Nov. 16, 1943. H. M. BOLSTON 2,334,379

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Filed July 7, 1943 2 Sheets-Sheet 1

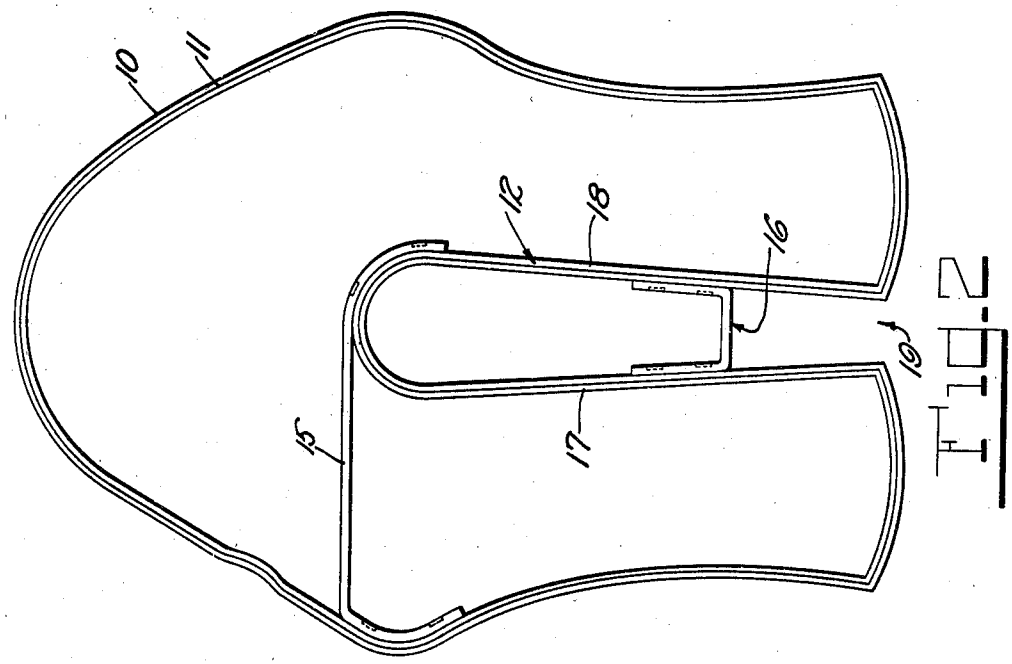


FIG. 2

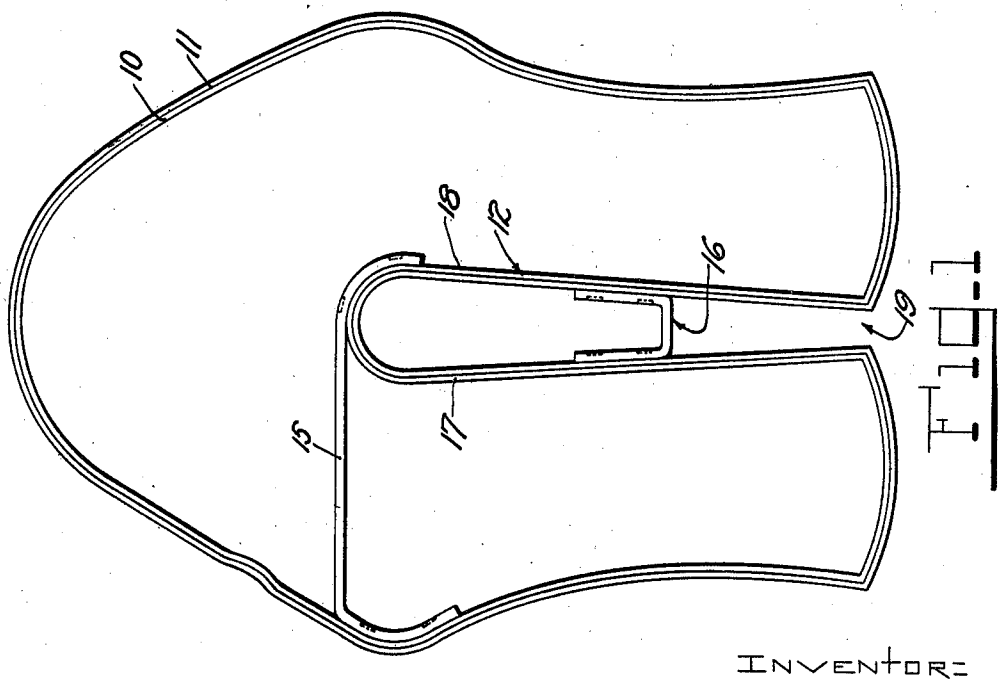


FIG. 1

INVENTOR:
Harry M. Bolston
by Dike, Calver & Porter
Attys.

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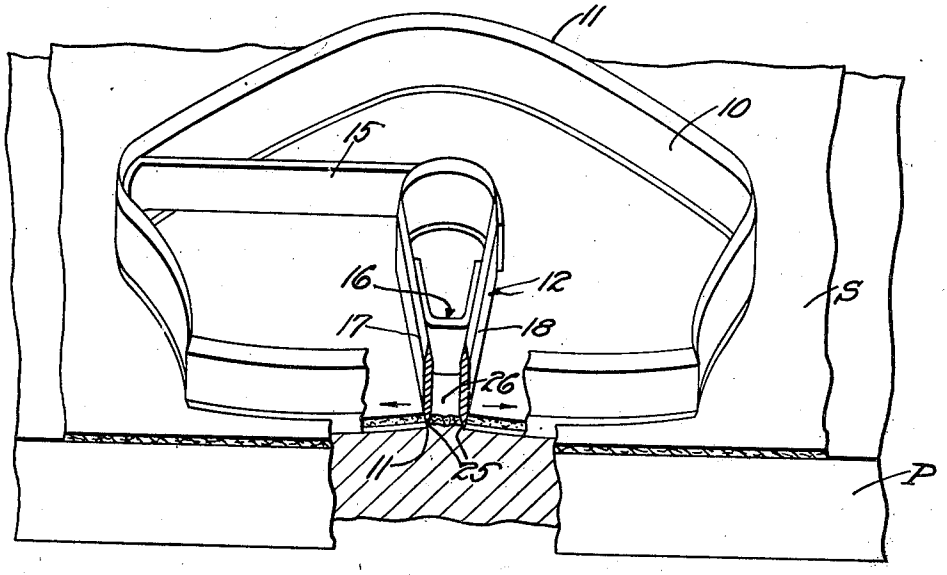


FIG. 3

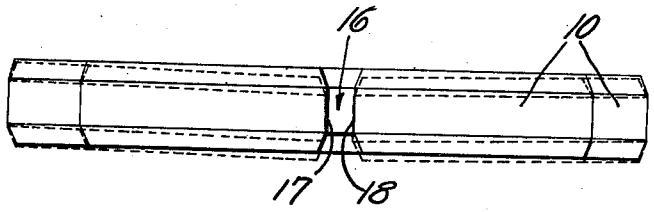


FIG. 4

INVENTOR:
Harry M. Bolston
by Dike, Calver & Porter Attys.

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UNITED STATES PATENT OFFICE

2,334,379

DIE

Harry M. Bolston, Swampscott, Mass., assignor to Joseph E. Knox & Co., Inc., Lynn, Mass., a corporation of Massachusetts

Application July 7, 1943, Serial No. 493,691

2 Claims. (Cl. 164—29)

My invention relates to dies for blanking out shoe vamps or other blanks having a re-entrant portion from sheet material, such as leather, rubber, fabric or other sheet material.

Dies for this purpose are essentially a continuous metal strip shaped to correspond to the outline of the vamp blank including its reentrant portion and having its edges lying in spaced parallel planes, one or both of the edges being a continuous cutting edge. Such dies are reenforced by a reenforcing member connecting the inner end of the reentrant portion of the die with one or both of its sides. The reentrant portion of shoe vamps blanked out by such dies must be cut very accurately. Consequently, it has been considered essential to reenforce the die by a reenforcing member bridging the throat of the reentrant portion.

Such dies are used in conjunction with a clicking machine having a flat platform or block which may be constructed of wood, rubber or fibre. The machine also is provided with an arm which can be swung to any position over the platform or block. When the arm is in any such position it can be caused to move toward the platform to strike a hammer-like blow upon a blanking out die positioned below it upon the platform.

In blanking out shoe vamps or other blanks, a sheet of material, such as leather, is positioned upon the platform of the clicking machine and the die placed upon the sheet material. The arm of the clicking machine is swung to a position over the die and then is caused to strike the die with a hammer-like blow to cause the die to cut a blank from the sheet material.

Considerable trouble has been experienced due to breakage of the reenforcing member bridging the throat of the reentrant portion of the die. I believe this has been caused by forces created during the cutting operation by the taper of the knife edge acting as a wedge upon the edges of the narrow portion of the sheet material within the reentrant portion of the die tending to spread the throat of the reentrant portion of the die. I have discovered that this trouble can be overcome while maintaining the required cutting accuracy of the die by reenforcing the die so as to permit limited flexibility of the throat region of the reentrant portion. This is accomplished in the die of the invention by reenforcing and tying the inner end of the reentrant portion to the side of the die and eliminating the reenforcing member bridging the throat of the reentrant portion. In addition, in certain dies a reenforcing member is employed bridging the reentrant portion at a position intermediate its throat and inner end such that the portion of the die between the reenforcing member and the throat of the reentrant portion may have a limited degree of flexibility. The position of this reenforcing member relative to the throat of the reentrant portion of the die will vary with the size of the die and particularly with the width of the reentrant portion. The reenforcing member can be positioned closer to the throat of the reentrant portion when the latter is wide than it can when the throat is narrow. By reenforcing the die in this manner, the inner end of the reentrant portion, where greatest accuracy in cutting is required, is held relatively rigid while permitting limited flexibility at the throat.

The invention will be more clearly understood from the following description in conjunction with the accompanying drawings, in which;

Fig. 1 is a plan view of a die embodying the invention;

Fig. 2 is a plan view of a die embodying the invention and having a reentrant portion with a wider throat;

Fig. 3 is a perspective view of the platform of a clicking machine, partly in section, with sheet material and the die of the invention thereon, and

Fig. 4 is an elevational view of the die of the invention illustrating its flexibility.

In Fig. 1 a die is illustrated comprising a thin, narrow and endless strip of metal **10** shaped to correspond to the shape of the edge of a shoe vamp blank. Either or both edges of the strip **10** may be tapered to form a knife edge **11**. A reenforcing member **15** is secured as by spot welding, at one end to one side of the die **10** and at its other end to the inner end of the reentrant portion **12**. A reenforcing member **16** extends between the opposed sections **17** and **18** of the reentrant portion **12** and is secured thereto as by spot welding, electric arc welding or riveting so as to connect said sections substantially midway between the ends of the reentrant portion. In certain dies this permits sufficient flexibility of the sections **17** and **18** at the throat **19** as well as the faces of the reentrant portion to eliminate the danger of breaking the die during the cutting operation. For example, it is satisfactory in a die having an overall length of about 8¾" and an overall width of about 7½" with a reentrant portion having a length of about 5¾" and a throat of about ½" width. The most desirable location for the reenforcing

member 16 relative to the throat 19 will vary in different dies where the shape and size of the die is different and the shape, length and width of the reentrant portion and, particularly, the width of the throat of the latter is different. In any given die, the reenforcing member 16 should be located so that when the die is grasped in one's hands and flexed as indicated in Fig. 4, the opposed portions 17 and 18 at the throat will tilt at least 0.015 to 0.020 of an inch out of their normal parallel positions. In general, the distance of the reenforcing member 16 from the throat 19 will vary inversely with the width of the throat, other conditions being substantially the same. This is illustrated in Fig. 2 where the die is substantially the same as that shown in Fig. 1 except that the throat of the reentrant portion is wider. It will be noted that in the die shown in Fig. 2, the reenforcing member is considerably closer to the throat of the reentrant portion.

Fig. 3 shows the die 10 cutting through a sheet S of leather or other suitable material positioned upon the platform P of a clicking machine. It will be noted that the flexibility of the sections 17 and 18 permits them to be moved in the direction of the arrows during the cutting operation by the cam action of the taper 25 acting against the edge of narrow strip 26 of leather.

I claim:

1. A die for blanking out from sheet material blanks having a reentrant portion, such as shoe vamps, comprising a continuous metal strip shaped to correspond to the out-line of the blank and having its edges lying in spaced parallel planes, one of said edges being a continuous cutting edge, said die having means for reenforcing its reentrant portion and for tying the inner end thereof to at least one side portion of the die to maintain a fixed relation therebetween without connecting the opposed portions of the reentrant portion at its throat and thereby permit limited flexibility of said portions, said reenforcing means including a reenforcing member connecting said opposed portions at a position intermediate the inner end and throat of the reentrant portion.

2. A die for blanking out from sheet material blanks having a reentrant portion, such as shoe vamps, comprising a continuous metal strip shaped to correspond to the outline of the blank and having its edges lying in spaced parallel planes, one of said edges being a continuous cutting edge, and means for reenforcing the reentrant portion of the die while leaving the throat of the reentrant portion unreenforced including a reenforcing member bridging the reentrant portion of the die substantially midway between the ends thereof.

HARRY M. BOLSTON.