Aug. 28, 1956 M. DRAENERT 2,760,265

CUTTING TOOL

Filed May 19, 1953 2 Sheets-Sheet 1

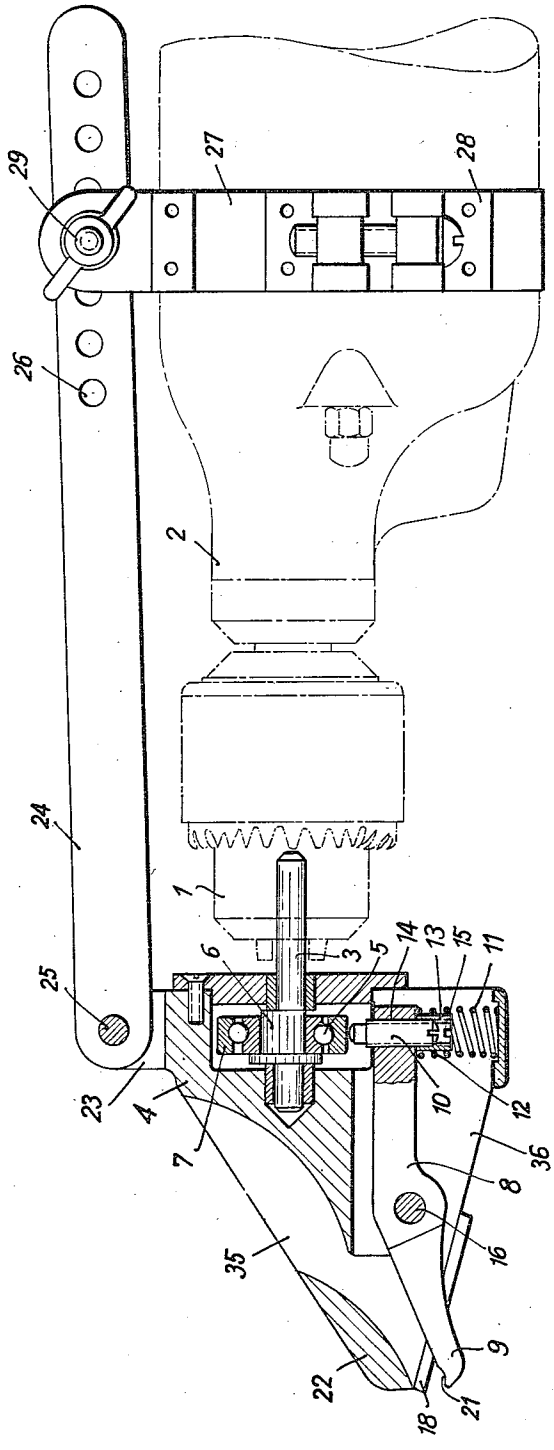


Fig. 1

INVENTOR:
MAX DRAENERT
BY:

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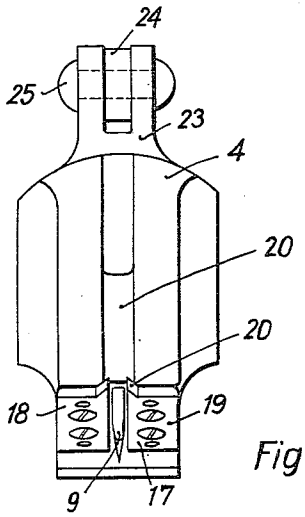


Fig. 2

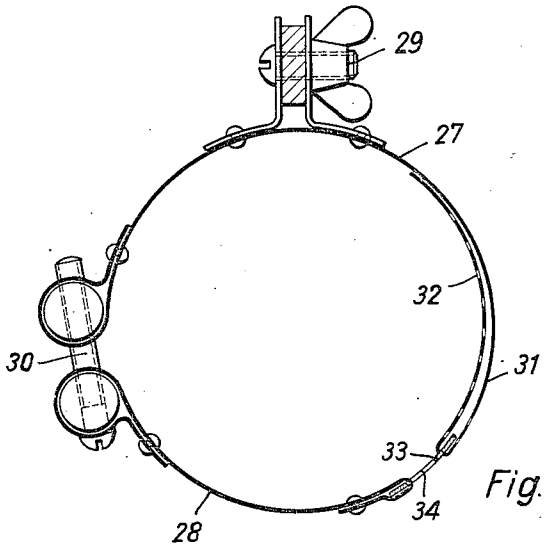


Fig. 3

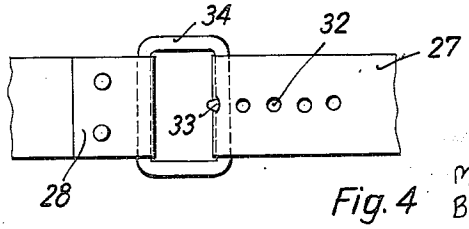


Fig. 4

INVENTOR
MAX DRAENERT
BY:

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CUTTING TOOL

Max Draenert, Reichenbach (Fils), Wurttemberg, Germany

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11 Claims. (Cl. 30—241)

The invention is concerned with cutting tools and more especially with power actuated cutting tools for cutting light sheet material such as sheet metal, cardboard, artificial products, leather or the like.

It is the main object of this invention to provide a cutting tool of the general character described which makes it possible to sever the material to be cut without deforming it and without leaving burrs or ripples along the severed edges.

Another specific object of this invention is to provide a cutting tool which during operation cuts out narrow strips of material so that no deformation of the material to be cut can take place.

Yet another object of the invention is to provide a cutting tool which enables the operator to perform his job with absolute accuracy.

A still further object of the invention is to provide a cutting tool easy to handle and reliable in service and which, moreover, can be driven by practically any size of drill.

With these and other objects in view, which will appear as the description proceeds, the invention consists of certain novel features of construction as will be particularly pointed out in the appended claims.

The manner of carrying the invention into effect is hereinafter described by way of example, reference being had to the accompanying drawings in which:

Fig. 1 is a sectional side view of a cutting tool embodying the invention,

Fig. 2 is a front view thereof, certain details of the tool having been eliminated in order to more clearly show essential operating parts,

Fig. 3 is a front view of the clamping band serving to connect the cutting tool to an electrically driven hand drill, and

Fig. 4 is a plan view of a part of the clamping band.

Referring more particularly to the drawing, 1 designates a rotating chuck fixed on the electrically driven hand drill 2 and serving to clamp the driving shaft 3 which projects from the body 4 of the cutter head. The shaft 3 carries an eccentric 6 upon which there is fixed the inner race of the ball bearing 5, the non rotating outer race of which serves to transmit the oscillatory motion of the eccentric 6 to the lever 8 through the agency of a cam follower screw 10 screwed to the lever 8, and disposed rectangularly to the longitudinal axis of the latter. The body 4 is formed with a substantially longitudinally disposed slot 36 and a slot 35 directed upwardly therefrom and communicating with said longitudinally disposed slot 36. The lever 8, which is accommodate in said longitudinally disposed slot 36, is pivoted to the body 4 of the cutter head by means of a pin or bolt 16, and carries on its free end a cutting blade 9. The end 12 of the compression spring 11 arranged coaxially with the screw 10 bears against the lever 8 and surrounds a sleeve 13 which is mounted upon the lever 8 coaxially with the tapped hole 14 serving for the reception of the screw 10, and which has a correspondingly

shaped and arranged hole 15 for the reception of the screw head. Thus, the operative motion of the cutting blade is generated by the drive of the cutting tool, whereas the return stroke takes place under the action of the compression spring 11.

The two lateral edges of the cutting blade 9 serve as movable blades and the corresponding stationary blades are constituted by the sides 18 and 19 of the slot of a die member 17 so affixed by means of screws or the like to the body 4 that the slot of the die member 17 registers with the slot 36 of the body 4. The sides 18 and 19 of the die member slot, between which the cutting blade 9 rockingly moves when in operation, are made of hardened steel or other suitable material adapted to enhance the cutting properties of the tool. Each of the sides 18 and 19 is provided with a triangular projection 20 the apex of which points in longitudinal direction. The two projections 20 constitute a contrivance for taking aim which enables the operator to exactly follow the mark or guide line on the work to be cut by watching that either the projection of the side 18 or that of the side 19 coincide therewith.

In order to prevent the material to be cut from gliding off the cutting blade 9, a depression 21 is ground away from the cutting face of the blade 9 for obtaining the appropriate cutting angle. The two sides 18 and 19 of the die member 17 may be put one in the other's place after having been reversed about an angle of 180 deg. so that it is possible to use the die member 17 a long time without regrinding. When the cutting blade 9 has been reground, it may be adjusted to the initial cutting depth by means of the screw 10. The cutting blade 9 may be, if desired, relief ground on the sides thereof (not shown) to facilitate curve cutting. By thus providing a slight clearance where the blade contacts the material, a curved cut, say for example with a radius of 2 in., can be made more readily as it allows the blade to be moved sidewise slightly to guide the same along a curve.

Above the die member 17 there is provided a chip guide member 22 by means of which a positive carrying off of the chips is ensured. The chip guide member 22 is affixed to the body 4 at the point where the slots 35 and 36 communicate, and turns the chips upwardly leading them into the slot 35.

A fork-shaped member 23 is connected with the upper part of the body 4 of the cutter head, to which member 23 a holder bar 24 is pivoted by means of a pin or bolt 25. The bar 24 is provided at its free end with a series of holes 26 in one of which a clamping band 27, 28 may be fixed at will by means of a screw 29.

The clamping band 27, 28 consisting of a top part 27 and of a bottom part 28 is laid around the hand drill 2, a screw 30 serving to tightly connect the two parts 27 and 28 together. The end 31 of the part 27 of the clampinb band is provided with a plurality of holes 32 into one of which a nose 33 of a latch 34 enters, the latter being fixedly connected to the part 28 of the clamping band. Thus, it is possible to adapt the clamping means constituted by said clamping band 27, 28 to different hand drill diameters.

The foregoing description is directed solely towards the constructions illustrated, but I desire it to be understood that I reserve the privilege of resorting to all mechanical changes to which the device is susceptible, the invention being defined and limited only by the terms of the appended claims.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent is:

1. A cutting tool comprising a body with a lower face having a substantially longitudinally disposed slot the sides of which constitute two stationary blades, a movable double-edged cutting blade interposed there-

between and pivotally mounted in said longitudinally disposed slot for cooperation with said stationary blades, said movable cutting blade having a tail portion extending along said body and carrying a cam follower, a power-actuatable shaft rotatably mounted in said body and having an eccentric fixedly connected therewith, a ball bearing the inner race of which surrounds said eccentric and is fixed thereon, and the non rotating outer race of which bears against said cam follower, a compression spring interposed between a wall of said body of said cutting tool and the tail portion of said cutting blade where said cam follower is situated, and arranged coaxially therewith, said compression spring serving to urge said cam follower against said outer race of said ball bearing, means for carrying off the chips produced when cutting with said cutting tool, and means on said cutting tool for attaching said tool to a power source.

2. A cutting tool comprising a body with a lower face having a substantially longitudinally disposed slot the sides of which constitute two stationary blades, a movable double-edged cutting blade interposed therebetween and pivotally mounted in said longitudinally disposed slot for cooperation with said stationary blades, said movable cutting blade having a tail portion extending along said body into which a cam follower screw is adjustably screwed, a power-actuatable shaft rotatably mounted in said body and having an eccentric fixedly connected therewith, a ball bearing the inner race of which surrounds said eccentric and is fixed thereon, and the non rotating outer race of which bears against the top of said cam follower screw, a compression spring interposed between a wall of said body of said cutting tool and the tail portion of said cutting blade where the head of said cam follower screw is situated, and arranged coaxially therewith, said compression spring serving to urge said cam follower screw against said outer race of said ball bearing, means for carrying off the chips produced when cutting with said cutting tool, and means on said cutting tool for attaching said tool to a power source.

3. A cutting tool comprising a body with a lower face having a substantially longitudinally disposed slot the sides of which constitute two stationary blades, a movable double-edged cutting blade interposed therebetween and pivotally mounted in said longitudinally disposed slot for cooperation with said stationary blades, said movable cutting blade having a tail portion extending along said body into which a cam follower screw is adjustably screwed, a power-actuatable shaft rotatably mounted in said body and having an eccentric fixedly connected therewith, a ball bearing the inner race of which surrounds said eccentric and is fixed thereon, and the non rotating outer race of which bears against the top of said cam follower screw, a compression spring interposed between a wall of said body of said cutting tool and the tail portion of said cutting blade, said compression spring surrounding with its free end a sleeve mounted upon said tail portion coaxially with the tapped hole serving to receive said cam follower screw, said compression spring serving to urge said cam follower screw against said outer race of said ball bearing, means for carrying off the chips produced when cutting with said cutting tool, and means on said cutting tool for attaching said tool to a power source.

4. A cutting tool, comprising, in combination, a body including stationary blade means; a movable cutting blade pivotally mounted on said body for cooperation with said stationary blade means, said movable cutting blade having a tail portion; a power-actuatable shaft rotatably mounted in said body and having an eccentric means fixedly connected therewith; a cam follower means fixed on said tail portion of said pivoted cutting blade and being located opposite said eccentric means; and a spring means interposed between a portion of said body and said tail portion of said cutting blade where said cam follower means is located, and arranged coaxially therewith, said spring means urging said cam follower means against said eccentric means so that said pivoted cutting blade is reciprocated during rotation of said shaft end of said eccentric means.

5. A cutting tool, comprising, in combination, a body including stationary blade means; a movable cutting blade pivotally mounted on said body for cooperation with said stationary blade means, said movable cutting blade having a tail portion; a power-actuatable shaft rotatably mounted in said body and having an eccentric means fixedly connected therewith; an anti-friction bearing having an inner race surrounding said eccentric means and being fixed thereto and having a non-rotating outer race; a cam follower means fixed on said tail portion of said pivoted cutting blade and engaging said outer race of said anti-friction bearing; a spring means interposed between a portion of said body and said tail portion of said cutting blade where said cam follower means is located, and arranged coaxially therewith, said spring means urging said cam follower means against said outer race so that said pivoted cutting blade is reciprocated during rotation of said shaft and of said eccentric means; and means on said cutting tool for attaching said tool to a power source.

6. A cutting tool comprising, in combination, a body including stationary blade means; a movable cutting blade pivotally mounted on said body for cooperation with said stationary blade means, said movable cutting blade having a tail portion; a power-actuatable shaft rotatably mounted in said body; eccentric means fixedly connected to said shaft; a cam follower screw adjustably screwed into the tail portion of said pivotable cutting blade and being located opposite said eccentric means; and spring means interposed between a portion of said body and said tail portion of said cutting blade in the region of said cam follower screw and co-axially therewith, said spring means urging said cam follower against said eccentric means so that said pivoted cutting blade is reciprocated during the rotation of the shaft and of said eccentric means.

7. A cutting tool, comprising, in combination, a body having a lower face and an upper face, said body being formed with a substantially longitudinal first slot extending from the lower face thereof into said body and with a substantially longitudinal second slot extending from the upper face thereof into said body, said second slot having a bottom face, said slots being inclined towards each other and communicating with each other at one end of said body, the sides of said first slot constituting two stationary blades; a movable cutting blade located substantially within said first slot and being pivotally mounted on said body for cooperation with said stationary blades, said movable cutting blade having a tail portion; a power-actuatable shaft rotatably mounted in said body on the other end thereof and having an eccentric means fixedly connected therewith; a cam follower means fixed on said tail portion of said pivoted cutting blade and being located opposite said eccentric means; spring means interposed between said body and said tail portion of said cutting where said cam follower means is located, and arranged coaxially therewith, said spring means urging said cam follower means against said eccentric means so that said cutting blade is reciprocated during rotation of said shaft and said eccentric means; and a chip guide member fixed to said body and located in said second slot at said one end of said body and having an inner guide face extending from said one end of said body toward said top face of said body for guiding chips along said guide face and said bottom face away from said first slot.

8. A cutting tool, comprising, in combination, a body including stationary blade means; a movable cutting blade pivotally mounted on said body for cooperation with said stationary blade means, said movable cutting blade having a tail portion; a power-actuatable shaft rotatably mounted in said body and having an eccentric means fixedly connected therewith; an anti-friction bearing having an inner

race surrounding said eccentric means and being fixed thereto and having a non-rotating outer race; a cam follower means fixed on said tail portion of said pivoted cutting blade and engaging said outer race of said anti-friction bearing; and a spring means interposed between a portion of said body and said tail portion of said cutting blade where said cam follower means is located, and arranged coaxially therewith, said spring means urging said cam follower means against said outer race so that said pivoted cutting blade is reciprocated during rotation of said shaft and of said eccentric means.

9. A cutting tool as defined in claim 4, wherein said stationary blade means are a pair of transversely spaced blades cooperating with said cutting blade, each of said blades having a bottom face, a front face, and an inner face facing said cutting blade; and a pair of wedge-shaped projections respectively integral projecting from the front faces of said blades, said projections having inner faces flush with the inner face of the respective blade and a bottom face flush with the bottom face of the respective blade.

10. A cutting tool as defined in claim 5 wherein said means for attaching said tool to a power source include a supporting member pivoted to the tool on an axis transverse to the axis of said power-actuatable shaft, and clamping means movably carried by said member for securing said power source to the tool.

11. A cutting tool, comprising a body with a lower face having a substantially longitudinally disposed slot extending from the lower face into said body; a die member fixed to said lower face of said body and having a slot registering with said longitudinally disposed slot of said body, said die member having two side parts having cutting edges and being adapted to be exchanged with each other after having been reversed by turning through an angle of substantially 180°; a movable double-edged cutting blade

interposed between said side parts of said die member and pivotally mounted in said longitudinally disposed slot of said body for cooperation with said die member; a power-actuated shaft rotatably mounted in said body and having an eccentric fixedly connected therewith, a ball bearing the inner race of which surrounds said eccentric and is fixed thereon, and the non-rotating outer race of which bears against said cam follower, a spring interposed between a wall of said body of said cutting tool and said cutting blade for urging said cam follower against said outer race of said ball bearing, means for carrying off the chips produced when cutting with said cutting tool, and attaching means on said cutting tool for attaching said tool to a power source.

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