

Sept. 10, 1935.

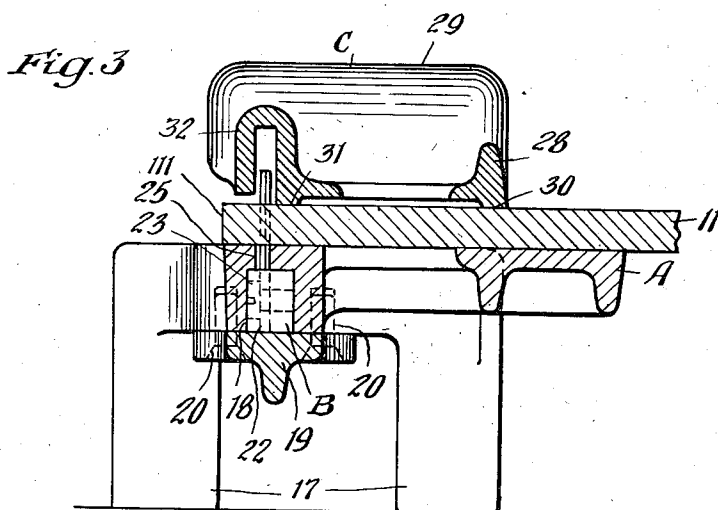
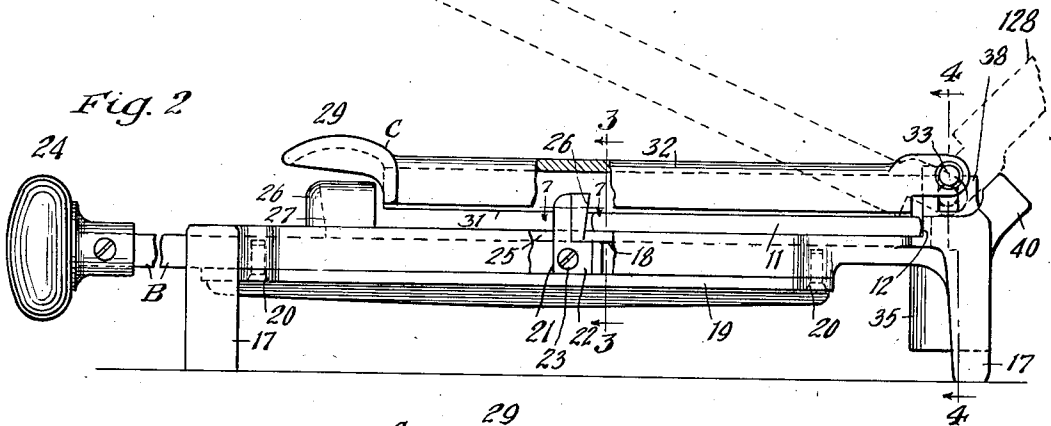
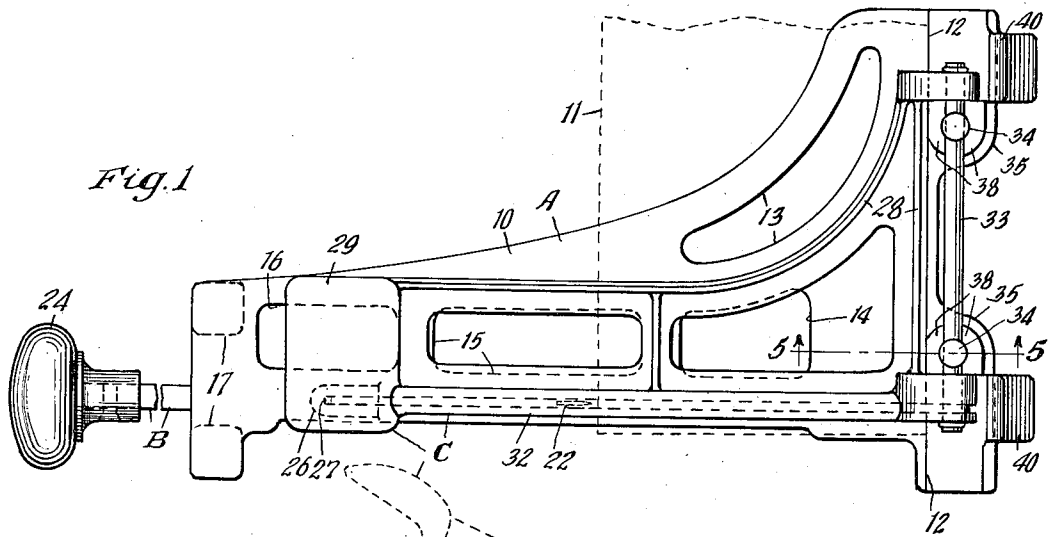
J. C. OLSEN

2,013,894

CUTTING DEVICE

Filed Aug. 2, 1934

2 Sheets-Sheet 1



Inventor
John C. Olsen

By Joseph Harris
His Atty.

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Fig. 4

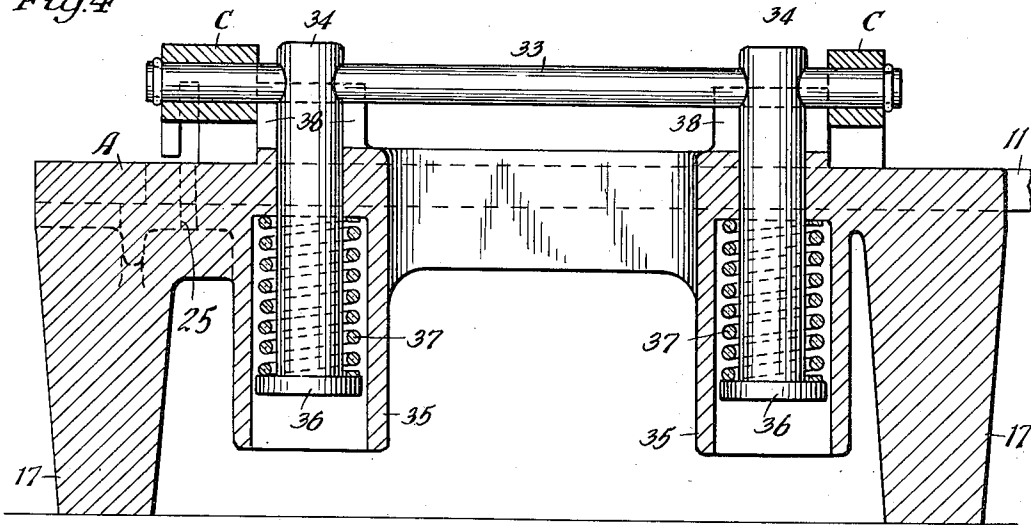


Fig. 5

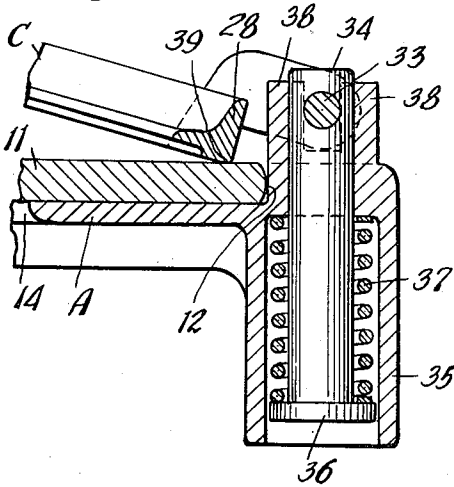


Fig. 6

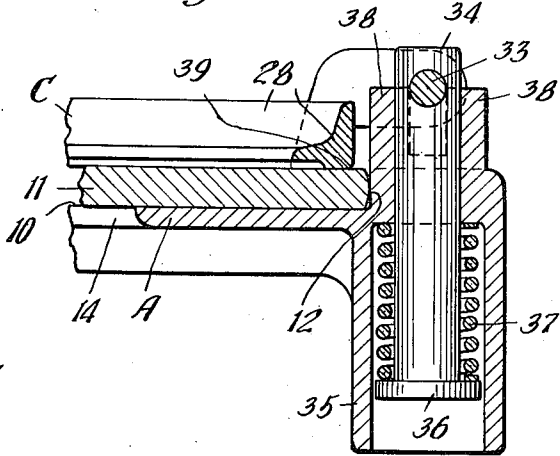
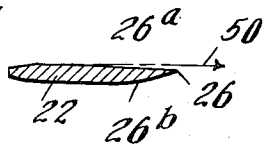


Fig. 7



Inventor
John C. Olsen
By Joseph Harris
his Atty.

UNITED STATES PATENT OFFICE

2,013,894

CUTTING DEVICE

John C. Olsen, Chicago, Ill., assignor to Flexible Steel Lacing Company, Chicago, Ill., a corporation of Illinois

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8 Claims. (Cl. 164—73)

This invention relates to improvements in cutting device, and more particularly a portable hand operated device for cutting sheet material such as leather and canvas belting, rubber strips, linoleum and the like.

One object of the invention is to provide a cutting device of the character indicated which is efficient in its cutting operation, is comprised of relatively few parts of simple and inexpensive construction to manufacture and easily assembled.

Another object of the invention is to provide a hand operated cutting device wherein the material, while being cut, is firmly held against shifting so as to insure a true cut and wherein the hold-down or clamping device is held by the operator in such manner that the greater the force exerted by one hand to effect the cutting of the material, the more pressure will naturally be exerted by the other hand of the operator in holding the material in place.

A further object of the invention is to provide, in a cutting device of the character indicated, a clamping or hold-down device for the material such that it will both readily and automatically accommodate itself to material of different thicknesses and, during the clamping or gripping action, will automatically push or "crowd" the material firmly against the abutment which determines the alignment of the material so as to insure a true cut at exactly 90° to the gauged edge of the material.

A still further object of the invention is to combine with the hold-down or clamping device, a guard for the knife so as to prevent possibility of injury to the operator.

Other objects of the invention will more clearly appear from the description and claims hereinafter following.

In the drawings forming a part of this specification, Figure 1 is a top plan view of a cutting device embodying the improvements. Figure 2 is a side elevation of the structure shown in Figure 1, parts being broken away to more clearly illustrate the knife and the hold-down device being also shown in dotted position corresponding to that of the first instant of engagement with the material. Figure 3 is a vertical sectional view, upon an enlarged scale, corresponding to the section line 3—3 of Figure 2. Figure 4 is an enlarged vertical sectional view corresponding to the section line 4—4 of Figure 2. Figures 5 and 6 are detailed vertical sectional views corresponding to the section line 5—5 of Figure 1, illustrating two positions of the clamping device and as-

sociated parts. Figure 7 is a horizontal sectional view, enlarged, of the knife and corresponding substantially to the line 7—7 of Figure 2.

In said drawings, the cutting device comprises, broadly, a main frame A; a knife carrying slide B; and a hold-down or clamping device C.

The main supporting frame A is of more or less triangular outline in top plan as shown in Figure 1 and is provided with a smooth, flat, horizontal supporting surface 10 for the piece of belting or other material to be cut indicated in dotted lines at 11 in Figure 1.

On its wider side, the frame A is provided with a rectilinear abutment or gauging shoulder 12 of appreciable extent and against which the side edge of the material is to be cut is placed to determine its position, as will be evident. To lighten the structure and reduce the amount of metal required, the main frame A is preferably cored or recessed, as indicated at 13, 14, 15 and 16. The frame is provided at the several corners thereof with substantial preferably solid depending supporting legs 17 so that the same may be placed upon a table, bench or the like, when being used.

Adjacent its longest side, the supporting frame A is provided with a transversely extending non-circular and preferably rectangular channel or guiding recess 18 which is opened at the left-hand end of the device as viewed in Figures 1 and 2. Said channel or recess 18 is adapted to be closed by a bottom removable plate 19 held in place by suitable machine screws 20—20, thus completing a rectangular guideway extending substantially entirely across the supporting frame, for the knife carrying guide or operating member B which is of corresponding cross section.

Said operating member B, of solid rectangular cross section, having a close sliding fit within the guide channel, is preferably recessed at its inner end, as indicated at 21, on the side nearest the side edge of the frame A, and within which recess or notch is secured the lower end 22 of the knife, by means of set-screw 23. The operating member B is provided with any suitable hand grip, such as the knob 24, as shown, to adapt the same to be pushed or pulled, as will be apparent.

Communicating with the guide channel 18 and extending up through the supporting surface of the frame A, is slot 25, through which is upwardly extended the cutting portion 26 of the knife so that the latter is adapted to engage and sever material held on the supporting frame. At the lefthand end of the slot 25, as viewed in Figure 2, the main frame A is provided with an upstand-

ing rounded housing 26 suitably interiorly slotted as indicated at 27 and in which the cutting section 26 of the knife is housed and protected when drawn to its extreme left position, as viewed in Figure 2.

Referring next to the clamping device C, the same, as shown, comprises a main clamping or hold-down arm 28 having at its outer free end, a rounded hand hold-down 29 which, when the clamping device is in operative position, extends over the knife housing 26, as clearly shown in Figure 2. The arm 28 is made of skeleton form and is widened out at its pivoted end or right-hand end as viewed in Figure 1 and, on its under side, is formed with flat clamping surfaces 30 and 31 which conform substantially to the outlines of the arm except for the hold-down knob 29. As clear from Figure 3, that portion of the hold-down surface, referenced 31, extends parallel to and closely adjacent the line of travel of the knife so as to positively insure the belt material 11 or the like being firmly clamped immediately adjacent the slot in the supporting surface on that side of the knife corresponding to the main body of the material being cut. The hold-down arm is also formed with a guard of inverted U section, as indicated at 32, along that edge overlying the path of movement of the knife so as to at all times protect the operator against the possibility of being cut by the knife. In this connection it will be noted that the outer side of the guard section 32 does not come down low enough to engage the material, so that that portion 111 of the material which is to be severed or trimmed off, is not clamped but is free to be pushed out or away from the main body of the material during the cutting action and also that said portion 111 to be severed, is at all times supported on the outer side of the knife slot so as to prevent it from bending down and hence distorting the cut.

At its inner or wide end, the arm 28 is pivotally attached to a pin 33 which in turn is carried by two spaced spring controlled plungers 34—34 extending down through the bed of the main casting A within two integrally formed sleeves or housings 35—35. Each of the plungers 34 is flanged or headed at its lower end as indicated at 36, which operates as a follower for a relatively heavy coil spring 37 encircling the plunger, the upper end of the spring being seated against the main frame A as clearly shown in Figures 4, 5 and 6. The frame A, above the guide shoulder 12, is formed with upstanding integral guides 38—38 for the pivot pin 33 and plungers 34 so as to insure a true straight up and down movement of the pivoted end of the clamping arm. The springs 37 are normally under compression so as to pull the inner pivoted end of the clamping arm down to its lowermost position but, as will be apparent, the arrangement is such as to permit the upward yielding of the inner pivoted end of the clamping arm to accommodate itself automatically to different thicknesses of the material 11 being cut.

Referring now more particularly to Figures 5 and 6, it will be noted that the pivotal axis of the clamping arm 28 is disposed outwardly of the shoulder 12 and an appreciable distance above the supporting surface of the main frame A and that this axis will normally rise during the clamping action of the arm on the belt or other material. Along its inner or pivoted edge, the clamping arm 28 is provided with a rounded engaging edge surface 39. It will also be noted that said rounded edge 39 is laterally offset to one side of a line or plane passing vertically through the axis

of the pivot pin 33, that is, laterally offset with respect to a plane passing through said axis normal to both the clamping and supporting surfaces. As clearly shown in Figure 5 where the clamping arm is initially engaging the piece of material 11 to be cut, the point of initial engagement is at a greater distance from the abutment 12 than when it reaches its final position as shown in Figure 6. During the change of position of the engaging rounded edge 39 from that shown in Figure 5 to that shown in Figure 6, said rounded or camming edge exerts a combined clamping and pushing action toward the right or gauging shoulder 12, thus automatically serving to push and crowd the material 11 up solidly against the shoulder 12. As will be apparent, this not only insures that the material will be held down firmly against the supporting surface but also that it will be maintained firmly against the abutment 12 so as to maintain the material true with reference to the path of movement of the knife during the cutting action.

The main frame A is also preferably provided with upwardly and outwardly inclined lugs 40—40 adjacent the pivots of the clamping arm so that the latter may be temporarily supported in inoperative position as indicated by the dotted lines 128 in Figure 2.

In cutting or trimming the material, the same is done by pushing the knife from left to right as viewed in Figure 2, that is by forcing the knife toward the abutment 12. Normally, the operator will employ his right hand to push the knob 24 and his left hand on the hold-down knob 29 of the clamping arm, and as greater pressure is exerted in pushing the knife through the material, the operator will naturally exert a correspondingly greater downward pressure with his left hand in clamping the material. At all times, it will be noted the operator is fully protected against injury from the knife.

Referring now more particularly to the knife, which is of special construction, the active cutting part may be described as of generally thin flat character. The side 26a, which is adjacent the main portion of the material being cut, is disposed in a plane making a very slight angle with the line of motion of the knife, which line of motion is indicated at 50. The other or outer side 26b of the knife is formed with a slightly curved surface extending at a relatively greater angle to the line of movement of the knife as clearly shown in Figure 7. At the rear, both sides of the knife converge slightly, as shown. By inclining both of the surfaces 26a and 26b from the line of rectilinear movement of the knife and diverging them as described and shown and then converging the rear portions of the surfaces, so as to make the thickest portion of the knife intermediate the front and rear edges thereof, the amount of force required to push the knife through a piece of material of given thickness and characteristics is very substantially lessened as compared with prior types of knives having a similar purpose. Experience has also demonstrated that a knife having the characteristics described, will make an absolutely straight cut across the full width of the material without any tendency to draw or push the material transversely to the line of cut as the knife progresses therethrough, which has been a fault of prior constructions. Furthermore, by supporting that portion of the material which is being severed on the outer side of the knife, the cut remains

a true vertical cut and without danger of the cut edge being beveled.

Although what is now considered the preferred embodiment of the invention has herein been shown and described, the same is by way of illustration and not by way of limitation, since it is evident that various changes and modifications may be made without departing from the spirit of the invention. All changes and modifications are contemplated that come within the scope of the claims appended hereto.

What is claimed is:

1. In a cutter of the character described, a main frame having a supporting surface and a gauge abutment along one side thereof; a knife rectilinearly movably mounted on said frame toward and from said abutment; and a clamping arm pivotally mounted on said frame, the axis of the pivotal mounting being disposed parallel to and outwardly of said abutment, said clamping arm having a material-engaging edge also parallel to the abutment but on the inner side thereof, said edge being adapted to initially engage the material and urge the latter toward the abutment as it is moved down to operative position.

2. In a cutter of the character described, a main frame having a supporting surface and provided with a gauge abutment along one side thereof; a knife rectilinearly movably mounted on said frame at right angles to said abutment; and a clamping arm having a yielding pivotal support on said main frame, the axis of the pivotal support extending parallel to said abutment and located above said supporting surface.

3. In a cutter for relatively stiff materials such as leather, a main frame having a flat supporting surface and a gauging abutment along one side thereof; a rectilinearly movable knife projecting above said surface and movable toward and from said abutment, and a combined clamp and knife guard member pivotally attached at one of its ends to said frame, said member having a clamping surface located adjacent one side of the path of movement of the knife and a substantially inverted U section extending upwardly therefrom and over the path of movement of the knife, the depending free edge of the outer side of said U section being disposed in a higher plane than said clamping surface whereby the portion of the material to be severed from the main body of the material, remains supported but unclamped during the cutting operation.

4. In a cutting device, a main frame having a supporting surface and provided with a gauge abutment along one side thereof and a slot adjacent but inwardly of another edge thereof, said slot extending at right angles to the abutment; a knife slidably mounted on said frame and extending up through said slot; a knife housing at the outer end of said slot and rigidly associated with said main frame; and a clamping arm, the latter having a clamping surface, a knife guard positioned over the slot and a pressure knob at its free end; and means for pivotally attaching said arm to the frame.

5. In a cutter for belting and the like, the combination with a frame having a flat support-

ing surface with a gauge abutment along one edge thereof and a slot extending at right angles to said abutment; an operating bar slidably mounted on the frame below said slot; a knife carried by said bar and extending upwardly through the slot; a housing fixed with respect to said frame and disposed above said supporting surface, for the knife at the end of the slot remote from the abutment; a combined knife guard and clamp member; and means pivotally attaching the same to the frame, said means including a pivot pin extending parallel to the abutment and spring controlled supports for said pin.

6. In a material cutting device of the character described, the combination with a main frame having a flat supporting surface for the material to be cut; of a gauging abutment along one side of said supporting surface; a cutting element; a clamping element for the material having a flat clamping face and a camming edge paralleling said abutment; pressure applying means for said clamping element; an adjustable pivotal supporting and attaching means for said clamping element to the main frame, the axis of the pivotal attaching means being disposed an appreciable distance above the plane of said clamping face when the clamping element is in operative engagement with the material, and said camming edge being laterally offset from said axis.

7. In a cutter of the character described, a frame having a supporting surface for the material to be cut; cutting means rectilinearly movably mounted and guided on said frame to sever material supported on said surface; an element having a clamping face arranged to engage the material; means for applying manual pressure to said element; and pivoted supporting means for said element and pressure means on the frame, the axis of said pivoted means being located an appreciable distance above the plane of said clamping face when said element is in operative clamping engagement with the material and the edge of said clamping face which is nearest said pivotal supporting means, being also laterally offset to one side of a line passing through said axis normal to the clamping and supporting surfaces.

8. In a cutter of the character described, a frame having a supporting surface for the material to be cut; a knife rectilinearly movably mounted on said frame to sever material supported on said surface; a clamping element having a flat clamping face; manual pressure applying means for said clamping element; and yieldably mounted pivotal supporting means for said element and pressure means, the axis of said pivotal means being disposed an appreciable distance above the plane of said element clamping face when the latter is in operative clamping engagement with the material, the edge of said clamping face nearest said pivotal supporting means, being also laterally offset to one side of a line passing through said axis normal to the clamping and supporting surfaces.

JOHN C. OLSEN.