

L. PAINCHAUD.
CUTTING DIE.
APPLICATION FILED OCT. 25, 1909.

1,030,529.

Patented June 25, 1912.

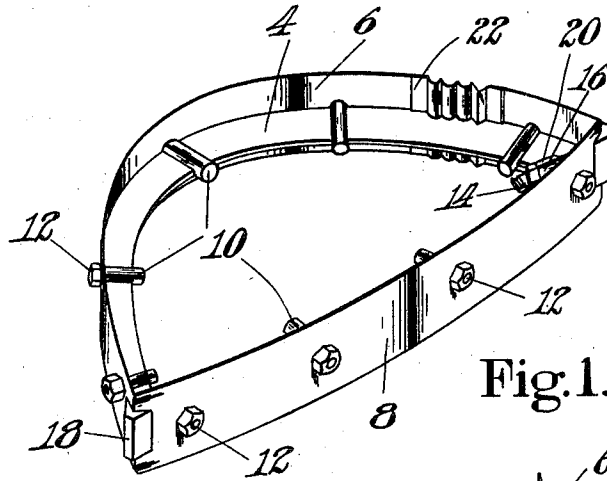


Fig. 1.

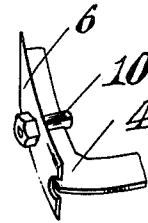


Fig. 2.

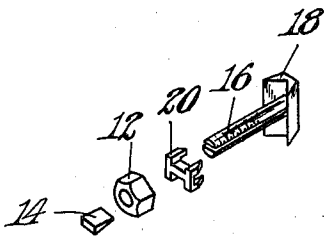


Fig. 3.

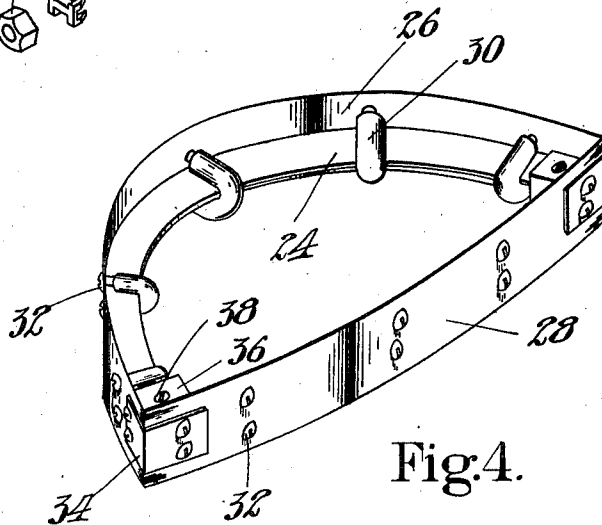


Fig. 4.

WITNESSES.

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CUTTING-DIE.

1,030,529.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, LUDGER PAINCHAUD, a citizen of the United States, residing at Salem, in the county of Essex and State of Massachusetts, have invented certain Improvements in Cutting-Dies, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to dies of the class used with clicking presses for cutting blanks from thin sheet material, such as upper leather for boots and shoes, and relates more particularly to the type of die which comprises a supporting frame having one or more cutting blades of flexible material conformed thereto and supported thereby.

It is an object of the present invention to provide a die of this type having certain advantages over those now in use.

Heretofore it has been customary to form the supporting frame of such dies of strip steel or other suitable strip material having the cross section desired in the frame and shaped to the outline of the blanks to be cut. My invention however contemplates a die having a sheet metal frame, which preferably may be constructed from the metal templet which it has been customary to use in the manufacture of dies merely as a pattern to give the desired outline of the die and heretofore discarded in the process of making the die. Such a frame may be easily cut out of sheet material and conveniently shaped with a high degree of accuracy. Dies constructed in accordance with this invention, therefore, possess marked advantages in accuracy of outline and in economy of manufacture. A die having a sheet metal frame possesses also advantages in lightness and in rigidity of contour since a frame of this character is particularly well adapted to withstand distorting forces tending to change the contour of the cutting edge, whereas the cutting blades, which offer great resistance to edgewise bending, serve to stiffen the die and hold it rigid against

deformation by a bending of the sheet metal frame.

It is important that a die for cutting upper leather should be of such character as to afford the workman an unobstructed view of practically the whole area of the blank about to be cut in order that the die may be accurately positioned on the skin on that part thereof which is best suited from its character and wearing qualities to the particular blank to be cut and also to avoid imperfections or weak spots in the leather and so avoid waste.

It is therefore an object of the present invention to provide a die having a sheet metal frame so constructed that the die shall retain permanently its original outline, whatever treatment it receives, the rigidity of the die being secured without interfering with the cutter's view of the skin when using the die. This result may be obtained by cutting away the center portion of the frame on lines parallel to the marginal edges thereof, thus forming a skeleton sheet metal frame, having, however, a width sufficient to insure the required rigid resistance to change of contour.

An important feature of the present invention relates to the fastening means by which the cutting blades are attached to the frame. Preferably a plurality of fastening devices are provided at suitable intervals and arranged to engage the cutting blades at points above and below the plane of the sheet metal frame and maintain the blades and frame in close contact and in a perpendicular relation. In this connection the invention contemplates the provision of fastening devices of such a type that they may be attached to the frame at any desired point without special preparation of the frame, as by punching or drilling. Such an arrangement obviates the difficulty of bringing into registration a series of recesses or the like formed in separate members as is necessary when such fastening devices as screws or bolts are inserted in a frame for attaching flexible cutting blades.

Another important feature of the inven-

tion relates to devices for engaging the ends of adjacent cutting blades and preventing them from spreading while the die is in use. Preferably a fastener is provided at each corner of the die having angularly extending flanges adapted to engage the outer faces of the cutting blades at their adjacent ends and draw the blades together and toward the frame of the die.

The cutting blades themselves may be formed from ribbon steel which is obtainable as a commercial article either sharpened or not as desired. Single edged cutting dies may be constructed with good advantage in accordance with the present invention but it is particularly useful in its application to double edged dies since by employing ribbon steel sharpened on both edges, or by sharpening both edges of unsharpened stock previously attached to the frame, a double edged die may be produced at substantially the cost of a single edged die.

The advantages above set forth and others incident to the invention will be best understood and appreciated from the following description of several preferred embodiments thereof selected for purposes of illustration and shown in the accompanying drawings, in which,—

Figure 1 is a view in perspective of a die for cutting tip blanks; Fig. 2 is a fragmentary view of one corner of the die shown in Fig. 1; Fig. 3 is a detail view of a device for connecting the ends of the cutting blades; Fig. 4 is a view in perspective of a die similar to that shown in Fig. 1 having a modified form of blade fastening device.

The die shown in Fig. 1 is adapted for use with a clicking press to die out blanks for toe-tips from upper leather, and comprises a skeleton frame 4 of sheet metal, such as mild sheet steel, having a contour corresponding with the outline of the blanks it is desired to cut by the die and the thin double edged cutting blades 6 and 8 conforming to the contour of the frame 4 and rigidly attached thereto. The cutting blades 6 and 8 are attached to the frame 4 by means of headless split bolts 10 which straddle the frame 4 and project through the cutting blades to the outside thereof where they are provided with nuts 12 which draw the blades tightly against the contour of the frame 4 and at the same time cause the bolts 10 to clamp the frame between their two sides. Wedges or plugs 14 may be driven into the split ends of the bolts 10 after the nuts have been turned up tightly and serve to prevent accidental loosening of the nuts while the die is in use. The bolts 10 are located at points sufficiently close together to maintain the inner surface of the cutting blades in continuous engagement with the contour of the frame 4 and

by engaging the blades at points on both sides of the frame serve to maintain the blades perpendicular to the frame. At the corners of the die there are provided split bolts 16 each having a specially constructed head 18 consisting of angularly extending flanges which are adapted to bear against the adjacent ends of the cutting blades, as is indicated in Fig. 1, and prevent them from becoming separated. The adjacent ends of the blades are slotted, as shown in Fig. 2, to permit the passage of the bolts 16. The inside corners of the frame are squared off and a saddle block 20 is interposed between the corner of the frame and the nut in order to afford a better bearing for the nut.

It is desirable to provide lateral indentations in the cutting edge of a die for cutting uppers, in order to form notches in the outline of each blank indicating the size or other characteristics of the blank according to a code of arbitrary symbols. Such size-indicating notches are formed by indentations in the short piece 22 soldered or otherwise rigidly attached to the inside surface of the cutting blade 6 which is recessed at this point so that the indentations in the piece 22 form a continuous cutting edge with the remaining portions of the blade.

The die shown in Fig. 4 comprises a frame 24 carrying the double edged cutting blades 26 and 28 all of which correspond to the similar parts of the die above described. The cutting blades are attached to the frame by means of heavy staples 30 which straddle the frame, and have their ends drilled and tapped to receive screws 32 extending through the cutting blades. The blades are drawn up against the frame by turning in the screws 32 and are thus made to conform to the outline desired in the blanks to be cut.

The die is strengthened and the ends of the cutting blades held in contact by the angle pieces 34 which are connected with blocks 36 by screws passing through the ends of the cutting blades. The blocks 36 are located in pairs at the corners of the die and clamped to the frame by vertical screws 38.

In producing the dies above described a paper or cardboard pattern giving the outline desired in the blanks to be cut is placed upon a sheet of mild steel, or other suitable sheet material, and the sheet-metal frame is cut out, preferably in a hand-power shearing machine. This operation may be performed with a high degree of accuracy and requires a comparatively short time. The center portion of the solid frame is then removed leaving an open center of the same general shape as the blank.

The cutting blades are preferably formed from tempered ribbon steel although when

the frame presents sharp or reëntrant curves it may be desirable to shape or partially shape the blade stock before tempering it and attaching it to the frame in order to avoid too great an initial stress in the die.

A strip of such stock, sharpened or not as desired, is drilled or punched at suitable points, conformed by bending to the contour of the frame and attached thereto by any suitable fastening devices which are adapted to straddle the frame and engage the blades at points on opposite sides thereof. The strip is cut off at the corners of the die and a second strip is attached to the frame, starting from the end of the first strip and extending to the next corner of the die and so on till the die is completed. Special fastening devices, such, for example as the flanged bolts above described, are then provided for holding the ends of the cutting blades together, and the die is completed by providing it with size-indicating indentations or other auxiliary marking devices.

The method of making dies as above outlined is not claimed herein but forms the subject matter of my copending application Ser. No. 524,493, filed Oct. 25, 1909.

Having indicated the nature of the present invention and described preferred embodiments thereof, I claim:—

1. A die of the class described, comprising a frame of sheet metal having the outline desired in the blanks to be cut and cutting blades of flexible material attached to said frame about its edge, the edge of the frame engaging the inner surfaces of the blades between the edges of the blades.

2. A die of the class described, comprising a frame of sheet metal having the outline desired in the blanks to be cut, cutting blades of flexible material, and fastening devices engaging said blades at points on both sides of said frame.

3. A die of the class described, comprising a frame of sheet metal having an open center and an outline corresponding to that desired in the blanks to be cut, cutting blades of flexible material, and means for attaching said cutting blades to the frame and maintaining them perpendicular to said frame with the edge of the frame engaging the inner surfaces of the blades between their edges.

4. A die of the class described, comprising a skeleton frame, cutting blades of flexible material, and fastening devices straddling said frame and connecting said blades thereto.

5. A die of the class described, comprising a skeleton frame, cutting blades of flexible material, and means for maintaining said blades in engagement with the contour of said frame, said means having portions extending on opposite sides of said frame and a portion for engaging said blades.

6. A die of the class described, comprising a skeleton frame, cutting blades of flexible material conforming to the curves in said frame but meeting at the corners thereof, and connecting means engaging the ends of said blades and extending on both sides of the frame.

7. A die of the class described, comprising a skeleton frame, cutting blades attached thereto and meeting at the corners thereof, and connecting means having a portion shaped to straddle the frame and angularly extending flanges adapted to engage the ends of adjacent blades.

8. A die of the class described, comprising a skeleton frame, cutting blades attached thereto, and corner fastening devices constructed and arranged to engage the ends of adjacent blades and also engage the frame of the die.

9. A die of the class described, comprising a skeleton frame, cutting blades attached thereto having recessed adjacent ends at the corners of the die, and a fastening device at each corner constructed and arranged to pass through the recessed adjacent ends of the cutting blades and engage them upon their outer faces to prevent spreading of the blades.

10. A die of the class described, comprising cutting blades of ribbon steel, and a skeleton frame of sheet metal carrying said blades and disposed at right angles to the blade substantially midway between their edges, thereby offering rigid resistance to widthwise bending of said blades.

11. A die of the class described, comprising a supporting frame of sheet material, and cutting blades of ribbon steel attached thereto, extending on both sides of the frame and at right angles thereto, thereby offering rigid resistance to bending of said frame transversely to the plane of its surface.

12. A die of the class described, comprising a metal frame of rectangular cross section having the outline desired in the blanks to be cut, cutting blades of flexible material attached to the edges of said frame and disposed substantially at right angles to the long axis of a section of the frame substantially midway between their edges, said blades taking their shape from said frame and being rigidly supported thereby.

13. A die of the class described having, in combination, a frame, cutting blades attached thereto, and corner fastening means comprising a stud having a head for engaging the ends of adjacent blades, a frame engaging member, and means for holding the head of said stud in engagement with said blades.

14. A die of the class described having, in combination, a sheet metal frame, cutting blades attached thereto, and corner fasten-

ing means comprising a split stud having a
head shaped to engage the ends of blades
joining each other at an angle, a block hav-
ing a reduced portion adapted to fit into said
5 stud, and a portion for engaging the frame,
and a nut on said stud for clamping the
frame between said block and the cutting
blades.

In testimony whereof I have signed my
name to this specification in the presence of 10
two subscribing witnesses.

LUDGER PAINCHAUD.

Witnesses:

THOMAS LUND,
HERBERT W. KENWAY.