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CUTTING APPARATUS

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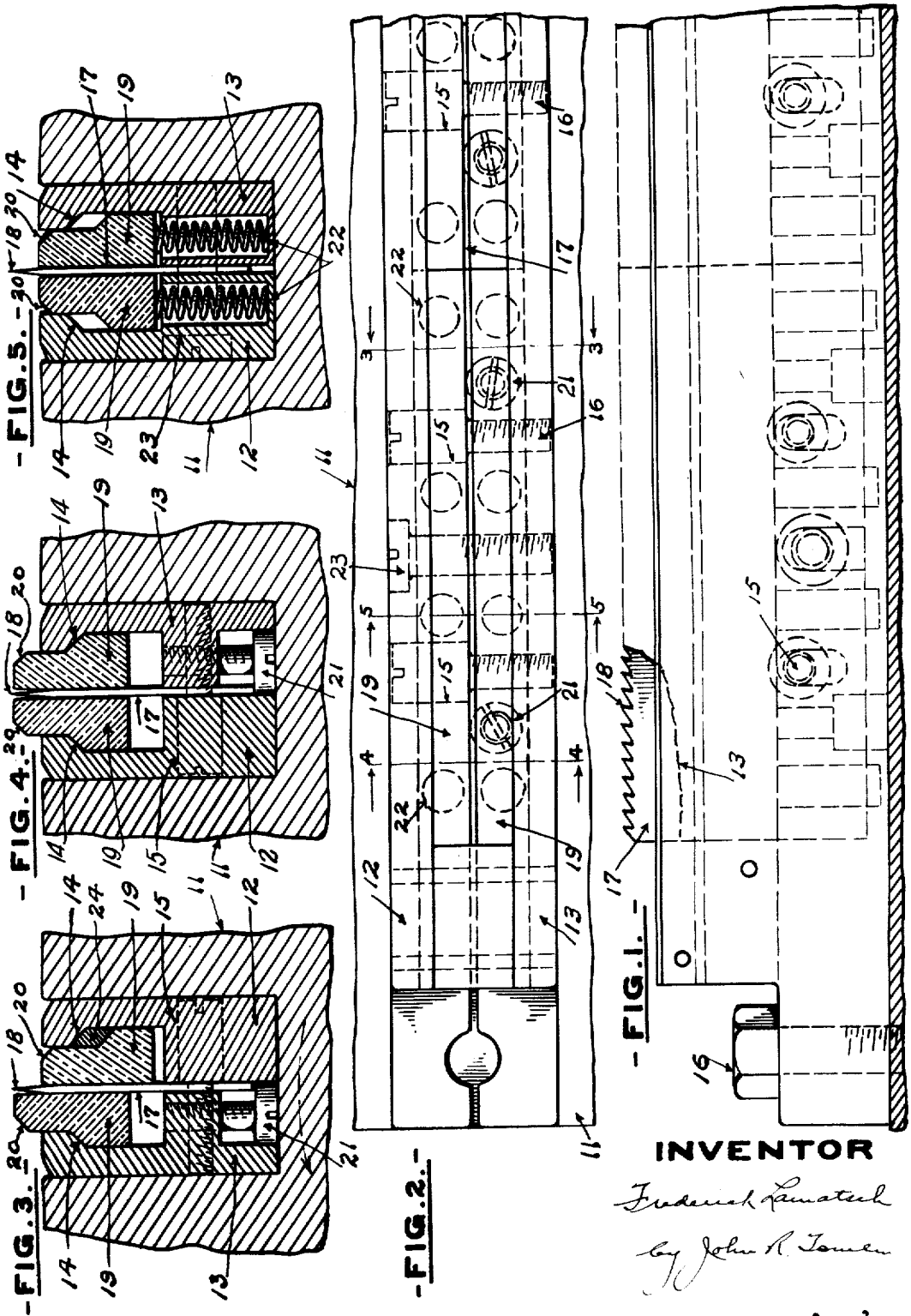


FIG. 5.

FIG. 4.

FIG. 3.

FIG. 2.

FIG. 1.

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CUTTING APPARATUS

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5 Claims. (Cl. 164—66)

My invention relates to improvements in cutting apparatus with particular reference to mechanism for use in connection with printing machines of the rotary type which deliver long webs to the cutting and folding apparatus including the paper cutting and collecting and the folding cylinders thereof.

Prior apparatus of this kind has a cutting knife, generally made of metal, and with a sharp and preferably serrated cutting edge, supported by cheek blocks on either side, contained in a knife holder mounted peripherally of the cutting cylinder.

The prior cheek blocks have been perforated with numerous, preferably slotted, holes to receive stop pins or bolts, which are mounted in the holder, to delimit their movements and have also had notches in their upper and outer portions to accommodate the usual collecting pins or other apparatus and as these cheek blocks are made of yielding or frictional and rather weak substances, such as semi-soft rubber, semi-hard rubber, wood, bakelite or other materials, such holes, perforations or notches cause weakness and breakage in use.

It is one of the objects of my invention to form each cheek block integral and without perforations or notches, and to limit its movement by a flange or projection on the metal knife holder adapted to contact with a flange or enlargement on the inner portion of the cheek block. My invention also includes means for holding one of the cheek blocks in lowered position, so as not to interfere with the delivery of paper to the cutting and collecting cylinder when it is desired to have the paper delivered thereon, and so as not to interfere with the collecting pins which are used in certain cases to engage the sheets of paper to aid in pulling them forward.

Referring now to the several figures on the drawing:—

Fig. 1 is a side elevation;

Fig. 2 is a plan view;

Fig. 3 is a cross sectional elevation on the line III—III, showing one cheek block in outward position while the other is held in lowered position;

Fig. 4 is a cross sectional elevation on the line IV—IV showing both cheek blocks in outward position and;

Fig. 5 is a cross sectional elevation, showing both cheek blocks in lowered position, all these sectional elevations being viewed in the directions of their respective arrows shown on Fig. 2.

Referring now to the characters of reference on the drawing:—

11 is a portion of a cutting and collecting cylinder rotatably mounted on a shaft, not shown, 12 is one portion of the knife holder and 13 is the other companion portion, these being held in a groove in the cylinder 11 by hold down bolts, one of which is indicated as 16.

The knife holder is made in two parts for ease of assembly and otherwise and each of its two portions 12 and 13, is provided with an overhanging re-entrant edge or inturned flange 14 which serve to retain the cheek blocks 19 and delimit their outward movement by contact with their enlarged inner ends or outward projections as clearly indicated in Fig. 4.

The two portions of the knife holder 12 and 13 are clamped together by the bolts 15 and 23 to hold them in operative position and to securely clamp and hold the knife 17 therebetween. The knife 17 has a sharp upper edge 18 which is preferably serrated as shown at the left hand portion of Fig. 1.

On each side of the upper portion of the knife are the cheek blocks 19 which have enlarged lower portions, the outer and beveled surfaces of which are adapted to contact with the overhanging flanges 14 of the holders, and are thereby limited in their outward movement.

I prefer to form these cheek blocks with beveled surfaces on the upper or outer portions of their enlarged inner ends, as shown, to contact with similarly beveled or relatively sloping surfaces on the overhanging or inturned flanges 14 of the knife holder in order to avoid sharp re-entrant angles therein and thereby provide cheek blocks of greater strength, and ones which are less liable to breakage.

The outer upper surfaces of the cheek blocks are also beveled as at 20 in order to better clear the paper and prevent interference with its movement.

Adjusting screws 21 are provided to adjust the knife, and to raise it to the required extent when reduced in width by sharpening or to accommodate knives of different sizes.

The cheek blocks 19 are supported on springs 22, which normally hold them in outward position in order to clamp and hold the paper or the plies of the same against another cylinder or surface provided with a knife die or abutment of the female type, not shown, but which may be any of the usual forms of such constructions.

As shown in Fig. 3 a hold down rod 24 is inserted in the opening, between the enlarged portion of the cheek block 19 and the overhanging part 14 of the knife holder. This hold down rod or retainer may be of any form of section, such as round, square, rectangular or rhomboidal as shown, so long as it contacts with the cheek block and the holder to maintain a cheek block in lowered and inoperative position.

The rotary paper cutting knife shown, is adapted to cut various plies of paper as it passes, in conjunction with another adjacent cylinder or surface, or abutment, against which the paper is

held by the spring pressed cheek block or blocks 19 in order to clamp and hold it without undue bending, buckling or distortion, so as to produce a clean and exact severance.

When the paper or the plies of the same pass around and are delivered from a folding cylinder, or one which carries a companion or female knife or die opposing the one illustrated and described herein, both of the cheek blocks 19 are operative to clamp the paper on each side of the knife 18 and this is facilitated by their somewhat yieldable character and the spring pressure to which they are subjected.

In this case, the outward position of the cheek blocks is shown in Fig. 4 and their extreme inward position is shown in Fig. 5. When a number of plies of paper are being clamped or held by the cheek blocks, their position would be intermediate of those shown in Figs. 4 and 5, dependent on the thickness of the plies of paper to be cut.

My cheek blocks are also adapted for use under other conditions as follows:—

When each alternate group of sheets is led around the folding cylinder and the next one is carried around the cutting and collecting cylinder in order to meet, register with and join the first-mentioned adjacent ones on the folding cylinder, if both cheek blocks should extend outwardly as shown in Fig. 4 the lagging or trailing one would interfere with the proper handling of the paper.

This is due to the fact that the thickness of the plies of paper which are impaled on the usual or collecting pins of the cutting and collecting cylinder require the full lengths of pins to perforate and grasp all the sheets to hold them during their revolution. If the trailing cheek block should project or be projected under such conditions it would prevent the pins from grasping all the sheets or would push the sheets or the outer ones off the pins and disarrange and mutilate them.

All this is obviated by my invention, as in such cases I make the cheek blocks and holder of such construction and conformation that a cheek block can be held down in inoperative position.

In this case, if the rotation of the cylinder 11 is in the direction of the curved arrow in Fig. 3 the right-hand or trailing cheek block is therefore held down in inoperative position by the insertion of the hold down bar 24 into the space shown, which obviates the difficulties above mentioned and insures constant and correct operation.

What I claim is:

1. A rotary cutting cylinder provided with a peripherally mounted knife holder having inturned outer edge portions, yielding cheek blocks mounted therein, adapted to be delimited in their outward movement by said portions, a knife supported between said cheek blocks, and means for insertion between said cheek blocks and said inturned edge portions for holding one of said blocks in inoperative position.

2. In a rotary cutting apparatus, a knife holder with inturned outer edge portions, a knife mounted therein and between a pair of cheek blocks yieldingly supported in said knife holder, said cheek blocks having enlarged or flanged inner portions adapted to contact with said inturned edges to delimit their outward movement, and a hold down bar abutting one of said enlarged portions and said outer edges, to thereby hold one of the cheek blocks in its inner or inoperative position.

3. In a rotary cutting apparatus, a knife holder with inturned flanges on its outer edges, a pair of spring supported cheek blocks mounted therein with their inner portions conforming thereto, a knife blade fixed between said cheek blocks, and a hold down rod between one of said flanges and the inner portion of a cheek block to hold it in inoperative position.

4. A rotary cutter, comprising a knife holder with inturned flanges, a knife blade mounted therein, yieldable cheek blocks on either side of said knife and provided with projections on their inner portions adapted to contact with said flanges, and means cooperating with said projections to hold a cheek block in lowered or inoperative position.

5. In a rotary cutting apparatus, a rotatably supported cylinder, a knife secured in the cylinder with its edge projecting beyond the periphery thereof, a resiliently supported cheek block positioned against the leading side of the knife and normally projecting beyond the cylinder, a resiliently supported cheek block positioned against the trailing side of the knife and normally projecting beyond the cylinder, and locking means for securing the trailing cheek block with its outer surface substantially flush with the peripheral surface of the cylinder.

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