This invention relates to leather manufactures and particularly to dies for cutting and impressing relatively thin leather such as is used in the personal leather goods industry.

It has been the practice in this industry to enhance the appearance of the finished product by embossing or impressing a line in the grain surface adjacent an exposed raw edge. This line, frequently referred to as an edge crease line, was first made by a hand creasing iron manually forced along the raw edge. This produced an excellent appearing edge crease line but the operation was costly. In order to offset such cost the cutting blade of the blanking die was provided with a rigid shoulder having an embossing ridge spaced slightly from the knife. This ridge impressed a line in the grain surface of the leather with each cut of the blade. However, scrap loss was high whenever the thickness of the leather varied a few thousandths of an inch from the standard for which such blanking and embossing die were designed. If the thickness increased over standard, the ridge would not too deep and break the grain surface or even tear the leather. If the thickness decreased under the standard the ridge would not make any perceptible crease line. Where the leather used is relatively thin the percentage of skins which are under or over the acceptable limits of thickness, increases and the manufacturer of the articles has enough scrap to make the use of such rigid dies uneconomical.

It is an object of this invention therefore to provide a die for both cutting and impressing leather which will make a consistently uniform impression or crease line in such leather even when the thickness of the leather varies from the standard thickness for such die.

This object is obtained by mounting a creasing or embossing ridge adjacent the cutting blade of the die and providing such ridge with spring resisted movement relative to such cutting blade. The spring resistance is strong enough to provide sufficient force to make a permanent crease line in the grain face of the leather being cut by the cutting blade and weak enough to permit the creasing ridge to move relatively to the cutting blade to prevent such ridge from impressing such grain face beyond that required for such permanent crease line as said cutting blade advances through such leather to complete the cutting thereof.

The novel features, which are considered characteristic of the invention, are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and its method of operation, together with additional objects and advantages thereof, will best be understood from the following description of a specific embodiment when read in connection with the accompanying drawings, in which:

Fig. 1 is a view in front elevation with parts broken away and shown in section of a cutting and embossing die embodying the present invention.

Fig. 2 is a top plan view of the die viewed in Fig. 1 with parts broken away for clarity in illustration.

Fig. 3 is a sectional view taken on the line 3-3 of Fig. 1 showing the relative position of the parts of the die when unpressed.

Fig. 4 is a view similar to Fig. 3 showing the relative position of the parts when completely depressed by the press in which it is mounted.

Fig. 5 is an enlarged fragmentary sectional view showing the relation of the embossing ridge and cutting blade in the final stage of cutting and embossing a piece of leather, and

Fig. 6 is a perspective view of a piece of leather cut, embossed and punched by the simultaneous action of the cutting and embossing die.

The cutting and embossing die illustrated in the drawings is mounted in a press of well known design used in the leather goods industry. In this press the die is mounted on the lower member of the press and the leather 4, together with a paper backing 6, is fed over the die while the upper member 8 of the press forces the leather and paper down on the working surfaces of the die.

In this particular embodiment the die has a mounting plate 12 which is secured in customary manner to the bed plate 10 of the press. A gripper plate 14 is movably mounted on the mounting plate 18 by guide posts 16 which limit the upward motion of the gripper plate. The plate is continually urged upwardly by compression springs 18 encircling the guide posts. These springs are of sufficient force to support the weight of the die and yet will readily give as the leather 4 is initially pressed downwardly on the die by the upper member 8 of the press. These springs thus furnish enough tension to hold the leather 4 and paper 6 in proper location between the embossing ridge of the die and the upper member of the press. When the working load is asserted by the press the springs 18 will be completely compressed and the gripper plate 14 will be flatly supported by the mounting plate 12.

A table or die supporting plate 24 is fixedly
mounted in spaced relation to the gripper plate 18 by pillars 26, to which it is held by machine screws 27. The cutting die 28 has a projection forming a cutting blade 28, the cutting die 28 being mounted upwardly from the plate 18 through the pillars 26 and into the table 24. The table 24 provides a support for the cutting die 28 which is held thereon by machine screws 27. The cutting die 28 has a projection forming a cutting blade 28. This projection has a substantial straight inner wall 29 which provides a bearing and guide for the relatively movable embossing die. Locating pins 32 projecting from the table 24 fit in holes in the cutting die 28 to properly locate it on said table. The configuration of the blade 28 may be varied as desired and dies with various shapes of blades may be interchangeably mounted on the table 24.

As previously pointed out, the cutting blade 28 formerly had a shoulder with an embossing ridge spaced slightly downward from the cutting edge of the die. Since there was no relative movement between the embossing ridge and the cutting edge, the die would only act satisfactorily with leathers of a standard thickness for which such die was designed. To correct this, an embossing die 40 is mounted above the table 24 and carried by a movable plate 34 supported beneath said table. Pins 35 projecting upwardly from such plate through the table 24 guide and support the embossing die which is held thereon by screws 44. Heavy compression springs 35 press the plate 34 upwardly against the under surface of the table 24 and keep the die 40 spaced from such table. The embossing die 40 has an upstanding part of the top of which is slightly rounded to form an embossing ridge 42. The outer side of this part is in slidable engagement with the wall 29 to properly locate the ridge 42 slightly spaced from the cutting edge of the blade 28 as is shown in Fig. 5. However, the embossing die may also be guided in proper relation to the cutting die by pins 45 which project from the table 24 and are slidable received in holes in the embossing die.

In the extended position of the embossing die, the ridge 42 extends slightly above the cutting edge of the blade 28 and hence when the leather 6 and paper backing 8 are urged downward by the upper member 8 after the gripper plate 18 has been fully depressed, the embossing die 40 will be lowered against the force in the springs 35. This force is enough to drive the ridge 42 into the leather 6 from the grain side a depth sufficient to make a permanent groove therein. However, such force is weak enough to permit the embossing die 40 to move downwardly with respect to the cutting blade 28 as the upper member 8 continues downwardly to complete the cutting of the leather. At the lowest point in the down stroke of the upper member 8 the embossing die 40 is still spaced from the table 24 as shown in Fig. 4. Hence only the force in the springs 35 is used to make a creasing line. If the thickness of the leather 6 is greater than the standard for such die, the embossing die 40 will be moved downwardly closer to the plate 24 and still no force except that applied by the springs will be added. Thus the depth of the creasing line will remain constant even though the thickness of the leather varies and the percentage of scrap due to incomplete creasing lines or creasing lines deep enough to change the leather is removed. A sample of a piece of leather cut to a desired shape and provided with a creased line by the cutting and embossing die herein described is illustrated in Fig. 6 wherein the numeral 7 indicates the crease line. In some pieces the crease line need not extend for the entire length of the raw edge. In such instance the embossing die 40 is provided with a differently dimensioned pins 23, and mounting dies with ridges 42 of different shapes may be interchangeably mounted on the pins 36. While in this embodiment there are two heavy compression springs 35, such number may be increased where the length of the embossing ridge 42 is materially increased, for example, by maintaining a constant force per inch of length of such ridge. In some instances it may be desirable to provide a punched hole within the piece of leather being cut, such as is illustrated at 62 in Figs. 4 and 6. To accomplish this a base 50 is mounted in an appropriate aperture in the embossing die 40 and secured to the table 24 by a screw 52. A tubular cutting die 54 is carried by the base 50 with its cutting edge projecting to substantially the same level as the edge of the cutting blade 28. This die will cut a circular disk from the piece of leather 6 each time a piece is cut by the cutting die. An ejector pin 55 may be mounted within the tubular die 54 to eject the disks cut by such die. The pin 58 has a collar 59 positioned below the supporting plate 34 and urged upwardly with respect to the embossing die 40, acting between such collar and the gripper plate 14. The pin 59 is depressed as the hole is cut and after the upper member 6 is raised, the spring force will push the pin 58 up and eject the slug from within the end of the tubular die 54. Punches of this type may be located at any desired spot within the confines of the cutting die.

Although only one embodiment of the invention is shown and described herein, it will be understood that this application is intended to cover such changes or modifications as come within the spirit of the invention or scope of the following claims.

I claim:

1. A die for both cutting and impressing leather comprising a table adapted for movably receiving a cutting die, a relatively fixed plate on which said table is supported, a movable plate between said table and said fixed plate, mounting pins on said movable plate extending through openings in said table, a cutting die for said table, an embossing die on said movable plate and normally spaced from said table, and spring means between said fixed plate and said movable plate to resiliently maintain said embossing die spaced from said table.

2. A die as claimed in claim 1 in which said spring means will compress to allow said embossing die to move toward said table under force insufficient to cause said embossing die to cut or break the fibre of leather being impressed thereby.

3. A die as claimed in claim 1 in which said cutting die has a cutting edge and said embossing die has an embossing ridge spaced outwardly of said cutting edge when said spring means holds said movable plate against said table.

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