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A. W. MITCHELL.

CUTTING MECHANISM FOR PAPER BOX MACHINES.

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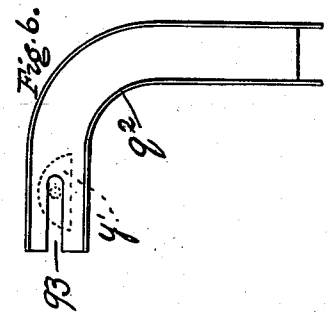

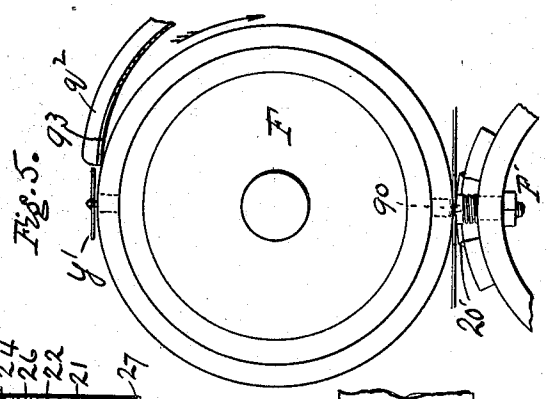

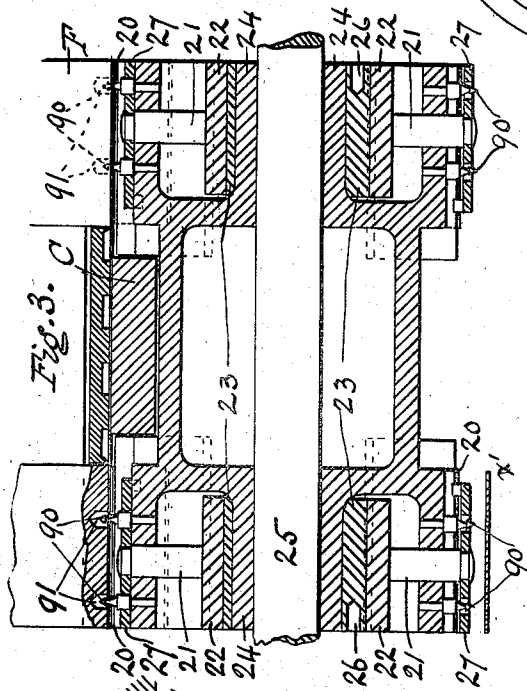

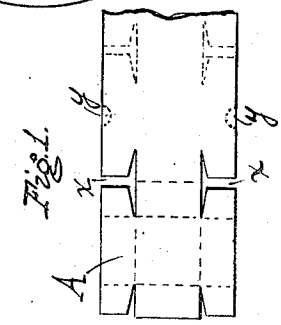

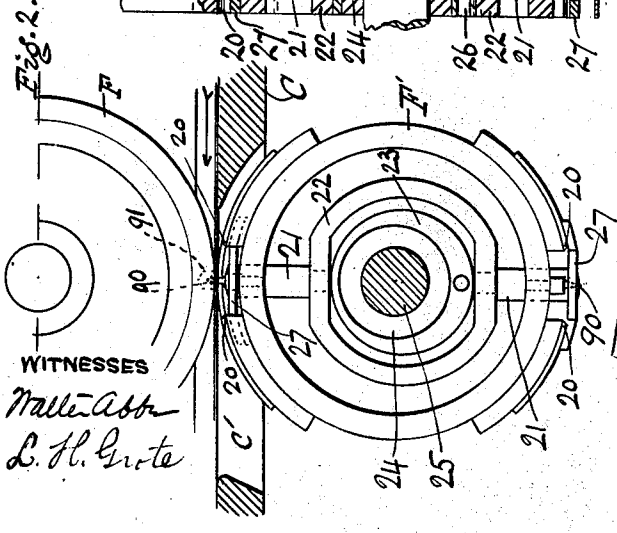

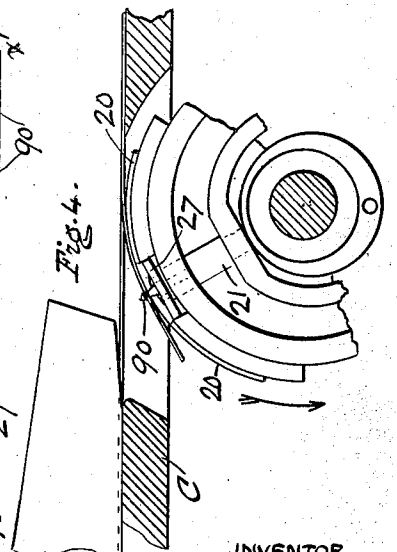

WITNESSES

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CUTTING MECHANISM FOR PAPER-BOX MACHINES.

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Application filed March 14, 1907. Serial No. 362,318.

To all whom it may concern:

Be it known that I, ALBERT W. MITCHELL, a citizen of the United States of America, residing in the city of New Haven, in the county of New Haven, in the State of Connecticut, have invented certain new and useful Improvements in Cutting Mechanisms for Paper-Box Machines, of which the following is a specification.

My invention relates more particularly to that class of cutting mechanisms which are applied to paper box machines and the like for cutting out notches from a web of paper to form the blanks to be folded up into box-like form, and the essential purpose of my invention is to provide a means for removing with certainty the pieces or chips which are notched out by the cutters.

In the accompanying drawings Figure 1 is a diagram drawn to a small scale to illustrate a known form of paper box blank and the manner of cutting notches therein, preparatory to folding; Fig. 2 is a vertical section, showing a pair of coöperating rolls for cutting and provided with my invention; Fig. 3 is a longitudinal section through the lower roller, the upper one being shown partly in section; Fig. 4 is a sectional view corresponding to Fig. 2, but showing the lower roller partly turned from the position Fig. 2; Fig. 5 is a view illustrating the application of my invention to the upper roll for removing the chips formed in making thumb notches; and Fig. 6 is a plan view of a chute for carrying off these chips clear of the rolls.

Referring to Fig. 1, the web of paper is shown as with notches x, x, cut in it for the formation of the box blank A, which is to be folded up in the scoring, which is indicated by dotted lines. Where the blanks are to be used to form box bodies, these notches x are the only notches which are needed, but where they are to form box covers, finger or thumb notches as indicated by dotted lines at y are also to be cut. Whatever be the form of the notches, it is important that the cut-out "chips" should be stripped or cleared away from the web and also from the cutters, and this has always been a source of trouble.

Referring to Figs. 2, 3 and 4, C is the bed plate or table of the machine, and F and F^1 are the upper and lower rollers by means of which the notching of the web of paper is effected. The upper roller is in this instance a cylinder of metal with a plain surface. The lower roller F^1 has its opposite ends of larger diameter than its intermediate portion and projecting up through slots C^1 in the bed of the machine to coöperate with the correspondingly enlarged ends of the roller F. The lower roller F^1 carries at its opposite ends knives 20, preferably two pairs, of an outline corresponding with the notches x to be cut out of the edges of the web. Within each of these knives is a stripper or ejector 27 mounted on a stem 21 guided in a radial hole formed in the wall of the roller. Each stem 21 is mounted on a yoke 22, embracing an eccentric 23, within which turns the hub 24 of the roller F^1. This eccentric 23 is held from turning by suitable means, such as a pin projecting from the fixed bearing for the shaft 25 of the roller F^1 this pin entering an opening 26 in the eccentric. The eccentric is so mounted that at the upper side of the roller where the cutters contact with the upper roller F, the ejector 27 is withdrawn into the roller F^1, while the diametrically opposite ejector 27 at the bottom or under side will at that time be projected. As the two rollers are geared to revolve at the same surface speed, the cutters 20 will cut out from the opposite edges of the web of paper being fed through in the direction of the arrows, Fig. 2, pieces, say of the shape of the notches x, Fig. 1, and such cut-out chips being carried around with the cutter roller F^1, (Fig. 4), will later be ejected or stripped off by the action of the eccentrics 23 upon the ejectors 27. To insure these cut-out pieces or chips being carried away from the web of paper, I provide pins 90, which are preferably barbed and are set radially into the lower roller F^1 within the cutters 20, and project freely through openings in the ejectors 27, in such a way that as the paper is fed between the rollers, the barbed points of these pins will pierce those parts of the paper which will become the cut-out chips and harpoon them, as it were. Recesses 91, (Figs. 2 and 3) are formed in the upper roll to receive the barbed points. The cut-out chips thus securely caught are carried around with the lower roller F^1, (Fig. 4) until stripped or forced off the pins by the ejectors 27 at the under side

of the roller, as indicated at x^1 at the left of Fig. 3.

The barbed pins may be carried by either of the rollers F or F^1. Thus, for cutting the thumb notch y, (Fig. 1), I have shown in Fig. 5, how the pins 90 may be mounted on the upper roller F, while the cutter 20^1 is carried by the lower roller F^1. Instead of ejectors 27 to force the cut-out chips y^1 from the pins, I may provide a stationary device which strips the chips off at the upper side of the roller. This device, q^2, I have shown in sectional elevation in Fig. 5 and in plan, Fig. 6, as consisting of a stationary chute with a slot 93 at its entering end for the free passage therethrough of each pin 90, while the cut-out chip y^1 (indicated by dotted lines in Fig. 6) is caught by the floor of the chute, which is set at such an inclination to the circumference of the roller F, as to strip the chip from the barbed point as the roller F, turning in the direction of the arrows, carries the pin past the end of the chute. This chute q^2 is bent as shown in plan view, Fig. 6, to carry the chip to one side of the frame of the machine.

I claim as my invention

1. The combination of two coöperating rollers, one having means for cutting pieces out of a web fed between them, with pins on one of the rollers to pierce said pieces, and means for stripping the caught pieces from the pins at another point in the rotation of the rollers.

2. The combination of two coöperating rollers, one having means for cutting pieces out of a web fed between them, with barbed pins on one of the rollers to pierce said pieces, and means for stripping the caught pieces from the pins at another point in the rotation of the rollers.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses.

ALBERT W. MITCHELL.

Witnesses:

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W. J. SMITH.