottom of the leg 32.

Formed within the upstanding leg 33 of the bracket 30 substantially midway between the legs 32 and 34 is an elongated slot 52 through which extends a lever 54 forming the armature of the motor. The armature which extends between the cores 43 and 45 at one extremity includes at the other extremity a cylindrically shaped element 56 having a substantially vertical slot 58 formed therein. There is, of course, nothing critical about the cylindrical shape; a flat slotted member would serve as well. An elongated substantially vertical slot 60 is formed in the lower housing 16 at the front thereof and a bearing member 62 is fitted into the slot. A drive rod 64 is adapted to slidably oscillate linearly within the bearing 62. The rod 64 extends upwardly through the slot 58 and includes a mounting collar or abutment member 66 which is secured thereto at a position located below the horizontal or neutral position of the cylindrical portion 56 of the armature lever 54. A second mounting collar or abutment member 68 is secured to the rod 64 above and spaced from the collar 66. Mounted on the rod 64 for free slidable movement thereon is a bushing 70 which is positioned against the upper surface of the cylindrical portion 56 by means of a compression spring 72 which abuts the lower surface of the collar 68. Secured to the bottom end of the rod 64 is a coupling member 74 having a bifurcated lower portion. A pin 76 pivotally secures cutting blade 78 between the prongs of the lower portion of member 74. The blade 78, which has a cutting edge 80, is pivotally connected at the back thereof to the base 12 by means of a machine screw 82 and cooperates with an edge 84 of a ledger blade 85 for cutting material placed or fed therebetween in the usual manner. It is thus clear that as the armature 54 oscillates or vibrates this motion is transmitted to the rod 64 by direct contact of the cylindrical end of the armature with the collar 66 and the indirect contact of the cylindrical end of the armature with the collar 68 through the spring 72 and bushing 70. The upper free end 86 of the rod 64 protrudes through a hole in the top surface of the cover and is available to be selectively depressed by the operator to override the oscillatory motion provided by the motor to effect the snipping feature of this invention.

Mounted in a slot in the lower housing is a switch actuator 88 which protrudes up through the lower housing into contact with a switch element 90. Depression of the actuator 88 causes the switch to contact an electrical element 92 to close the circuit and effect a flow of current through the coils. Figure 4 shows an electrical circuit which may be used for operating the electric scissors during the cutting mode from a source of alternating current 94. A pair of rectifiers 96 and 98 are connected as shown in the drawings so that during each half cycle of the alternating current supply one of the coils 42 or 44 will be energized and during the other half cycle of the current supply the other of the coils 44 or 42 will be energized. Thus, during the half cycle that coil 42 is energized the field generated thereby causes the soft iron core 43 to attract the armature 54 which pivots about the slot 52 as a fulcrum and results in the cylindrical end 56 moving upwardly against the member 70 to force the spring 72 against the collar 68 to drive the rod 64 upwardly and thus the blade 78 is pivoted upwardly. During the other half cycle the coil

44 is energized and its field causes the soft iron core 45 to attract the armature 54. The armature thus pivots about slot 52 as fulcrum and causes the cylindrical end 56 to swing downwardly against the collar 66 to thereby drive the rod 84 downwardly which pivots the blade 78 downwardly against the cutting edge 84 of the ledger blade 85 to effect a cut. It is thus clear that as the armature 54 is vibrated between the cores 43 and 45 the rod 64 is reciprocated within the bearing 62 and oscillates the blade 78 pivotally against the ledger blade 85. When it is desired to override the cutting operation to provide the snip function the operator merely pushes the end 86 of the rod 64 downwardly to force the blade 78 pivotally downwardly against the ledger blade 85. This may occur with the motor switched off or the motor may be overridden by the action.

During the normal cutting operation the stroke of the cutting blade 78 is such that the cutting edge 80 of the blade effects a cut along a very small portion thereof since the path of vibration of the armature is limited to the space between the relatively closely spaced cores 43 and 45. This is clear from FIG. 2 where the blade 78 and the rod 64 are shown in their lowermost positions during the downward stroke of the normal cutting operation. However, as seen in FIG. 3, when the end 86 of the rod is manually depressed to effect a snip the spring 72 is compressed against the cylindrical end 56 of the armature and the rod 64 is permitted to travel downwardly until the blade 78 is in full contact with the ledger blade 85, i.e., the cutting edge 80 may fully contact the surface 84. The spring 72 thus is compressed only slightly during normal operation yet is substantially fully compressed during snip operation. Although a controlled snip occurs when the blades make full contact, i.e., when the front tip of the blade 78 is effective during the snip, the present invention permits the operator to make cuts with less than full blade contact by controlling the manual depression of end 86 of the rod 64.

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 to a preferred embodiment of my invention which is for purposes of illustration only and not to be construed as a limitation of the invention. For example, a single core and coil vibratory motor may be utilized in place of the disclosed two core/coil unit by including a spring to return the armature during a portion of the cycle. Also, a rotary motor driven as shown in U. S. Pat. No. 3,365,963 issued Jan. 20, 1968 to R. Happe may be utilized. Moreover, only one abutment member, e.g. 66, may be used if an extension spring is utilized in place of the compression spring 72 and securing its ends respectively to the rod and the cover. 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 my invention, what I claim herein is:

1. An electric scissors, comprising a frame, electrically actuated motor means mounted on said frame, a ledger blade mounted on said frame, a cutting blade, means for supporting said cutting blade on said frame for movement relative to said ledger blade, means connecting said cutting blade to said motor means for

oscillating a first portion of said cutting blade into and out of cutting engagement with a cooperative first portion of said ledger blade to shear material fed therebetween, and means independent of said motor means for selectively moving a second portion of one of said blades into cooperative cutting engagement with a second portion of the other of said blades to effect a controlled snip, said second portions being greater than said first portions.

2. An electric scissors as recited in claim 1 wherein said means connecting said second blade to said motor means comprises a drive rod, at least one abutment member secured on said rod, said motor having an armature adapted to vibrate cyclically, means on said armature for engaging said abutment member to drive said second blade into cutting engagement with said first blade, said means for selectively moving one of said blades comprises resilient means secured to said rod for disengaging said abutment member from said armature upon selective manual actuation of said rod.

3. An electric scissors, comprising a frame a ledger blade fixedly mounted on said frame, a cutting blade pivotably mounted on said frame for cooperatively engaging said ledger blade, electrically actuated motor means mounted on said frame, a drive rod, power transmitting means coupling said motor to said drive rod for oscillating said drive rod, means for connecting said drive rod to said cutting blade to pivotally oscillate a portion of said cutting blade into and out of cutting engagement with a portion of said ledger blade, and means for selectively uncoupling the drive rod from the motor and for moving the drive rod to pivot substantially the entire cutting blade into cutting engagement with the ledger blade to effect a snip.

4. An electric scissors, comprising a frame, a ledger blade fixedly mounted on said frame, a cutting blade

pivotably mounted on said frame for cooperatively engaging said ledger blade, an electrically actuated motor mounted on said frame, said motor having a vibratory armature, a drive rod, power transmitting means including first and second spaced part abutment members on said drive rod coupling said motor to said drive rod for oscillating and drive rod, means for connecting said drive rod to said cutting blade, means for applying a force to said first abutment member said armature to drive said rod in a direction to engage a portion of said cutting blade with a portion of said ledger blade to effect a cut on material placed therebetween, means for applying a force to said second abutment member by said armature to disengage said blade portions, and means for permitting the drive rod to be moved selectively to override the power transmitting means and pivot substantially the entire cutting blade into cutting engagement with the ledger blade to effect a snip.

5. An electric scissors as recited in claim 4 wherein said means for permitting the drive rod to be moved selectively comprises a resilient member mounted on said rod in abutting relation with said second abutment member, said resilient member further forming an element of said means for applying a force to said second abutment member by said armature.

6. An electric scissors as recited in claim 5 wherein said resilient member is a compression spring, said spring being compressed substantially greater during snip operation than during cutting.

7. An electric scissors as recited in claim 6 wherein said rod extends through said frame and is available to be depressed manually to effect a snip.

8. An electric scissors as defined in claim 1 wherein the second portion of said cutting blade is substantially the entire cutting blade.

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