Jan. 14, 1969 R. A. THOMPSON 3,421,218

ELECTRIC SCISSORS

Filed Aug. 1, 1966 Sheet 1 of 2

FIG.1

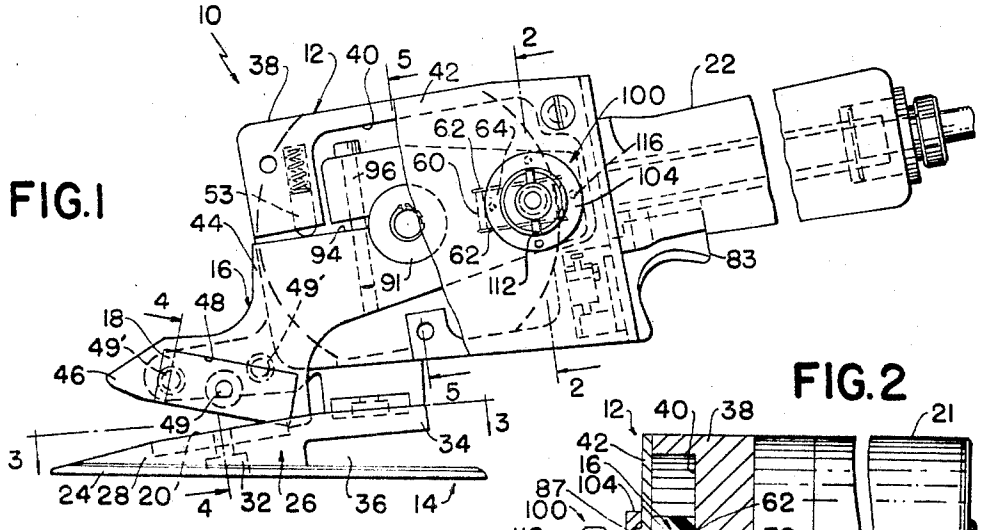


FIG.2

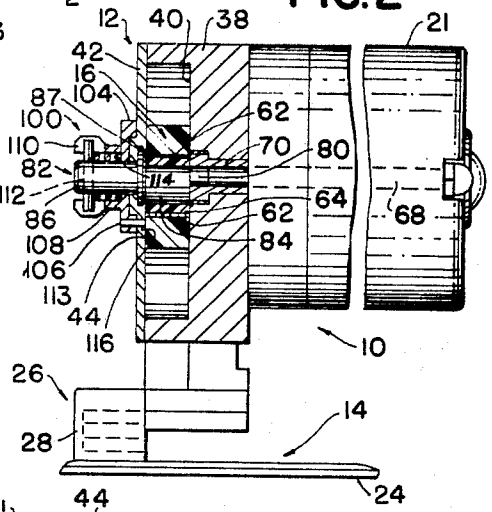


FIG.3

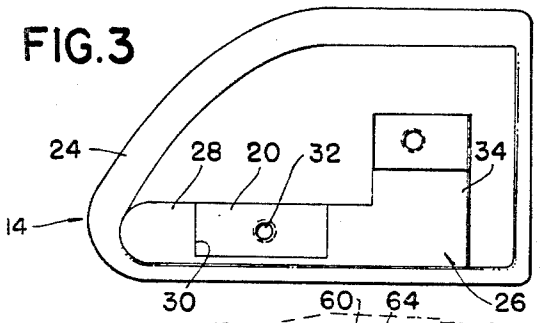


FIG.6

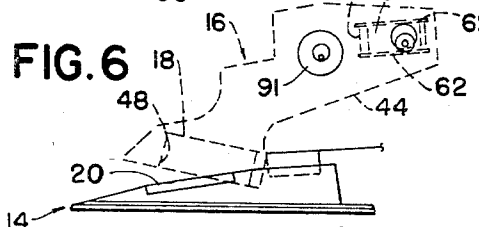


FIG.7

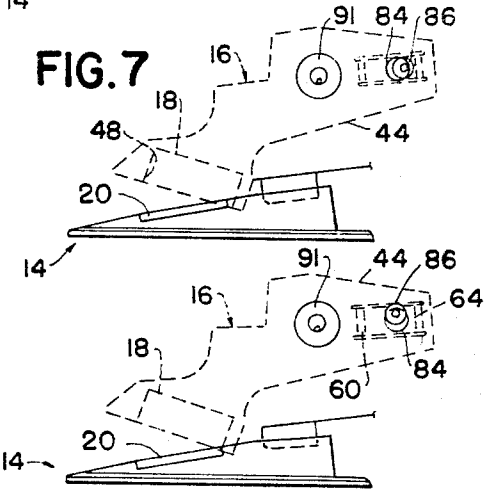


FIG.4

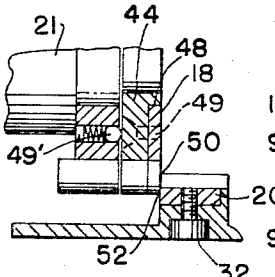


FIG.5

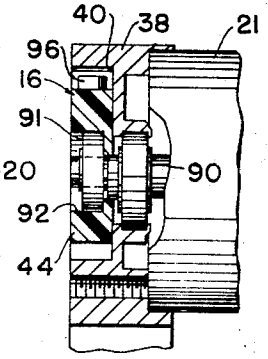


FIG.8

INVENTOR.
RICHARD A. THOMPSON

BY

Whittemore, Hulbert & Belknap

ATTORNEYS

Jan. 14, 1969 R. A. THOMPSON 3,421,218

ELECTRIC SCISSORS

Filed Aug. 1, 1966 Sheet 2 of 2

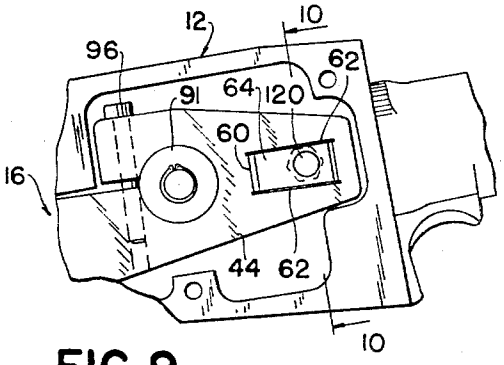


FIG. 9

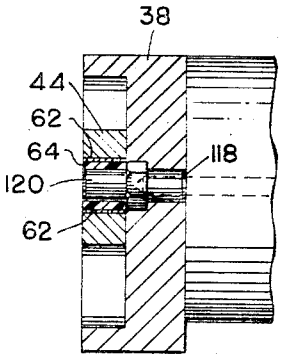


FIG. 10

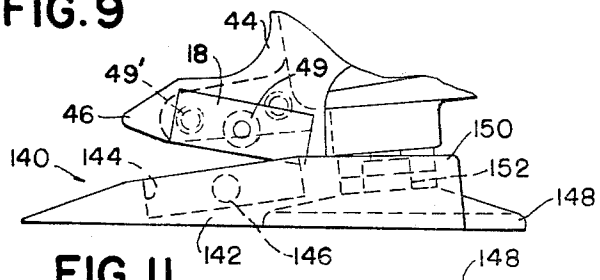


FIG. 11

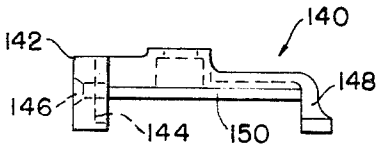


FIG. 12

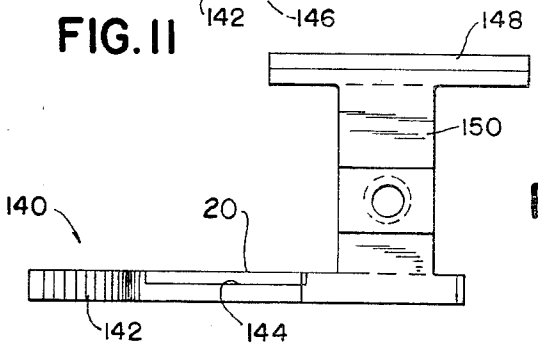


FIG. 13

INVENTOR.
RICHARD A. THOMPSON

BY
Whittemore, Hulbert & Belknap

ATTORNEYS

United States Patent Office 3,421,218
Patented Jan. 14, 1969

3,421,218

ELECTRIC SCISSORS

Richard A. Thompson, Detroit, Mich., assignor of forty-nine percent to Ben S. Stephenson, Birmingham, Mich.

Filed Aug. 1, 1966, Ser. No. 569,442
U.S. Cl. 30—228 7 Claims
Int. Cl. B26b *15/00*

ABSTRACT OF THE DISCLOSURE

The cutting device cuts fabric and like material and comprises a first blade mounted on a fixed base and a second blade mounted on an oscillatory member. The oscillatory member has a sliding pivotal connection so that the second blade moves in a generally elliptical orbit. The sliding pivotal connection includes an eccentric pivot shaft which may be rotated to vary the axis of pivotal movement. The base upon which the first blade is mounted provides a support for the device when placed upon a supporting surface. The blades are in the form of flat rectangular plates having four cutting edges and being individually invertable and reversible end-for-end so that the cutting V's can be formed by sixteen different combinations of cutting edges of the two blades.

This invention relates generally to cutting devices and refers more particularly to a device for cutting fabric and like material.

It is an essential object of this invention to provide an improved cutting device for fabric and like material which is safe and speedy in operation.

Another object of the invention is to provide such a device having a base and a housing, with a blade mounted on the base, an oscillatory member pivoted to the housing, and a second blade mounted on the oscillatory member and cooperable with the first-mentioned blade to cut through the material.

Another object is to provide a power-operated cutting device wherein the two blades have cutting edges which form a V, one of the blades being movable with a cutting action with respect to the other blade in a generally elliptical orbit having an outward component of movement relative to the V during the cutting stroke so as to prevent the material from being drawn in too rapidly and hence choking the cutting action, and also to provide a safer operation which will not endanger the hands and fingers of the operator.

Another object is to provide a cutting device in which the blades are each in the form of a flat rectangular plate, the blades being individually invertible and reversible end-for-end so as to present a large number of different combinations of cutting edges.

Another object is to provide a cutting device which is particularly adapted to make 90° turns in the material being cut without interference.

Another object is to provide a cutting device which can be used for trimming material close to the edges.

Another object is to provide a pivot for the oscillatory member carrying one of the blades which is adjustable so as to vary the position of the blades relative to one another and thus make maximum use of the cutting edges.

Another object is to provide a sliding pivotal connection between the housing and the oscillatory member carrying one of the blades so as to produce an orbital movement of that blade during cutting.

Another object is to provide an oscillatory member for supporting one of the blades which includes an arm to which the blade is secured and a block slidably mounted on the arm, and a pivot connection between the block and the housing, the pivot connection and block providing a slidable pivotal mounting for the oscillatory member.

Another object is to provide a cutting device which is composed of a relatively few simple parts and yet which is highly effective in the performance of its intended function.

Other objects and features of the invention will become apparent as the description proceeds, especially when taken in conjunction with the accompanying drawings, wherein:

FIGURE 1 is a side elevational view, with parts broken away, of a cutting device constructed in accordance with my invention.

FIGURE 2 is a sectional view taken on the line 2—2 in FIGURE 1.

FIGURE 3 is a view taken on the line 3—3 in FIGURE 1.

FIGURE 4 is a fragmentary sectional view taken on the line 4—4 in FIGURE 1.

FIGURE 5 is a fragmentary sectional view taken on the line 5—5 in FIGURE 1.

FIGURE 6 is a semi-diagrammatic view illustrating the parts of the cutting device in one position.

FIGURE 7 is similar to FIGURE 6 but shows the parts in a different position.

FIGURE 8 is similar to FIGURES 6 and 7 but shows the parts in still another position.

FIGURE 9 is a fragmentary side elevational view of the housing with the cover removed and showing a modification.

FIGURE 10 is a sectional view taken on the line 10—10 in FIGURE 9.

FIGURE 11 is a fragmentary side elevational view showing a further modification.

FIGURE 12 is an end view of the base of the structure shown in FIGURE 11.

FIGURE 13 is a top plan view of the base of the structure shown in FIGURE 11.

Referring now more particularly to the drawings, and especially to FIGURES 1–8, the cutting device there shown is generally designated by the numeral **10** and comprises a support or housing **12**, a base **14**, an oscillatory member **16**, blades **18** and **20** mounted on the oscillatory member and base respectively, electric motor **21** and the handle **22**.

The base **14** has a flat plate or pad **24** in the shape shown in FIGURE 3 and by which the device is supported on a flat surface when not in use. A blade and housing supporting structure **26** is secured to and projects upwardly from the plate **24**. This structure has a blade supporting portion **28** which is inclined upwardly and rearwardly from the front edge or toe of the plate. There is a shallow rectangular recess **30** in the top surface of portion **28** opening through the inner side edge thereof. This recess **30** receives the blade **20**. Blade **20** is in the form of a flat rectangular plate as shown and is removably secured in the recess **30** by fastener **32** so that its top surface is flush with the top of portion **28** and its inner edge is flush with the inner edge of portion **28**.

The structure **26** also has the housing supporting portion **34** which is spaced above the plate **24** to provide the recess **36** shown in FIGURE 1 which provides a clearance for the material when the cutter is turned at a right angle while cutting, without interference from the material.

The housing **12** comprises a block or casing **38** having a recess **40** in one side, and a cover **42** over the recessed side which is removably secured thereto by suitable fastening devices. The recess **40** provides a space within the housing for the oscillatory member **16**. The oscillatory member **16** comprises an arm **44** which is of the general outline shown in FIGURE 1 and has a portion **46** projecting through an opening in the front end of the housing

upon which the blade **18** is mounted. The portion **46** has a recess **48** in its outer surface which is of rectangular form, and the blade **18** is removably mounted in the recess by a fastener **49**. The outer surface of blade **18** is flush with the outer surface of portion **46**, and its bottom edge is flush with the bottom edge of portion **46**. The blade **18** is identical with blade **20**. The blade **18**, however, is disposed vertically when the device is placed on a horizontal supporting surface supported upon its base plate **24**. The blade **20** mounted on the base, on the other hand, is in a plane which is at right angles to the plane of the blade **18**.

Each blade has four cutting edges, only one of which is used in a cutting operation at any given time. As shown in FIGURES 1 and 3, the outer or open side of the blade **18** extends along the inner edge of the blade **20** so as to form a V. The adjacent edges of the blades have a sheaving action when the oscillatory member **16** moves up and down. Spring loaded balls **49'** in an extended portion of casing **38** press against the portion **46** of the arm **44** to maintain the blades in contact. A spring loaded plunger **53** in casing **38** presses down on arm **44** to increase the force of the cutting stroke. In the drawings, the cutting action takes place between the upper inner edge **50** of blade **20**, and the lower outer edge **52** of the blade **18**. Because of the removable mounting of the blades, they obviously may be inverted, and/or turned end-for-end so as to bring eight combinations of sixteen cutting edges into operative relation with one another. Accordingly, the device may be used for a very much longer period of time without replacing the blades.

The arm **44** has its main body portion disposed within the recess **40** in the housing. The rear end portion of the arm has a rectangular opening **60** lined top and bottom with metal plates **62**. A rectangular block **64**, shorter than opening **60**, is slidable within the opening, being guided by the plates **62**. The direction of sliding movement of the block is generally right and left as viewed in FIGURE 1. This block **64** is pivotally mounted to the housing in a manner which will now be described.

Referring to FIGURE 2, the motor **21** for operating the device is secured to the housing by suitable means including the motor stud **68**. The housing has a motor stud anchor nut **70** into which the motor stud **68** threads. The nut **70** has a smooth cylindrical internal portion which receives the reduced cylindrical end **80** of the adjustable pivot shaft **82**. This pivot shaft has an eccentric cylindrical portion **84**, an external cylindrical portion **86** concentric with the reduced portion **80** and a circular disc portion **87** also concentric with portion **80**. The disc portion **87** rotates in a recess on the inside of cover **42**. Normally the shaft **82** is locked in a given position of rotation by structure hereinafter described. The eccentric **84** passes through and pivotally supports the block **64**. Hence the block is pivotally mounted to the housing but has a slidable connection with the arm.

The arm **44** is oscillated about the pivot provided by eccentric **84** of shaft **82** by motor **21**. The trigger **83** is employed to start and stop the motor. Current to operate the motor is brought in by leads through the handle. The motor has an output shaft **90** journaled on the housing as indicated in FIGURE 5, and is provided with an eccentric **91** on its outer end which is rotatably received in a circular recess **92** formed in the arm **44** at a point spaced from pivot shaft **82**. The arm has a yoke formation surrounding the eccentric providing slot **94**, and is secured firmly upon the eccentric by a screw **96** threaded across the legs of the yoke.

When the motor **21** is operated the arm **44** will be oscillated through a limited arc about the pivot shaft **82** by the action of the eccentric **91** on the motor output shaft. The motor shaft and eccentric **91** rotate clockwise as viewed in FIGURE 1. This action causes the portion **46** of the arm to move up and down in FIGURE 1 to widen and narrow the V formed by the cutting edges of the blades. This is the cutting action necessary to cut through the fabric.

By reason of the sliding pivotal connection of the arm to the housing provided by the pivot shaft **82** and slidable block **64**, the arm **44** has an orbital movement rather than a simple arcuate movement. In other words, referring to FIGURE 1 the blade will move in a clockwise direction in a generally elliptical orbit. Accordingly, during the downward cutting movement of the blade **18** it will have a forward component, that is a component of movement to the left, so that while cutting the blade is moving outward with respect to the V. This will preclude any tendency of the blade to draw the material in too rapidly and to choke the device. This outward component of blade movement also protects the operator from having his fingers or hands drawn in should they happen to get in the way of the cutting action.

The shaft **82** may be rotated to adjust the eccentric and thereby alter the cutting action of the blades. Referring to FIGURES 1 and 2, an index knob **100** is mounted on the external portion **86** of shaft **82**. The enlarged disc portion **104** of the knob has a circular recess in its inner end which rotatably receives the circular embossment **106** on the outer face of cover **42**. The knob has a counterbore extending into the outer reduced finger portion **108**, and this finger portion is formed with diametrically opposite axial slots **110** which open through the outer end of the finger portion. A pin **112** is secured in a transverse hole in the external portion **86** of the shaft and its opposite ends lie within the slots **110**. A compression coil spring **114** is disposed within the counterbore in encircling relation to the external portion **86** of the shaft, being compressed between the pin **112** and the bottom of the counterbore so as to press the knob **100** to the right in FIGURE 2, or toward the cover plate **42**.

The disc portion **104** of the knob has a pin **113** projecting axially from the periphery thereof in an inward direction which is adapted to extend into any one of the four holes **116** in the cover plate **42** which are spaced 90° apart around the embossment **106**.

The eccentric pivot shaft **82** may be rotated to adjust the cutting action of the blade by withdrawing the index knob **100** to the left in FIGURE 2 to remove pin **112** from one of the holes **116**, and then rotating the knob **100** to align the pin **112** with another hole **116**. Shaft **82** rotates with the knob. The knob **100** may then be released to cause pin **112** to enter the aligned hole **116**. FIGURES 6, 7 and 8 show the parts of the cutting device in the various positions they will assume in different positions of adjustment of the eccentric shaft **82**. By comparing these figures, it will be seen that the portions of the cutting edges of the blades in contact with one another differ depending upon the adjustment of the eccentric shaft. Accordingly, the blades can be used for a much longer period of time so that maximum use of their cutting edges can be obtained before replacement.

FIGURES 9 and 10 disclose a modification of the invention in which the eccentric pivot shaft **82** is replaced by a concentric non-adjustable shaft **118**. The shaft **118** is secured in fixed position to the block **38** of the housing and has a concentric portion **120** which projects into the space within the housing and into a circular opening in the slide block **64** in which it is pivotally received. Accordingly, the pivot axis for the arm **44** is fixed and is not capable of adjustment.

FIGURES 11–13 show a further modification of the invention in which the base of the device is different from that shown in FIGURES 1–8. The base **140** has a vertical upright blade supporting portion **142**. This portion has in its vertical inner surface a rectangular recess **144** which is open along the inclined upper edge thereof. The blade **20** is disposed in the recess **144** having its inner surface flush with the inner surface of the blade supporting portion **142** and its upper edge flush with the upper edge of the blade supporting portion **142**. A fastener

146 removably secured blade 20 in recess 144. The upper inner edge of blade 20 cooperates with the lower outer edge of blade 18 in a cutting operation. The bottom surface of the blade supporting portion 142 is flat and horizontal so as to rest upon a supporting surface.

The base 140 also has a vertical upright leg 148 parallel to and laterally spaced from the blade supporting portion 142, the bottom surface of which is in the horizontal plane of the bottom surface of the blade supporting portion 142. Hence the device will be supported on a flat surface by the leg 148 and the bottom of supporting portion 142.

The blade supporting portion 142 and leg 148 are connected by the transverse horizontal housing supporting bridge portion 150. The housing is removably secured to this bridge portion 150 by the fastening means 152.

By reason of the relatively narrow construction of the blade supporting portion 142, and the vertical upright disposition of the blade 20, the device can get close to the margin of a rug or piece of carpeting, for example, for trimming purposes.

What I claim as my invention is:

1. A power operated device for cutting fabric and the like comprising a base, a housing on said base, a blade mounted on said base, an arm having a second blade mounted thereon, a block slidably mounted on said arm, pivot means pivotally mounting said block on said housing, said pivot means and block providing a sliding pivotal connection between said arm and said housing, power means for imparting a sliding pivotal movement to said arm including an electric motor mounted on said housing, said motor having an output shaft, said shaft having an eccentric engaging said arm at a point spaced from said pivot means, said blades having cutting edges forming a V, said second blade, upon sliding pivotal movement of said arm, moving with a cutting action in an elliptical orbit widening and narrowing the V and having an outward component of movement relative to the V upon narrowing the latter, said pivot means comprising a pivot shaft having a portion rotatably mounted on said housing, said pivot shaft having a second portion eccentric relative to the first-mentioned portion thereof and rotatably engaging said block to establish the pivot axis thereof, and means for rotating said pivot shaft.

2. The device defined in claim 1, wherein said rotating means comprises an index knob on the outside of said housing non-rotatably mounted on said first-mentioned portion of said pivot shaft, cooperating means on said knob and on said housing engageable to lock said knob in selected positions of rotation, said knob being axially slidable on said first-mentioned portion of said pivot shaft to disengage said cooperating means, and spring means urging said knob axially on said first-mentioned portion of said pivot shaft in a direction to engage said cooperating means.

3. A power operated device for cutting fabric material and the like comprising support structure, a first blade mounted in fixed position on said support structure, an oscillatory member, means slidably, pivotally mounting said oscillatory member on said support structure, a second blade mounted on said oscillatory member adjacent said first blade so that the cutting edges of said blades form a V, each blade being in the form of a flat rectangular plate having four cutting edges, means removably mounting said blades on said support structure and oscillatory member respectively so that said blades are adjacent one another and a cutting edge of one forms a cutting V with a cutting edge of the other, said blades being individually invertible and reversible end-for-end so that cutting V's can be formed by eight different combinations of sixteen cutting edges of the two blades, and power means mounted on said support structure for oscillating said oscillatory member so that said second blade moves in a generally elliptical orbit widening and narrowing the V and having an outward component of movement relative to the V upon narrowing of the latter.

4. A power operated device for cutting fabric material and the like comprising support structure, a first blade mounted in fixed position on said support structure, an oscillatory member, means slidably, pivotally mounting said oscillatory member on said support structure, said slidable pivotal mounting means including a pivot member which is adjustable to vary the axis thereof, a second blade mounted on said oscillatory member adjacent said first blade so that the cutting edges of said blades form a V, and power means mounted on said support structure for oscillating said oscillatory member so that said second blade moves in a generally elliptical orbit widening and narrowing the V and having an outward component of movement relative to the V upon narrowing of the latter.

5. A power operated device for cutting fabric material and the like comprising support structure, a first blade mounted in fixed position on said support structure, an oscillatory member, means slidably, pivotally mounting said oscillatory member on said support structure, said slidable, pivotal mounting means including a pivot shaft having a portion rotatably mounted on said support structure, said pivot shaft having a second portion eccentric relative to the first mentioned portion thereof and rotatably engaging said oscillatory member to establish the pivot axis thereof, means for rotating said pivot shaft, a second blade mounted on said oscillatory member adjacent said first blade so that the cutting edges of said blades form a V, and power means mounted on said support structure for oscillating said oscillatory member so that said second blade moves in a generally elliptical orbit widening and narrowing the V and having an outward component of movement relative to the V upon narrowing of the latter.

6. The device defined in claim 5, wherein said rotating means comprises an index knob on the outside of said support structure non-rotatably mounted on said first-mentioned portion of said pivot shaft, cooperating means on said knob and on said support structure engageable to lock said knob in selected positions of rotation, said knob being axially slidable on said first-mentioned portion of said pivot shaft to disengage said cooperating means.

7. A power operated device for cutting fabric material and the like comprising a support structure, a first blade removably mounted on said support structure, an oscillatory member pivotally mounted on said support structure, a second blade removably mounted on said oscillatory member in a position such that the cutting edges of said blades form a V, power means on said support structure for oscillating said oscillatory member causing said second blade to have a cutting motion relative to said first blade widening and narrowing the V to cut fabric material and the like, each blade being in the form of a flat rectangular plate having four cutting edges, said blades being individually invertible and reversible end-for-end so that cutting V's can be formed by eight different combinations of sixteen cutting edges of the two blades.

References Cited

UNITED STATES PATENTS

1,848,147	3/1932	Ungar	30—228
2,244,638	6/1941	Boardman	30—228 X
2,250,589	7/1941	Piccolo	30—247
2,454,728	11/1948	White	30—228 X
2,731,721	1/1956	Traurig	30—247 X
2,316,486	4/1943	Park	30—231
3,189,997	6/1965	Mount	30—247 X

ROBERT C. RIORDON, *Primary Examiner.*

J. C. PETERS, *Assistant Examiner.*

U.S. Cl. X.R.

30—238, 353