M. B. KAVEN.

DIE.

APPLICATION FILED MAR. 15, 1911.

1,095,117. Patented Apr. 28, 1914.

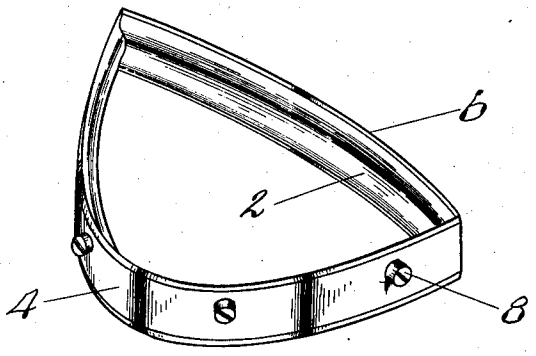


Fig. 1.

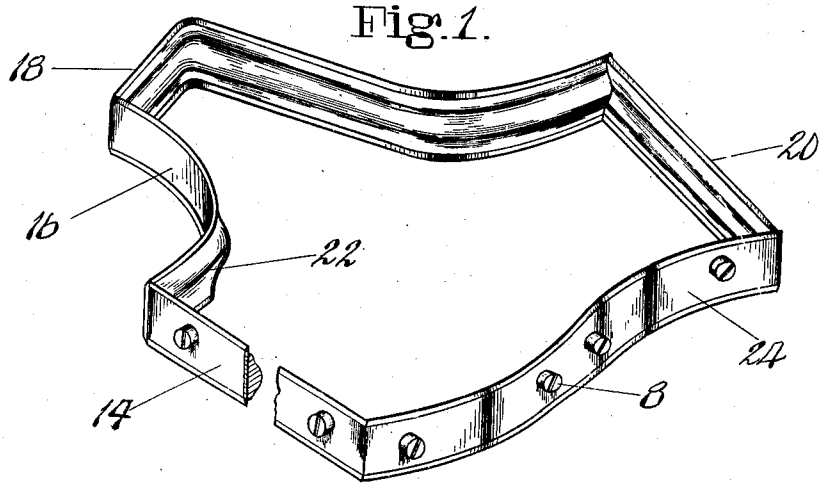


Fig. 2.

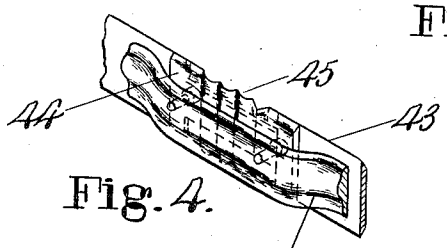
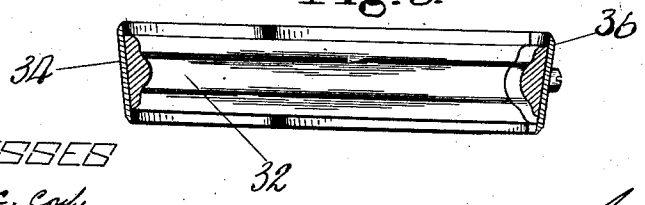


Fig. 4.

Fig. 3.



WITNESSES

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DIE.

1,095,117. Specification of Letters Patent. Patented Apr. 28, 1914.

Original application filed May 17, 1909, Serial No. 496,545. Divided and this application filed March 15, 1911. Serial No. 614,644.

To all whom it may concern:

Be it known that I, MOSES B. KAVEN, a citizen of the United States, residing at Beverly, in the county of Essex and State of Massachusetts, have invented certain Improvements in 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 for cutting blanks from sheet material and more particularly to an improved skeleton frame die for use with clicking presses for dieing out the various parts of shoe uppers from upper leather.

A skin of upper leather varies greatly in quality, thickness and character in its different parts and in cutting blanks therefrom the die must be accurately positioned on the skin in order to cut blanks for different parts of the upper from that portion of the skin which from its character and wearing qualities is best adapted to it, to avoid imperfections or weak spots in the leather and to utilize all parts of the stock to the best advantage and thereby avoid waste. It is, accordingly, desirable that the dies shall cover as little of the leather as possible in order that the workman may inspect the leather critically in determining the location of the die for cutting each blank. On the other hand it is essential that the die shall be rigid and free from any tendency to spring out of shape under the repeated pressure to which it is subjected by the clicking press, since the dies must at all times conform accurately to the outlines of the patterns from which they were made and a deformation of a die would destroy its usefulness. It is therefore important that the die shall be so constructed as to retain permanently its original outline, whatever treatment it receives, and that such rigidity shall preferably be secured without interfering with the cutter's unobstructed view of the skin when using the die.

Accordingly, one object of the present invention is to provide a skeleton frame die having great rigidity and being of such a construction as to permit a practically unobstructed view of the blank about to be cut and of the cutting edge of the die.

In cutting a skin of leather into blanks it is necessary for the workman to move the die over the surface of the leather, trying it here and there to see if there is stock enough for the blank and to avoid imperfections. In this process the cutting edge of a heavy die is apt to scratch and mar the surface of the stock, especially in operating on patent or fancy leather.

With this in view another object of the invention is to construct a die which shall be as light as is consistent with the required strength and rigidity and at the same time be of such shape that it may be easily lifted and manipulated by the workman.

Still another object of the invention is to provide a die of the open skeleton frame type which may be sharpened at both edges if desired and thus adapted for use in dieing out right and left blanks.

It has been found that a die having one or more thin cutting blades secured to and taking their shape from the outer face of an open skeleton frame possesses the qualities above enumerated. A die of this type possesses the further advantage that it may be easily and accurately constructed and at a minimum of expense. A preferred method of constructing such a die, when cast metal is employed in the construction of the open skeleton frame, is disclosed in my co-pending application Serial No. 496,545, filed May 17, 1909 of which the present application is a division, but the die may be constructed by other methods if preferred and the frame need not necessarily be of cast metal.

It will be apparent that together with the advantages already mentioned a die constructed according to the present invention possesses the additional advantage that the blades may be removed from the frame for replacement in case a portion of the cutting edge becomes damaged, whereas in the older type of integral die a nicked or broken portion in the cutting edge destroyed the usefulness of the entire die.

Another important advantage in dies of the type herein disclosed is that by forming the blade carrying face of the frame on a bevel, instead of perpendicular to the planes of the cutting edges, as in the dies heretofore discussed, dies may be produced in which the outlines of the two cutting edges are of the same shape but of different sizes. This feature of the invention may be em-

bodied, to advantage, in "straight dies," that is to say, dies in which the two cutting edges would otherwise cut blanks of the same shape, as distinguished from "rights and lefts."

An important feature of the invention relates to a construction of the die whereby size indicating notches may be formed in the outline of each blank during the dieing out operation. Heretofore lateral indentations have been formed in the dies by deflecting the material of the cutting edge of the die and the edges of the indentations have been sharpened to cut the size indicating notches in the outline of the blanks.

For convenience in manufacture and to avoid impairing the strength of the cutting blades, my invention contemplates a novel arrangement wherein the indentations are formed, not in the cutting blades of the die, but in an auxiliary piece adapted to be inserted in close proximity to the blade. To this end there may be made up and kept in stock a number of short pieces of material, similar to that forming the blades, having the different size and width indicating indentations formed therein. A recess may be formed at the proper point in the face of each frame and a piece of material having the proper indentations for the die in question is inserted in the recess in the frame and subsequently the cutting blades are secured to the frame, extending continuously past the short piece, the body of which fills the recess and forms a continuous surface with the undeflected portions of the frame. To prevent punchings accumulating between the blade and the piece having the size indicating indentations, the edge of the blade is cut away opposite the indentations. The unindented cutting portions of the short piece are beveled on the inside and so that its cutting edges coincide in outline with the edges of the main portion of the blade, thereby forming a single cutting edge at their juncture. The indentations extend continuously across the strip in which they are formed, being in the nature of corrugations which tend to stiffen the strip. It is believed that corrugations which extend continuously across the strip have not been embodied in dies of any description heretofore constructed and such corrugations therefore constitute an important feature of the present invention.

The features and advantages above discussed and others incident to the invention will be best understood and appreciated from the following description of several dies embodying the invention which are 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 similar view of a quarter die, a fragment being shown broken therefrom to disclose the shape of the frame; Fig. 3 is a view in cross section of a die for cutting blanks of two different sizes; Fig. 4 shows one form of inserted piece with size indicating indentations.

In cutting blanks for uppers it is often necessary to form the blank for a right shoe reversely as compared with the corresponding blank for the left shoe, or the blank for one side of a shoe reversely with respect to the blank for the other side, and a convenient and economical method of forming these blanks, known as right and left blanks, is by the use of a double edge die, the two cutting edges of which will cut similar but reversely shaped blanks, as will be obvious. I have shown in Fig. 1 a die of this description, as illustrating one embodiment of the present invention. This die consists of a rigid, open, continuous frame 2, of such a cross section as to afford the operator an unobstructed view of the lower cutting edge of the die as it rests upon the leather, thus enabling him to detect imperfections occuring near the outline of the blank. The cross section is selected also with a view to furnishing the requisite stiffness to the die, and preferably will be a modified triangular section as shown in Fig. 2. Such cross section insures sufficient strength in the frame which at the same time offers an unobstructed view of the cutting edge of the die, and preferably extends from a relatively thick central portion into proximity with the edges of the blades, thus supporting and stiffening them. To the outer vertical surface of the frame 2 are secured the double edged cutting blades 6 and 4 beveled on their outer sides. The blade 6 is secured to the back or straighter side of the frame and the blade 4 is bent about the forward part of the frame, the ends of the blade 4 overlapping and, if desired, extending slightly past the ends of the blade 6 in order that the blanks cut by the die may be completely severed from the skin out of which they are cut. The cutting blades may be secured to the frame by any suitable means, for example, the screws 8, the only essential being that such securing points shall be sufficiently close together to insure that the blades are held in continuous contact with the outside of the frame. This is important since the outer surface of the frame is profiled to the desired outline and any departure of the blades from the surface would cause a corresponding defect in the outline of the blanks. The inner sides of the ends of the blade 4 are soldered or brazed to the ends of the blade 6 to prevent separation of the blades and a resulting gap in the cutting outline of the die.

Fig. 2 illustrates a double edged die for cutting right and left quarter blanks, the

die being constructed similarly to that shown in Fig. 1. In this die the frame is indicated by the reference character 22. The flexible blades 14, 16, 18, 20 and 24 are secured to the vertical outer face of the frame by the screws 8 as in the case of the die first described.

The die shown in cross section in Fig. 3 has cutting edges which vary in the size of their outlines, one being somewhat larger than the other. In this die the outer face of the frame 32 is beveled instead of being perpendicular to the planes of the cutting edges. The cutting blades 34 and 36 are attached to the beveled face of the frame 32 and as a result of its formation the outline of the upper cutting edge is larger than that of the lower cutting edge. By properly designing the angle of bevel the difference in the size of the outlines of the cutting edges may be made equal to one size or one half size in the blanks, for example, a blank for a number 6 shoe may be died out by one edge of the die and a blank for a number 6½ or 7 shoe died out by the other edge.

Indentations may be formed in the cutting edges of the blades of the dies above described for cutting size indicating notches in the outlines of the blanks as they are died out. In accordance with the present invention, however, it is preferred to effect this result by forming indentations or corrugations in an inserted piece, removing the part of the cutting edge of the die adjacent to such inserted piece. As shown in Fig. 4, a recess or depression is formed in the outer face of the frame 42 by bending the frame and in this depression is placed a short piece of strip steel 44 having V-shaped and U-shaped corrugations 45 with sharpened cutting edges. The cutting blade 43 is secured to the outer face of the frame and extends continuously past the short piece 44. It will be noted that the transverse corrugations 45 in a large measure stiffen the piece 44 and incidentally the whole die against being bent or doubled over by the impact of the clicking press arm.

As already stated one method of constructing the dies above described is disclosed in my co-pending application to which reference may be had for details of the method. Briefly stated that method consists in casting a rough frame of approximately the required contour, reducing the frame to the exact size and shape by the cutter of a profiling machine and securing flexible cutting blades to the face of the frame which has been thus accurately shaped. The cutting blades are formed of thin ribbon steel which is obtainable as a commercial article in a tempered or annealed condition, as desired, and sharpened or unsharpened. In constructing the two-size die shown in Fig. 3 a conical profiling cutter is employed to form the desired bevel in the frame and wide strips of steel are employed for the blades which strips may be ground on their opposite edges to secure parallelism before sharpening. The present invention, however, is not limited to a die having a cast metal frame but may be constructed with a frame formed by bending strip steel pieces to shape and then welding together the ends of the pieces to form an integral frame. Such a method of shaping steel strips is described in connection with the manufacture of integral dies in United States Letters Patent No. 922,926 granted May 25, 1909 on an application of John M. Lynch.

The operation of securing the flexible blades to the frame may be effected in any preferred manner. As herein shown screws are employed but other fastening devices would answer all the requirements or the blades might be electrically welded to the frame as explained in said co-pending application above identified. Preferably the ends of the cutting blades are soldered or brazed together to prevent the blades from opening at the corners of the die.

Having described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A die for cutting blanks from upper leather having included in its cutting periphery a double edged piece of strip steel with corrugations of uniform cross section extending from one edge to the other, the corrugations being sharpened at their edges to form cutting indentations which merge in the cutting edge of the die.

2. A die comprising a frame and flexible cutting blades secured thereto, said frame being thin in cross section and tapering on the inside from its thickest portion toward the cutting edge of the blades, thereby permitting an unobstructed view of the cutting edge as it rests upon the material to be cut.

3. A double edged die comprising a frame and flexible double edged cutting blades having a width greater than that of the frame secured thereto, said frame being of a cross section tapering from its thickest portion toward the cutting edges of the blades, thereby permitting an unobstructed view of the cutting edge resting upon the material to be cut.

4. A die comprising an open, internal frame and cutting blades secured thereto, said frame having a modified triangular cross section, whereby stiffness is imparted to the frame and an unobstructed view of the cutting edges of the blades afforded the operator.

5. A die comprising an open, internal frame having a continuous outer face and a single thin cutting blade secured thereto to each section thereof, said frame extending into proximity to the cutting edge of the

blade to support the cutting blade in proximity to its edge, and having the portion adjacent to said cutting edge shaped to afford the operator an unobstructed view of the cutting edge as it rests upon the material to be cut.

6. A die comprising an open, internal frame and flexible cutting blades conformed and secured to the outer face of said frame and being beveled on their outer sides to form cutting edges.

7. A die comprising a rigid, open, internal frame and cutting blades of flexible material secured to the outer side of said frame and being shaped thereto, the cutting edge of one blade extending slightly beyond the end of the blade adjacent thereto.

8. A die comprising a rigid frame, and a plurality of blades of flexible ribbon steel secured to the outer face thereof and overlapping at the corners, a metallic union being formed between the ends of adjacent blades.

9. A die comprising a rigid frame, and a plurality of blades of ribbon steel secured to the face thereof and overlapping at the corners, the end of one blade being soldered to the side of the adjacent blade at their point of engagement.

10. A die comprising cutting blades, a supporting frame therefor about the periphery of which said blades are bent and a short piece of strip material having a cutting edge with size and width indicating indentations formed therein, said piece being secured to the die in line with the cutting edge of the die blade and reinforcing the blade at a cut-away portion.

11. A die comprising cutting blades and a supporting frame therefor, and a cutting device distinct from the blades of the die for cutting size indicating notches in the outline of the blank cut by the die.

12. A die comprising cutting blades and a supporting frame therefor, and a cutting device co-extensive with a portion of the blades of the die constructed and arranged for cutting size indicating notches in the outline of the blank cut by the die.

13. A die comprising cutting blades and a supporting frame therefor, and a cutting device located between and supported by said frame and blades for cutting size indicating notches in the outline of the blank cut by the die.

14. A double edged die, comprising a frame and flexible cutting blades secured thereto and taking their shape therefrom, the conformation of the frame being such that the outlines of the opposite cutting edges of the blades are of different sizes but of the same shape.

15. A double edged die, comprising a frame and thin cutting blades secured to the faces thereof and conformed thereto, the faces of the frame being beveled whereby the outlines of the opposite cutting edges of the blades are of different size.

16. A die for cutting upper blanks having in its periphery a strip steel piece having V-shaped and U-shaped corrugations formed therein which extend from edge to edge of the strip, the edges of the corrugations being sharpened and lying in the plane of the cutting edge of the die, whereby V-shaped and U-shaped indicating notches are cut in outline of each blank as it is died out.

17. A die for cutting upper blanks having parallel edges, a part of said die being provided with corrugations of uniform cross section extending from edge to edge.

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

MOSES B. KAVEN.

Witnesses:
HERBERT W. KENWAY,
ARTHUR L. RUSSELL.