June 22, 1965 G. W. MOUNT 3,189,997

HAND PORTABLE CUTTING DEVICES

Filed April 23, 1963

Fig. 1

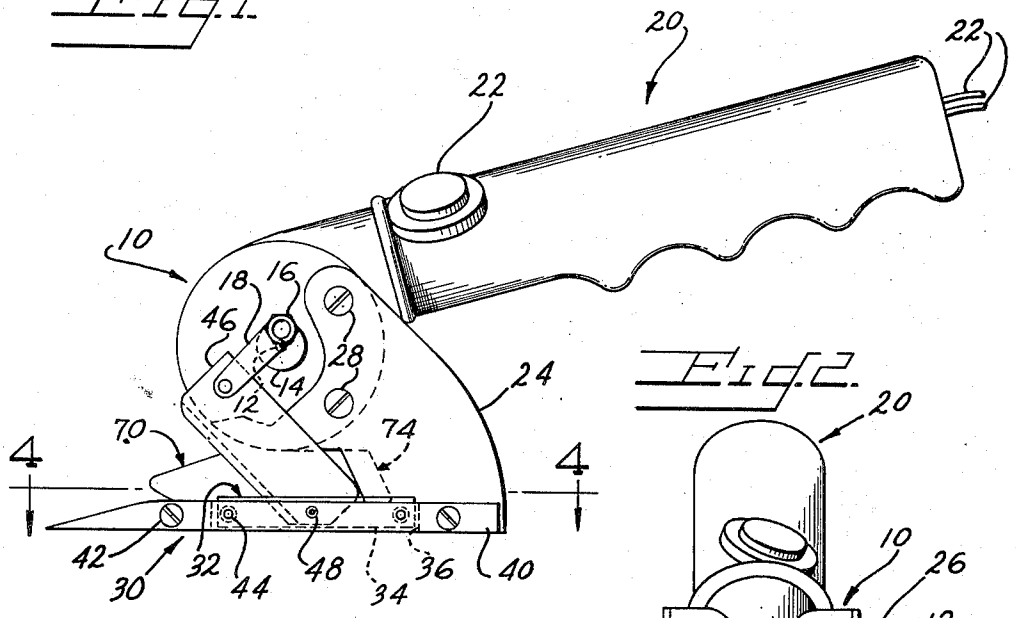


Fig. 2

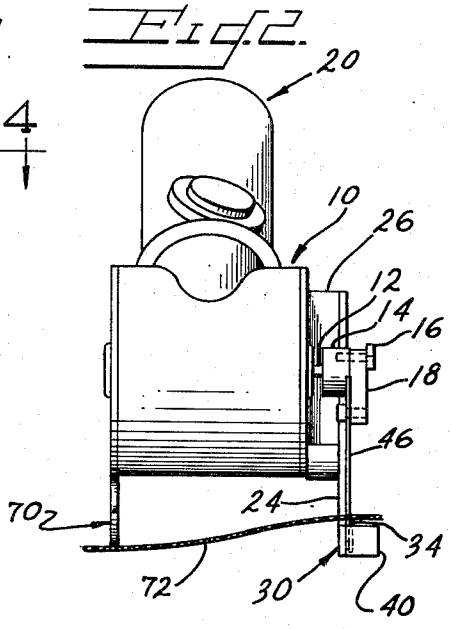


Fig. 3

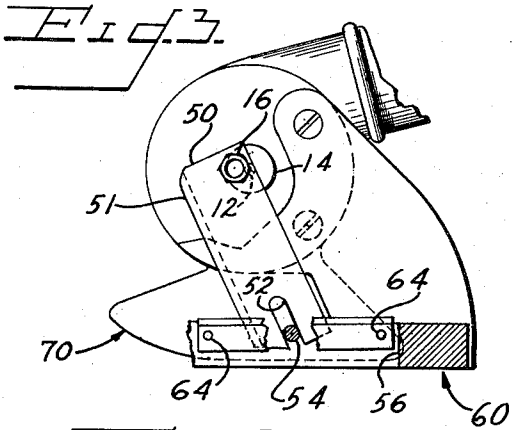
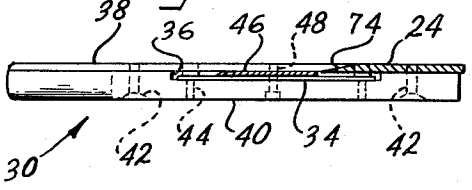


Fig. 4



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United States Patent Office 3,189,997
Patented June 22, 1965

3,189,997

HAND PORTABLE CUTTING DEVICES

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Filed Apr. 23, 1963, Ser. No. 275,115
4 Claims. (Cl. 30—228)

This invention relates to motorized cutting devices and particularly to hand portable electrically driven cutiers. The object of the invention is to provide an improved cutter having either a scissors type action, a slicing type action, or a combination of the two actions.

A principal object of the invention is to provide a cutting device in which an extremely small motor may be utilized for effective cutting action by reason of the mounting of the movable blade of the device. An additional advantage gained by the blade mounting is a more effective use of an extremely thin blade such as blades of the safety razor type.

A further object of the invention is to provide an arrangement in a cutting device of the class described which may readily be adapted either for a straight scissors type action or for slicing or sliding knife type of action.

These and other objects and advantages of the invention will be apparent from the following description and accompanying drawings in which,

FIG. 1 is a side elevational view of a cutting device embodying the invention;

FIG. 2 is a front end view thereof;

FIG. 3 is a view similar to FIG. 1 with parts cut away and showing a modification of the invention adapted for a sliding knife and scissor action; and

FIG. 4 is a view on line 4—4 of FIG. 1.

In the embodiment of the invention illustrated by FIGS. 1, 2 and 4 the device is shown as a straight scissors type of cutter. A cylindrical motor casing **10** encloses a motor (not shown) having a shaft **12** (FIG. 2) extending from one end of the casing. The shaft is provided at its outer end with an enlarged drive collar **14** having an eccentrically placed headed cam or pin **16** fitted to extend from the outer face of the collar. In this embodiment a link **18** is journaled on the pin **16** as will be later described.

Extending rearwardly from the casing **10** is a carrying handle **20** with grip for manipulating the device. At the rear end of the hand grip are lead wires **22** for connection of the motor to a suitable source of electricity. This supply may be rechargeable batteries or plug-in to conventional power line as desired. A push button **22** for on-off actuation of a motor switch (not shown) is located at the inner end of the grip for convenient thumb operation.

A frame plate **24** is mounted at the end of the casing **10** from which shaft **12** extends. Arcuately shaped spacer piece **26** supports the plate member in spaced relation to the end of the casing and the assembly is fixed to the casing by mounting screws as at **28**. Frame plate **24** includes a rearwardly and downwardly directed panel or web having at its lower edge a forwardly extending foot member generally indicated by the numeral **30**.

The foot **30** is disposed in spaced underlying relation to the shaft collar **14** and has a shearing edge **32** provided by a replaceable blade **34** fixed in a slot **36** of the foot and projecting slightly above its upper surface. Edge **32** constitutes the stationary edge of the device. As shown by FIG. 4 the foot is formed from an integral extension **38** of the plate **24** together with a foot piece **40** joined to the extension as by screws **42**. The slot **36** is formed by a rectangularly recessed portion of piece **40** facing the opposing wall of extension **38**. Blade **34** is held against the recessed wall of slot **36** by the shoulders

of mounting screws **44** which are threaded into the foot piece.

Also mounted in slot **36** is the lower end of a movable cutting edge, such as that of a blade **46** pivoted on a pin **48** which extends through piece **40** and is removably threaded into panel **38**. The slot accommodates the width of the two blades so that the cutting edges are in adjacent relation for good cutting action. The edge of blade **46** is angularly directed upwardly of the lower edge **32** and in the upper portion of the blade a pivotal connection is made with the lower end of link **18**.

As will appear from FIG. 1 rotation of the motor shaft will drive the eccentric pin **16** to rapidly oscillate the blade **46** on its pivot **48**. This cutting action is of the scissors type.

In the embodiment of FIG. 3 a movable blade **50** is shown directly pivoted on eccentric pin **16**. With the direct connection and resulting action on blade movement slot **52**, preferably open ended, is provided in the lower end of the blade parallel to the cutting edge **51** of the blade. The open ended slot straddles a pin **54** set in opposing walls of slot **56** of the foot member **60**. Since the blade **50** reciprocates longitudinally foot member **60** is of a greater depth than member **30** of the embodiment of FIG. 1. Slot **56** thus completely encloses the lower end of blade **50** for its full linear stroke. A lower stationary edge is provided by a blade **62** fixed in slot **56** by mounting screws **64** similarly to the blade **34** of FIG. 1.

While the action of blade **50** on rotation of the motor shaft will be noted as including a rocking movement it will be seen that the angular relationship of the blade, pin **54** and pin **16** will provide primarily a slicing or sliding action on a workpiece fed against the cutting edge **51**. This is in contrast to the scissors type of action which is developed in the embodiment of FIG. 1. And it will be further appreciated that by changing the location of pin **54** relative to pin **16**, as by moving it rearwardly on foot **60**, a different angular relationship can be established so as to impart more of the scissors movement to the cutting action in this form of the device.

In each of the embodiments of the device there is preferably included a shoe plate **70** fixed at the opposite end of the motor casing **10**. This is in the form of a "skid" element to assist in supporting and guiding the device on platform surfaces during a cutting operation. The lower edge of the shoe as best seen from FIGS. 2 and 3 is slightly elevated from the lower edge of the foot. This is for the purpose of accommodating the thickness of a piece of work which is to be cut. In FIG. 2 there is shown a cloth piece **72** in position for cutting, the shoe riding on the upper surface of the cloth in spaced relation to the foot while the latter underlies the cloth for moving the blades along a desired line of cut. The foot has a tapered toe for sliding under a flat work piece and at **74** the edge of the web of plate **24** is beveled immediately behind the movable blade for smoothly engaging a cut edge.

It is to be noted that the scissors type of device as in FIG. 1 has a short stroke and that an extremely small light motor will be able to oscillate a light blade rapidly and effectively. This type may be used advantageously in cutting yard goods or other fabrics such as upholstery fabrics and paper products such as cardboard etc. The blade is held at each end and with the outer end being forced down on the work during the cutting stroke an extremely thin type of blade can be used to advantage. As will be appreciated the blades as shown are easily replaceable when worn. With stouter blades closely woven carpet fabrics can be readily cut.

The sliding type of device as in FIG. 3 is useful for cutting tougher materials such as stiff linoleums, foam rubbers, and other plastic sheet materials or the like. For

stiffer and more brittle sheet materials a serrated or saw tooth type of cutting edge on the movable blade may be preferable and it will, of course, be appreciated that where desired the lower blade may be omitted and a shearing edge provided by the edge of the slot in the foot of the frame.

It will also be realized that for maximum cutting efficiency the adjacent sides of the stationary and movable blades should preferably be in flat face to face contact with each other and the cutting edges in close contact at the interconnection of these two edges. Thus during movement of the upper blade one cutting edge will "wipe" past the other. Accordingly, the replaceable blades are preferably provided with knife edges having a bevel formed on the outside edge only. Where blades with knife edges bevelled on both sides are used, the lower stationary blade may be suitably canted in the slot of the foot for contact at the intersecting edges.

What I claim is:

1. A hand portable cutting device for sheet materials and the like comprising a frame having a foot member and a shearing edge on the upper surface of the foot, a motor fixed to said frame in elevated relation to the foot and having an armature shaft positioned transversely thereof with crank means at the end of said shaft overlying said shearing edge in spaced relation thereto, a blade member having upper and lower ends with a cutting edge therebetween, said blade extending upwardly from below said shearing edge and at its lower end having a pivotal mounting connection on said foot underneath said shearing edge and at its opposite upper end being connected to said crank means for the application of driving movement of the blade at said upper end.

2. The structure of claim 1 in which said crank means comprises an eccentric drive pin member fixed on said armature shaft and a link pivotally connected at one end to said pin and at the other end to said upper end of the blade member.

3. The structure of claim 1 in which said crank means comprises an eccentric drive pin member fixed on said armature shaft, and said blade is pivotally connected at its upper end to said drive pin, the pivotal mounting of the lower end of said blade on the foot being a pin and slot connection.

4. The structure of claim 1 in which the motor is provided with a casing to one end of which the said frame is attached, said casing at the other end of the motor having a skid member attached thereto and depending in spaced parallel relation to said frame, said casing further having a rearwardly directed handle extending from the central portion thereof.

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