Mar. 6, 1923. 1,447,885

H. J. POOLE

MACHINE FOR CUTTING PAPER, CARDBOARD, AND THE LIKE

Filed Feb. 14, 1921 3 sheets-sheet 1

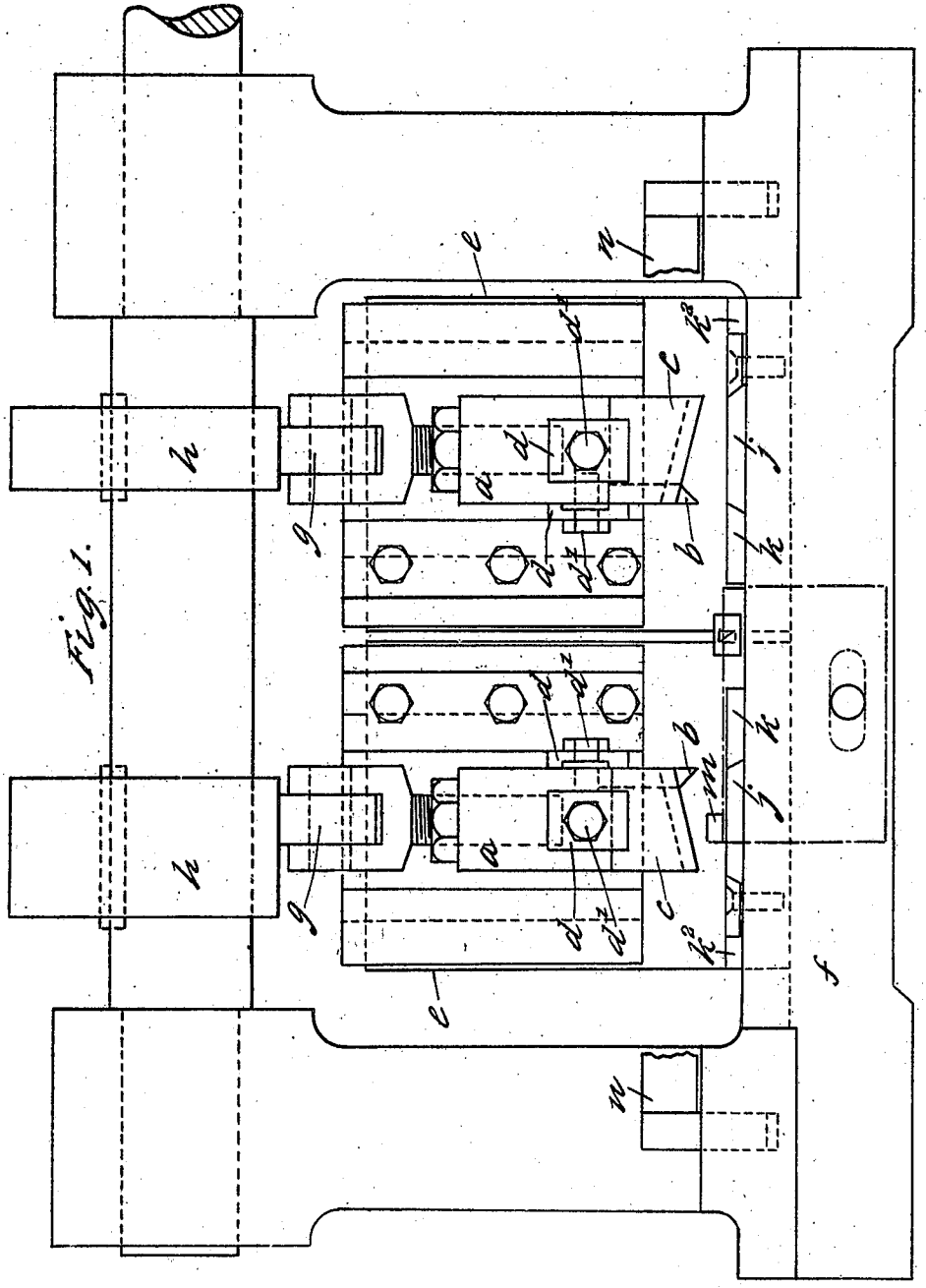


Fig. 1.

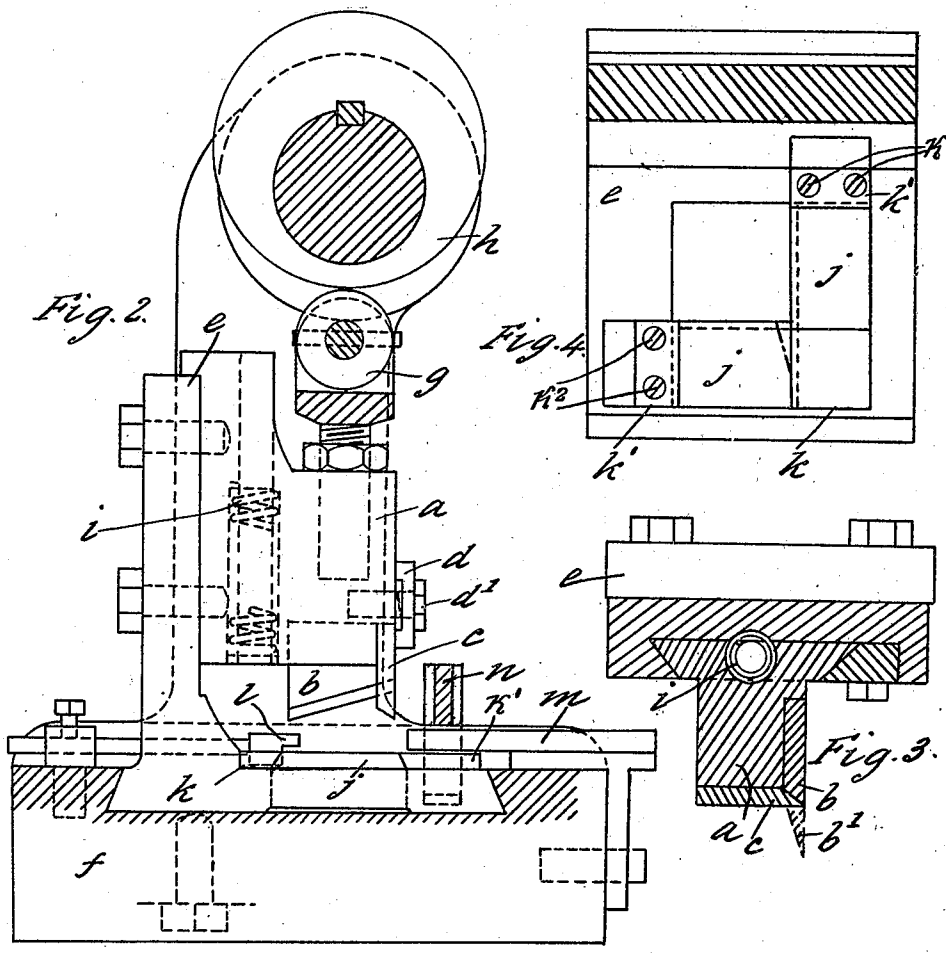
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MACHINE FOR CUTTING PAPER, CARDBOARD, AND THE LIKE

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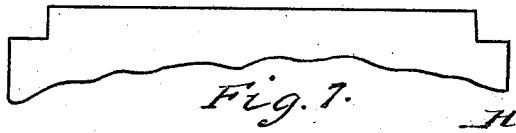


Fig. 1.

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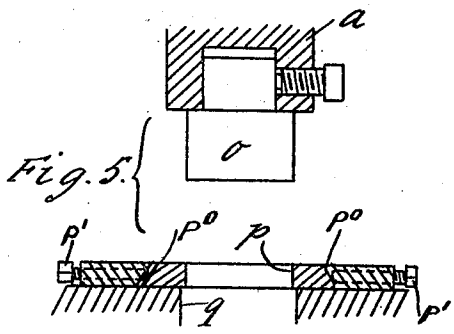


Fig. 5.

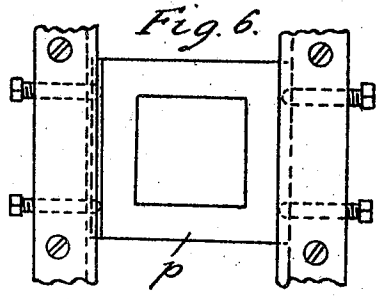


Fig. 6.

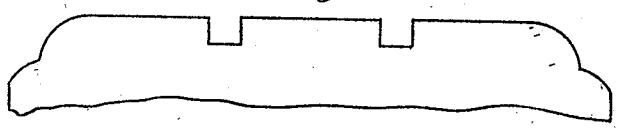


Fig. 8.

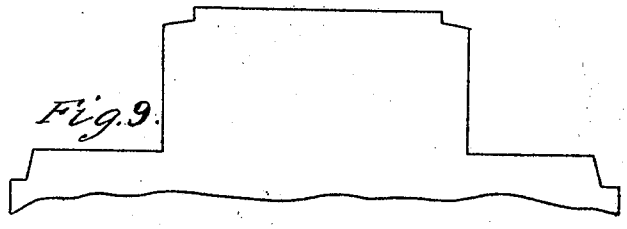


Fig. 9.

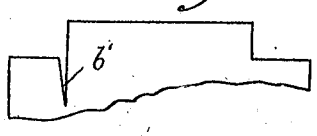


Fig. 10.

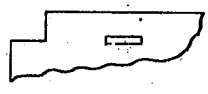


Fig. 11.

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Patented Mar. 6, 1923. 1,447,885

UNITED STATES PATENT OFFICE.

HENRY JEFFREY POOLE, OF LONDON, ENGLAND.

MACHINE FOR CUTTING PAPER, CARDBOARD, AND THE LIKE.

Application filed February 14, 1921. Serial No. 444,812.

To all whom it may concern:

Be it known that I, HENRY JEFFREY POOLE, a subject of the King of Great Britain, residing in London, England, have invented certain new and useful Improvements in Machines for Cutting Paper, Cardboard, and the like, of which the following is a specification.

This invention relates to machines for notching cardboard blanks, as for example in performing one of the first operations on cardboard blanks in the manufacture of cardboard boxes and box lids, viz, cutting out the four corners of the rectangular blank, but the invention may be applied to the cutting or notching of thin materials generally in one or more sheets at a time, according to the thickness of the material. In any case the excision of the four corners or the formation of the notches of whatever shape in the blank is performed in two operations of the machine, half of the notches being made in one operation and the other half after reversal of the blank in the machine, by means of vertically reciprocating cutting or notching devices in conjunction with a corresponding number of fixed cooperating devices.

In the improved machine constituting the present invention provision is made for the relative adjustment not only of the individual blades of each pair which cooperate to cut a notch, but also for the relative lateral adjustment of each pair of reciprocating blades and the associated pair of fixed blades, and of each set of reciprocating blades and associated fixed blades jointly with respect to the other sets of blades in the machine.

The invention will be more particularly described with reference to the accompanying drawings, wherein Fig. 1 is a front elevation of an apparatus embodying the invention adapted to make two rectangular excisions from the corners of a blank at each operation; Fig. 2 is a transverse section; Fig. 3 a horizontal section through one of the guillotines; Fig. 4 a plan view of the fixed cutting device cooperating with a guillotine; Fig. 5 a part vertical section shewing a modified construction of a reciprocating and cooperating fixed cutting device; Fig. 6 a plan view of the latter; and Figs. 7–11 are partial plans of blanks showing various kinds of notches and excisions which may be made with the apparatus.

Referring first to Figs. 1–4, the two vertically reciprocating blade carriers or guillotines *a* have each two blades *b*, *c* disposed at right angles to each other and each adjustable laterally, i. e. horizontally in the plane of the blades, being secured in position on the guillotine by keep plates *d* and set screws *d'*. The guillotines are guided for vertical movement in guideways *e* which are capable of relative lateral adjustment, as for example by being laterally slidable on vertical frames or standards *e'* to which they are secured by studs e^2 passing through horizontal slots in the standards *e'* and engaging the guides *e*. One or both of the standards *e'* may also be mounted to slide sidewise in a bed plate *f*. The guillotines are actuated by the engagement of rollers *g* with cams *h* on the driving shaft of the machine, one of which is shown as being of extra width so as to remain in engagement with the cooperating roller over the full range of relative lateral adjustment of the guillotines. Alternatively the cams may be axially adjustable along the driving shaft or a single cam of sufficient peripheral width may be used. The guillotines which are depressed by the cams to bring the cutting devices into action are raised by means of springs such as *i* accommodated in suitable recesses in the frames and reacting on the guillotines.

The individual blades *j* of each pair of fixed blades are bevelled for cooperation with guideways *k*, *k'*, of which *k'* act also as clamps for the blades, being secured by set screws k^2 to the bases of the frames *e'*. The blades *j* are horizontally adjustable in directions at right angles to their cutting edges and therefore relatively to each other in their guide ways, the limit of adjustment of one of them being determined by its abutment with the other.

An adjustable stop *l* on the bedplate *f* determines the depth of cut from front to rear and a laterally adjustable stop *m* which also serves as a feed guide determines the width of the cut sidewise the blank being inserted from the front of the machine with its left edge abutting on guide *m* (Fig. 1). A finger guard *n* extends along the front of the machine, which may be treadle-operated or power driven.

It will be understood that the character and shape of the cutting devices will depend upon the character of the notch or cut to be made. Thus, the plain rectangular

notches in the corners of the blank shown in Fig. 7 are made by two straight blades set to enclose a right angle. Each of the notches shown in Fig. 10 is made by a similar pair of straight blades, but one of them has a tapering extension b' (indicated in dotted lines in Fig. 3) extending beyond the plane of its fellow blade c, one of the cooperating fixed blades j being chamfered at its front end as indicated by the dotted line in Fig. 4 to leave a gap corresponding with the blade extension b'.

Also the blades, although straight edged, may be set at other angles than a right angle as for cutting the small corner notches in the blank of Fig. 9, or they may be curved or gouge-shaped to cut the curved corner notches in the blank of Fig. 9.

In the modified construction of Figs. 5 and 6 the cooperating cutting devices are more of the character of a male and female die, the former o being removably secured in the guillotine a, and the latter p being removably secured over an aperture q in the base of the frame and being adjustable laterally and as viewed in Figs. 5 and 6 by slacking and setting up the clamping screws p', and fore and aft by sliding the die between the guides p° before setting up the clamping screws, so as to bring it into register with the male die o. Such a modification would be suitable for making the square notches shown in the edge of the blank in Fig. 8 or (with suitably dimensioned dies) rectangular notches or slots such as shown in Fig. 11.

In every case the notching which can be performed by a machine without change or re-adjustment of the cutting devices is effected in two operations between which the blank is reversed in position, the second set of notches being thus a symmetrically disposed repetition of the first set.

Having thus described the nature of the said invention and the best means I know of carrying the same into practical effect, I claim:—

A machine for cutting cardboard blanks and other thin sheets by the cooperation of reciprocating and fixed cutting devices, comprising two pairs of reciprocating blades and two pairs of fixed blades cooperating with the respective pairs of reciprocating blades, means for adjusting one set of reciprocating blades with its cooperating fixed blades laterally relatively to the other sets of blades, means for adjusting each pair of fixed blades relatively to the cooperating pair of reciprocating blades, and means for adjusting the individual blades reciprocating and fixed, relatively to each other.

In testimony whereof I have signed my name to this specification.

HENRY JEFFREY POOLE.