Sept. 20, 1960 G. TREBITSCH 2,953,043

PUNCH PRESS

Filed Aug. 29, 1956 2 Sheets-Sheet 1

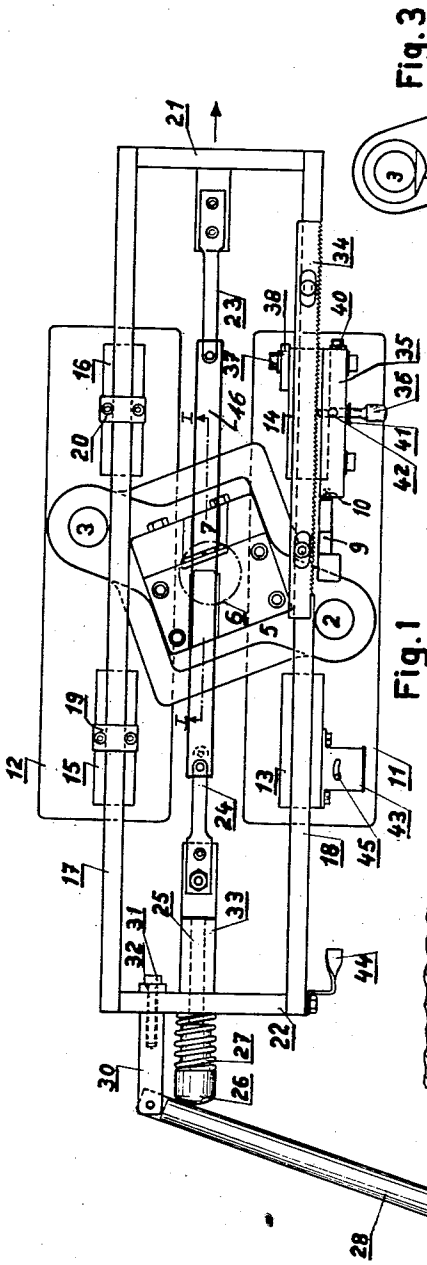

Fig. 1

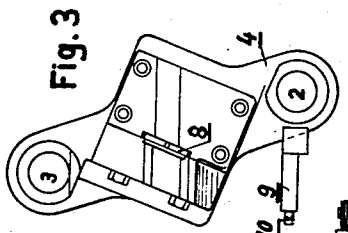

Fig. 3

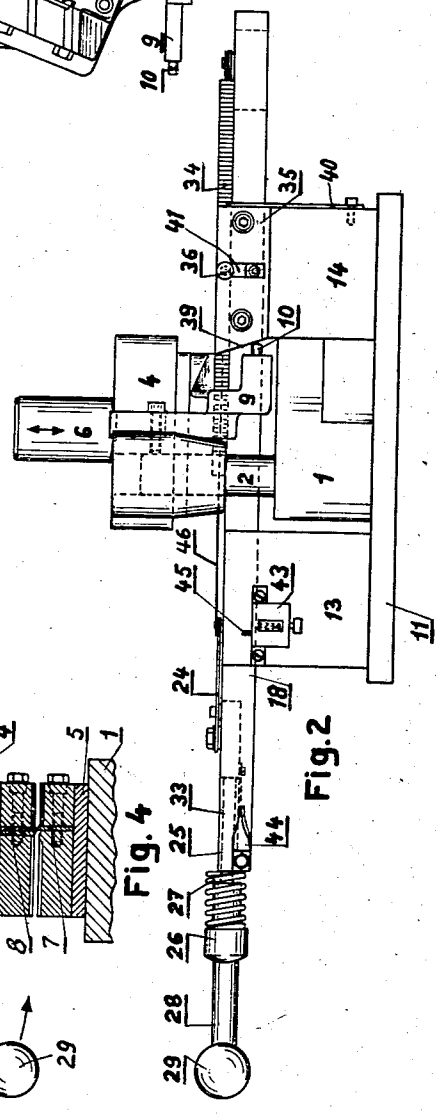

Fig. 2

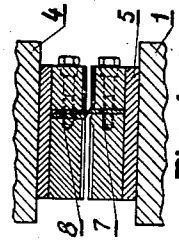

Fig. 4

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Fig 5

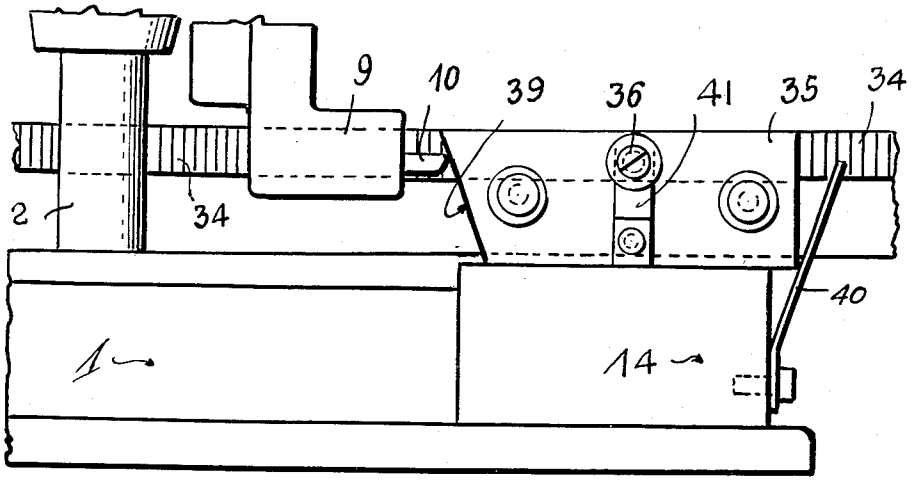
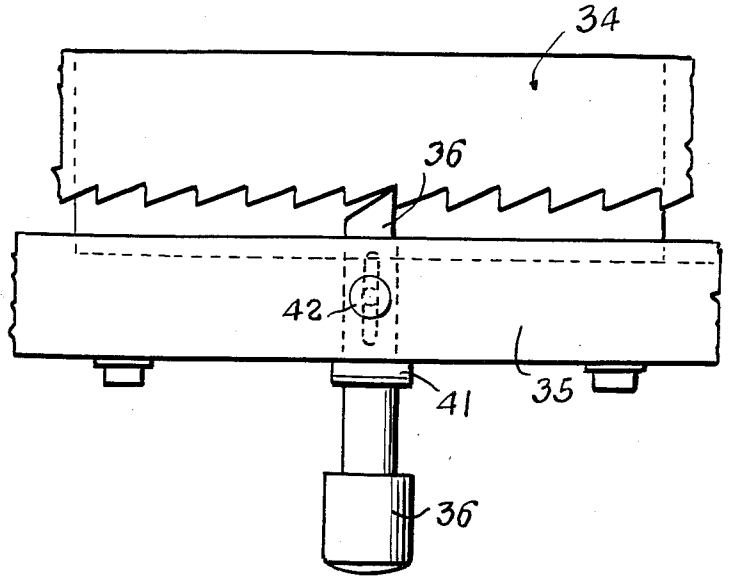


Fig. 6



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PUNCH PRESS

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Claims priority, application Switzerland Sept. 3, 1955

6 Claims. (Cl. 76—12)

This invention relates to a punch press, and more particularly to a punch press adapted to produce the file leaf element of the hollow file described in copending application Ser. No. 438,698, filed June 23, 1954, since abandoned.

It is an object of the present invention to provide a relatively simple and efficient punch press for the automatic, accurate and semi-continuous production of the file leaf elements described in the above-identified application, including means for automatically registering the number of file leaf elements which have been completed by the punch press.

Other objects and advantages of the present invention will become apparent as the description thereof proceeds.

The punch press in accordance with the present invention consists essentially of a pair of parallelly disposed, spaced base plates, four rectangularly disposed supports mounted on said base plates, a fixed base block or anvil centrally disposed with respect to said supports and including a fixed punching blade, a substantially rectangular frame horizontally slidably mounted on said supports and adapted to hold the file leaf blank in the proper punching position, a vertically reciprocating punch member including a punching blade parallelly disposed with respect to said fixed punching blade, means for successively advancing the frame and the file leaf blank held thereby past the punching blades, and means for keeping a running count of the number of blanks which have been finished by the machine. The punching blade secured to the reciprocating punch is displaced with reference to the fixed punching blade in the anvil for instance by an amount equal to the spacing of the filing edges it is desired to cut into the blank. The two parallel punching blades are arranged at an angle to the longitudinal direction of the blank, and this angle may conveniently be about 70°.

The elements of the punch press and their cooperation with each other will be described in detail with reference to the attached drawing, of which—

Fig. 1 is a plan view of one form of construction of the invention, the vertical punch member being removed,

Fig. 2 is a side elevation of the form of construction shown in Fig. 1 with the vertical punch member in position,

Fig. 3 shows the vertical punch member from below,

Fig. 4 is a section along line I—I in Fig. 1,

Fig. 5 is an enlarged, detailed view of the blank advancing means forming part of the present invention, and

Fig. 6 is a further enlarged top view of the rack and wedge member forming part of said blank advancing means.

In the file cutting punch press as shown in Figs. 1 and 2, 1 is the stationary anvil of the punch press, which carries columns 2 and 3 on which the vertical punch member 4 slides. The holder 5 for the punch blade 7 is secured to the anvil 1. In Fig. 3 the punch blade in the movable punch 4 can be seen at 8. The reciprocation of the punch 4 is effected by means of the ram 6 and conventional actuating means not specially shown. The punch 4 is provided with an extension 9 with a pin 10 which in a manner yet to be more particularly described controls the feed of the blank 46 that is to be cut in the machine.

The anvil 1 is rigidly secured to the baseplates 11 and 12. These baseplates carry the supports 13, 14, 15 and 16 for sliding rails 17 and 18 which support and advance the file blank. The sliding rails 17 and 18 are slidably held in the supports 13 to 16 by cross plates such as indicated, in respect to rail 17, at 19 and 20, the cross plates for the rail 18 being omitted for the sake of clarity. The ends of the two sliding rails 17 and 18 are connected by transverse members 21 and 22 with which they form a rigid rectangular frame by which the file blank is held in position.

For the purpose of holding the blank, straps 23 and 24 are attached to the transverse members 21 and 22. To create the necessary tension, one of these straps, for example that numbered 24, is movable. 25 is an adjustable pin which carries a nut 26 against which a spring 27 bears. By turning the nut 26 the pressure of the spring 27 may be controlled whereas the distance between the two straps 24 and 23 may be adjusted by means of the adjustable pin 25. The adjustable pin 25 slides in a bushing 33.

To facilitate fixing the blank 46, provision is made for a lever 28 fitted with a handle 29. The lever 28 is secured to the transverse member 22 on an arm 30 by means of a screw 31 and a washer 32. When the lever 28 is pressed against the nut 26 the spring 27 becomes ineffective and allows the blank to be easily placed in position. The advancing means for the blank are controlled by a device attached to support 14. This consists of a rack 34 secured to the sliding rail 18. The teeth of the rack 34 are engaged by a wedge member 35 through an arresting pin 36. The wedge member 35 engages the sliding rail 18 by means of an adjusting screw 37 and the adjusting plate 38. The surface 39 of the wedge 35 facing the punch 4 is inclined. The arresting pin 36 is transversely slidably mounted in member 35 and is urged toward rack 34 by a leaf spring 41 and is located by a retaining pin 42.

The support 13 also carries the counter 43. At its forward end the sliding rail 18 carries a stop 44 which upon completion of a file leaf comes into contact with the pin 45 of the counter 43 and thereby operates the counter mechanism.

In operation the punch press functions as follows: The ends of the file blanks are fixed to the straps 23, 24. To this end, lever 28 is moved against the adjustable pin 25 or its nut 26, compressing the spring 27 so that the distance between the straps 23 and 24 can be adjusted to the length of the blank.

After the blank has been strapped in position, lever 28 is moved back releasing the spring 27 which therefore, by spring force, causes the blank to be held tightly between the straps 23 and 24.

For cutting the filing edges into the file blade blank 46, the upper reciprocating punch member 4 is moved alternately up and down. During each upward movement the pin 10 attached to extension 9 of reciprocating punch member 4 slides upwardly along the inclined surface 39 of wedge member 35. Since wedge member 35 is slidably mounted on support 14, the action of pin 10 on the inclined surface 39 will cause wedge member 35 to be displaced forwardly, or toward the right in Figs. 1 and 2. Since pin 36 seated in wedge member 35 engages the teeth of rack 34, the forward motion of wedge member 35 will also cause the rack, and therefore the frame holding the blank, to be moved a corresponding distance to the right. The inclination of surface 39 is preferably such that the forward motion of

wedge member 35 caused by the upward movement of pin 10 corresponds to the distance between adjacent teeth on rack 34. The forward movement of wedge member 35 takes place in opposition to the pressure of leaf spring 40 lying against wedge member 35 (Figs. 2 and 5). Thus, when punch member 4 together with extension 9 and pin 10 go through their downward motion, the wedge member 35 slides back into its original position due to the force exerted upon it by leaf spring 40. Since pin 36 is transversely slidably mounted in wedge member 35, it will slide over the adjacent tooth in rack 34 during the return movement of wedge member 35, and as soon as it has passed the ridge of the adjacent tooth, will snap back into the valley behind the tooth by virtue of the counterpressure exerted upon it by leaf spring 41.

Whenever a blank has been completed and provided with filing edges throughout its length the stop member 44 strikes the pin 45 on the counter 43 which then registers the successive number of file leaves that have been completed.

File leaves that are punched out on this apparatus are cut on both sides. Both sides of the file leaf can be used, as described in said copending application.

While I have described one particular, specific embodiment of the apparatus according to my invention, it will be apparent to those skilled in the art that the present invention is not limited to this particular embodiment and that various chanegs and modifications may be made without departing from the spirit of the invention or the scope of the appended claims.

I claim:

1. A punch press for the manufacture of file leaf elements, comprising a base, supports mounted on said base in substantially rectangular relationship with respect to each other, a fixed punching member mounted on said base in substantially central relationship with respect to said supports, said fixed punching member including a single sharp cutting edge defined by a vertical and an inclined surface, a vertically reciprocating punching member mounted above said fixed punching member, said reciprocating punching member also including a single sharp cutting edge defined by a vertical and an inclined surface in parallel relationship with respect to the cutting edge of the fixed punching member, a frame slidably mounted for substantially horizontal movement on said supports, said frame including a pair of longitudinal and a pair of transverse members, resilient means on said frame for holding a sheet metal blank under tension and in a horizontal plane between the cutting edges of said fixed and said reciprocating punching members, a toothed rack mounted on one longitudinal member of said frame, pawl means reciprocatingly slidably mounted on one of said supports adjacent said rack for intermittent engagement of the teeth of said rack, means mounted on said reciprocating punching member for engaging said pawl means and actuating the reciprocating movement of said pawl means, whereby said frame and said sheet metal blank are intermittently and stepwisely advanced in one direction in a horizontal plane.

2. A punch press for the manufacture of file leaf elements, comprising a base, supports mounted on said base in substantially rectangular relationship with respect to each other, a fixed punching member mounted on said base in substantially central relationship with respect to said supports, said fixed punching member including a single sharp cutting edge defined by a vertical and an inclined surface, a vertically reciprocating punching member mounted above said fixed punching member, said reciprocating punching member also including a single sharp cutting edge defined by a vertical and an inclined surface in parallel relationship with respect to the cutting edge of the fixed punching member, a frame slidably mounted for substantially horizontal movement on said supports, said frame including a pair of longitudinal and a pair of transverse members, resilient means on said frame for holding a sheet metal blank under tension and in a horizontal plane between the cutting edges of said fixed and said reciprocating punching members, including a pair of straps extending in opposite directions from the transverse members of said frame, one of said straps being slidably mounted with respect to the other strap, spring means cooperating with said slidable strap to urge the same away from the other strap, and lever means mounted on said frame adapted to release the spring pressure from said slidable strap, a toothed rack mounted on one longitudinal member of said frame, pawl means reciprocatingly slidably mounted on one of said supports adjacent said rack for intermittent engagement of the teeth of said rack, means mounted on said reciprocating punching member for engaging said pawl means and actuating the reciprocating movement of said pawl means, whereby said frame and said sheet metal blank are intermittently and stepwisely advanced in one direction in a horizontal plane.

3. A punch press for the manufacture of file leaf elements, comprising a base, supports mounted on said base in substantially rectangular relationship with respect to each other, a fixed punching member mounted on said base in substantially central relationship with respect to said supports, said fixed punching member including a single sharp cutting edge defined by a vertical and an inclined surface, a vertically reciprocating punching member mounted above said fixed punching member, said reciprocating punching member also including a single sharp cutting edge defined by a vertical and an inclined surface in parallel relationship with respect to the cutting edge of the fixed punching member, a frame slidably mounted for substantially horizontal movement on said supports, said frame including a pair of longitudinal and a pair of transverse members, resilient means on said frame for holding a sheet metal blank under tension and in a horizontal plane between the cutting edges of said fixed and said reciprocating punching members, including a pair of straps extending in opposite directions from the transverse members of said frame, one of said straps being slidably mounted with respect to the other strap, spring means cooperating with said slidable strap to urge the same away from the other strap, and lever means mounted on said frame adapted to release the spring pressure from said slidable strap, a toothed rack mounted on one longitudinal member of said frame, pawl means reciprocatingly slidably mounted on one of said supports adjacent said rack for intermittent engagement of the teeth of said rack, means mounted on said reciprocating punching member for engaging said pawl means and actuating the reciprocating movement of said pawl means, whereby said frame and said sheet metal blank are intermittently and stepwisely advanced in one direction in a horizontal plane, said cutting edges being inclined at an angle of 70° with respect to the direction of the sliding motion of said frame.

4. A punch press for the manufacture of file leaf elements from a sheet metal blank, comprising a support structure, a fixed punching member mounted substantially vertically on said support structure, said fixed punching member having a single sharp cutting edge defined by a substantially vertical and an inclined surface, a vertically reciprocating punching member mounted on said support structure, said reciprocating punching member also having a single sharp cutting edge defined by a substantially vertical and an inclined surface in opposed parallel relationship in respect of the cutting edge of said fixed punching member, a frame slidably mounted for substantially horizontal movement on said support structure, resilient means on said frame for holding a sheet metal blank under tension and in a substantially horizontal plane between the cutting edges of said fixed and said reciprocating punching members, a toothed rack mounted longitudinally on said frame, pawl means

movably mounted on said support structure adjacent said rack for intermittent engagement of the teeth of said rack, and means mounted movably with said reciprocating punching member and operatively associated with said pawl means for actuating the reciprocating movement of said pawl means, whereby said sheet metal blank is intermittently advanced in substantially horizontal direction and is cut in opposite vertical directions by said punching members.

5. A punch press for the manufacture of file leaf elements, from a sheet metal blank comprising a support structure, a fixed punching member mounted substantially vertically on said support structure, said fixed punching member having a single sharp cutting edge defined by a substantially vertical and an inclined surface, a vertically reciprocating punching member mounted on said support structure, said reciprocating punching member also having a single sharp cutting edge defined by a substantially vertical and an inclined surface in opposed parallel relationship in respect of the cutting edge of the said fixed punching member, a frame slidably mounted for substantially horizontal movement on said support structure, resilient means on said frame for holding a sheet metal blank under tension and in a substantially horizontal plane between the cutting edges of said fixed and said reciprocating punching members, including a pair of straps extending in opposite directions, one of said straps being slidably mounted in respect of the other strap, spring means co-operating with said slidable strap to urge the same away from said other strap, and lever means mounted on said frame adapted to release the spring pressure from said slidable strap, a toothed rack mounted longitudinally on said frame, pawl means movably mounted on said support structure adjacent said rack for intermittent engagement of the teeth of said rack, and means mounted movably with said reciprocating punching member and operatively associated with said pawl means for actuating the reciprocating movement of said pawl means, whereby said sheet metal blank is intermittently advanced in substantially horizontal direction and is cut in opposite vertical directions by said punching members.

6. A punch press for the manufacture of file leaf elements from a sheet metal element, comprising a support structure, a fixed punching member mounted substantially vertically on said support structure, said fixed punching member having a single sharp cutting edge defined by a substantially vertical and an inclined surface, a vertically reciprocating punching member mounted on said support structure, said reciprocating punching member also having a single sharp cutting edge defined by a substantially vertical and an inclined surface in opposed parallel relationship in respect of the cutting edge of the cutting edge of said fixed punching member, a frame slidably mounted for substantially horizontal movement on said support structure, resilient means on said frame for holding a sheet metal blank under tension and in a substantially horizontal plane between the cutting edges of said fixed and said reciprocating punching members, a toothed rack mounted longitudinally on said frame, pawl means movably mounted on said support structure adjacent said rack for intermittent engagement of the teeth of said rack, means mounted movably with said reciprocating punching member and operatively associated with said pawl means for actuating the reciprocating movement of said pawl means, whereby said sheet metal blank is intermittently advanced in substantially horizontal direction and is cut in opposite vertical directions by said punching members, said inclined surfaces being at an angle of 70 degrees in respect of the direction of movement of said sheet metal blank.

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