July 12, 1949. A. SMITH 2,475,807

PERFORATING MECHANISM

Filed March 1, 1947 2 Sheets-Sheet 1

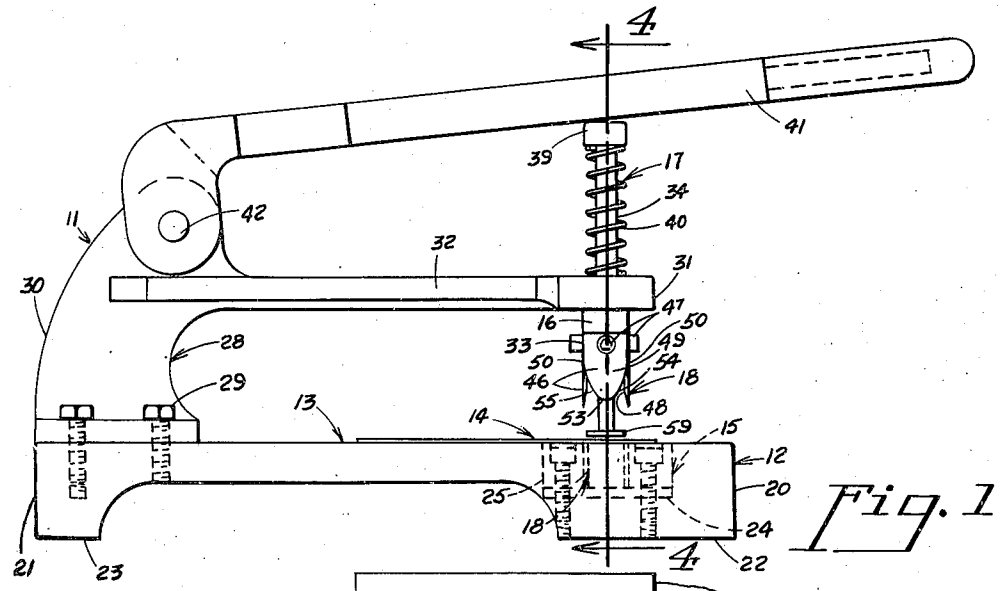


Fig. 1

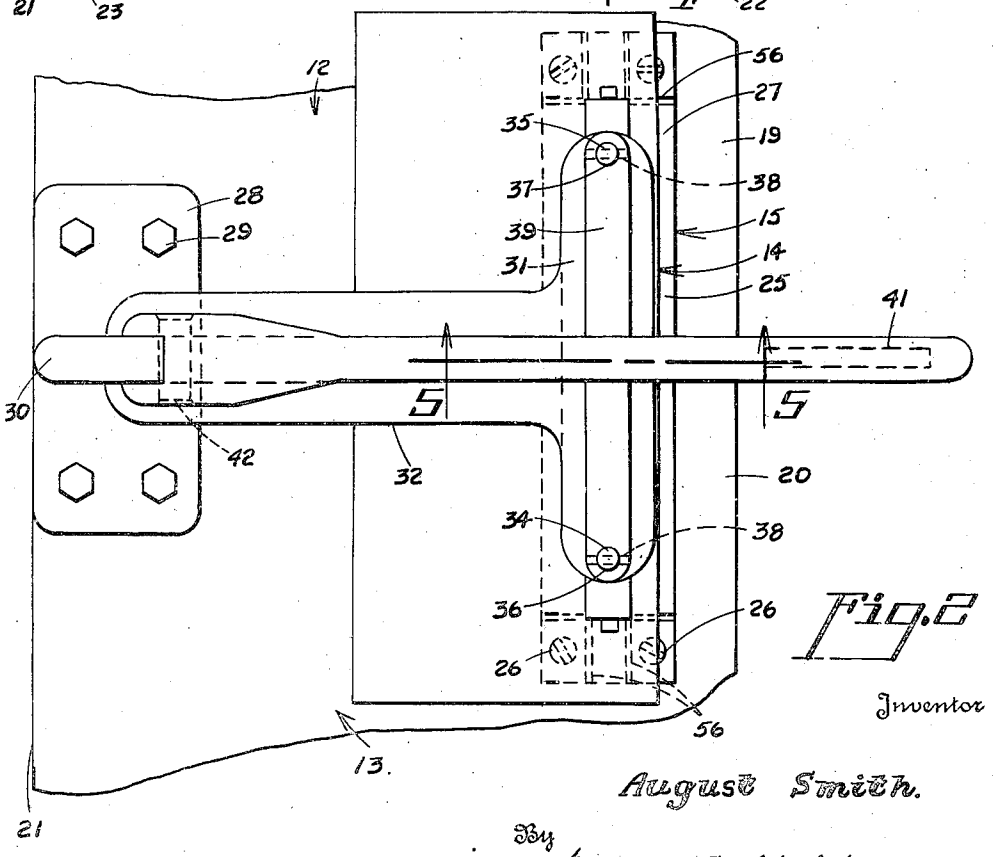


Fig. 2

Inventor

August Smith.

By Murray, Sackhoff & Paddack.

Attorneys.

July 12, 1949. A. SMITH 2,475,807

PERFORATING MECHANISM

Filed March 1, 1947 2 Sheets-Sheet 2

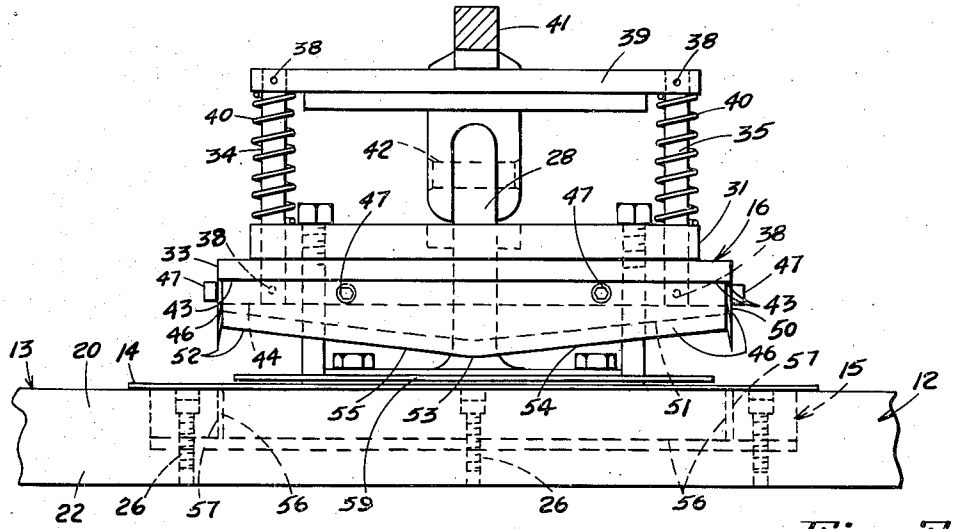


Fig. 3

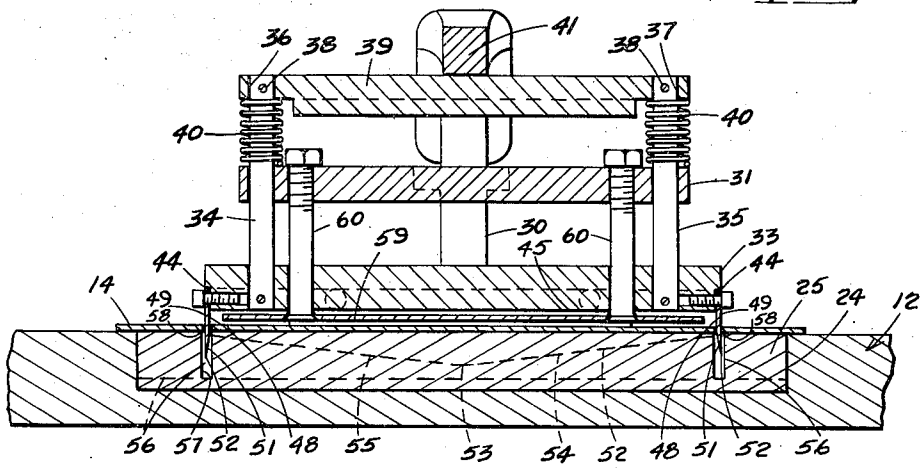


Fig. 4

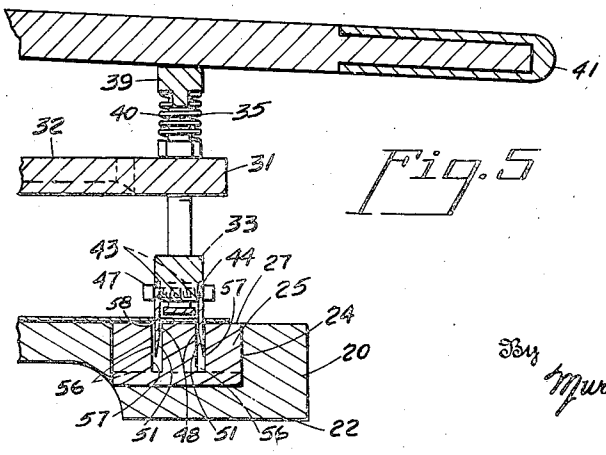


Fig. 5

Inventor

August Smith.

By Murray, Sackhoff & Paddack.

Attorneys.

Patented July 12, 1949 2,475,807

UNITED STATES PATENT OFFICE

2,475,807

PERFORATING MECHANISM

August Smith, Newport, Ky.

Application March 1, 1947, Serial No. 731,835

3 Claims. (Cl. 164—26)

1

This invention relates to perforating mechanisms, and particularly to those devices designed to cut semi-heavy paper stock. The machine here disclosed is specifically directed to the forming of elongated slots in materials used for the manufacture of clothing patterns.

It is the practice of men's clothing manufacturers to cut fabrics by modeling the cloth from patterns made of a semi-heavy paper. These patterns are produced in conventional sizes and are designed to satisfy certain specific measurements. In addition, there may be modeled, from these patterns, clothing, the measurements of which do not meet the dimensions of conventional sizes. This is accomplished by providing an elongated perforation in the body of the pattern, and by printing a graduated scale along the bordering edges of the perforation.

Heretofore, the perforating operation in the manufacture of clothing patterns has been performed with the aid of such tools as a die, a wooden block and mallet. The employment of such tools for cutting heavy paper stock has proven exceedingly difficult, therefore, an object of the invention is to efficiently direct a perforator's energy by the utilization of mechanical power in combination with a novel cutting device.

Another object of the invention is to eliminate the tendency of paper and like materials to gather into folds, or to bunch, when being cut during a paper slotting operation.

Another object of the invention is to provide a means, following a paper slotting operation, to eject the cut out blank in preparation for succeeding operations.

A further object, is to produce a sheet perforating mechanism which is simple and durable in construction, one that requires a comparatively small amount of motive power to operate, the latter being a requisite in a device where large shearing force is necessary to perform the operation demanded.

Further objects and advantages are within the scope of this invention such as relate to the arrangement, operation, and function of the related elements of the structure as are described in the following specification and the illustrated drawings, in which:

Figure 1 is a side elevational view showing my perforating mechanism with the knife blades held in a raised position.

Figure 2 is a top plan view of the mechanism with the longitudinal extension of the base broken away.

Figure 3 is a front elevational view of the device with the actuating lever and base partly broken away.

2

Figure 4 is a sectional view taken on line 4—4 of Figure 1, differing however from Figure 1 in that the device is in a cutting position, and

Figure 5 is a sectional view taken on line 5—5 of Figure 2, differing however from this view by the cutting position of the device.

The invention as disclosed in the accompanying drawings broadly includes a manually operable press 11 having a base 12 that presents a flat surface 13 for the support of paper and like sheet materials 14 to be operated on. Mounted on the press is a pair of opposed die members 15 and 16, one of which is in a fixed position on the base of the press, the other beng disposed on the actuating means 17 of the press. The cutting means 18 of the die members 15 and 16 are so arranged, that upon reciprocation of the means 17, the sheet material 14, positioned intermediate the die members, will be perforated by a co-ordinated shearing action of the cutting means 18.

Referring specifically to the structure of my perforating mechanism, the press 11 comprises a rectangular base 12, which includes the paper supporting surface 13. The longitudinal sides 20 and 21 of the base are extended to provide a pair of depending legs 22 and 23. A recess 24 is located in the supporting surface 13 of the base at a position adjacent the front longitudinal side 20, in which a die block 25 is secured by bolts 26. This recessed die block 25 presents an exposed face 27 that lies in the same plane as the face 13, and thereby forms a continuation of the paper supporting surface 13 of the base. Finally, a standard 28 is mounted to the base 12 adjacent the rear longitudinal side 21 by means of bolts 29.

The standard 28 has an upright member 30, which is held perpendicular with respect to the paper supporting surface 13 and in central alignment with the die block 25. The standard further includes a rectangular cross head 31, which is rigidly projected over the exposed face 27, in a spaced relationship therewith, and by means of an extended arm 32 that juts from the standard 28.

A movable die head 33 is positioned intermediate the exposed face 27 of the stationary die block 25 and the cross head 31, and in this opposed relation to the die block, the die head 33 is adapted for guided perpendicular reciprocation relative to the exposed face 27. To obtain this movement, I provide a pair of spaced slide bars 34 and 35 that are guided by the cross head 31

through bores 36 and 37 provided therethrough, and by fixing the respective terminals of these bars by means of pins 38 to the die head 33 and to a cross bar 39 disposed above the cross head 31. The upward movement or stroke of the die head 33 is impelled by helical springs 40 mounted about the slide bars 34 and 35 so that their resiliency urges the die head 33 away from the die block 25. The downward movement or stroke of the die head 33 is actuated by a manually operable lever 41 pivoted to the upright member 30 of the standard by a pin 42, and by the extended portion of the lever bearing upon the cross bar 39. A downward movement of the lever 41 by an operator, since the cross bar 39 is in the path of travel of its extended portion, will therefore actuate the die head 33 towards the stationary die block 25.

For purposes of perforating an aperture in the sheet material 14 disposed on the paper supporting surface 13 of the base, and to firmly secure the cutting means 18 to the die head 33, there is provided a marginal shoulder 43 formed by an offset surface 44 in the opposed sides of the die head. The edges 45 of the surface 44 substantially describe in outline the elongated rectangular slot to be cut in the clothing pattern 14. Two pairs of opposed knife blades 46 are secured to this surface 44 by bolts 47, and are thereby co-related to form the edges of the slot to be cut.

The opposed depending blades 46 consist of an inner and an outer major face 48 and 49 respectively, and transverse end faces 50. The ends 50 of the blades that are mounted to the longitudinal sides of the die head 33 are in abutment with the inner face 48 of the blades mounted to the transverse sides of the die head. Each blade has a beveled surface 51 on its relatively inner face 48, which forms a cutting edge 52 in the plane of the outer face 49. Each cutting edge 52 of the blades has a relatively obtuse salient point 53 positioned intermediate its ends 50. There is thereby formed on each blade a pair of oppositely inclined shearing edges 54 and 55 that are disposed in the common plane of the outer face 49 of the knife blades.

To further facilitate the perforating action of the knife blades of my device, there is formed in the body of the stationary die block 25 a continuous groove 56 in alignment with the depending knife blades 46 for blade reception on the down stroke of the die head 33. The groove is extended perpendicularly to the exposed face 27 of the die block, and has a relatively outer face 57 that describes a cutting edge 58 with this exposed face. A shearing action by the cutting edges 52 and 58 is obtained upon the paper 14 by the outer face 57 of the groove lying substantially in the plane of the outer face 49 of the knife blades.

A stationary stripper plate 59 is disposed intermediate the die members 15 and 16 for ejecting the paper blanks following the perforating operation. The plate is held in spaced relation to the die block 25 by spaced guide pins 60 that are rigidly secured to the cross head 31. These pins may also serve as guides for the die head 33. The outline of the stripper plate 59 is substantially similar to that presented by the interior major faces 48 of the opposing knife blades 46, but are of a somewhat lesser dimension to allow clearance for the blades in their movement relative to the die block 25.

It is apparent from the drawings and the above description, that a semi-heavy paper stock may be positioned between the stripper plate and the paper supporting surface of the base, and also evident that the cutting edges of the respective die members will provide an efficient shearing action for the perforating of clothing patterns.

What is claimed is:

1. In a paper perforating device, a base having a supporting surface for paper, a die block having an exposed face that forms a continuation of the supporting surface of the base, a rigid cross head mounted to the base and projected over said die block in spaced relation to the exposed face thereof, depending guide pins rigidly mounted to said cross head, a stationary stripper plate fixed to said pins and disposed above the die block in spaced relation thereto, a reciprocable die head mounted intermediate the stripper plate and cross head for guided movement by said pins perpendicular to said exposed face, a cross bar disposed above the cross head, spaced slide bars mounted for guided movement in said cross head and having their terminals fixed to said die head and cross bar, resilient means yieldingly supporting the cross bar away from the die block, a lever pivoted to the base for actuating the cross bar, opposed knife blades secured to the reciprocable die head and co-related to form the edges of the perforation to be cut, each blade being beveled on its inner face to form a cutting edge in the plane of the outer face of the blades, each cutting edge presenting a relatively obtuse salient point intermediate its ends and forming thereby a pair of oppositely inclined shearing edges disposed in the common plane of the outer face of the blades, a continuous groove formed in the die block perpendicular to the exposed face thereof, a relatively outer face formed by said groove, a cutting edge defined by the outer face and the exposed face of the die block, the outlines of which describes the contour of the perforation to be cut in paper disposed on the supporting surface of the base, said outer face of the groove lying substantially in the plane of the outer face of the knife blade.

2. In a paper perforating device, a base having a supporting surface for paper, a die block having an exposed face that forms a continuation of the supporting surface of the base, a rigid cross head mounted to the base and projected over said die block in spaced relation to the exposed face thereof, depending guide pins rigidly mounted to said cross head, a stationary stripper plate fixed to said pins and disposed above the die block in spaced relation thereto, a reciprocable die head mounted intermediate the stripper plate and cross head for guided movement by said pins perpendicular to said exposed face, a cross bar disposed above the cross head, spaced slide bars mounted for guided movement in said cross head and having their terminals fixed to said die head and cross bar, resilient means yieldingly supporting the cross bar away from the die block, a lever pivoted to the base for actuating the cross bar, opposed knife blades secured to the reciprocable die head and co-related to form the edges of the perforation to be cut, a continuous groove formed in the die block perpendicular to the exposed face thereof, a relatively outer face formed by said groove, a cutting edge defined by the outer face and the exposed face of the die block, the outlines of which describes the contour of the perforation to be cut in paper disposed on the supporting surface of the base, said outer face of

the groove lying substantially in the plane of the outer face of the knife blade.

3. In a paper perforating device, a base having a supporting surface for paper, a die block mounted in the base and having a face that forms a continuation of the paper supporting surface, said die block having two intersecting pairs of grooves formed through its upper portion, a rigid cross head mounted upon the base and disposed above the die block, depending guide pins fixed to said cross head, a stationary stripper plate fixed to the lower ends of the pins and disposed above the die block in spaced relation, a reciprocable die head mounted intermediate the stripper plate and the cross head for guided movement by said pins, a cross bar disposed above the cross head, spaced bars mounted for guided movement in the cross head and having their upper ends fixed to the cross bar and their lower ends fixed to the die block, resilient means for yieldingly supporting the cross bar upon the cross head, a lever pivoted to the base for actuating the cross bar, and opposed knife blades secured to the die head and positioned thereon for reception into the pairs of grooves in the die block.

AUGUST SMITH.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
13,920	Rice	Dec. 11, 1855
59,944	Barton	Nov. 27, 1866
77,294	Knapp	Apr. 28, 1868
123,690	Gatchell	Feb. 13, 1872
1,913,119	Joachimczyk	June 6, 1933
2,253,259	Wilson	Aug. 19, 1941
2,412,066	Shear	Dec. 3, 1946

FOREIGN PATENTS

Number	Country	Date
12,826	Norway	Apr. 5, 1904
851,760	France	Jan. 15, 1940