(No Model.) 3 Sheets—Sheet 1.

W. C. CROSS.

PAPER BAG MACHINE.

No. 246,373. Patented Aug. 30, 1881.

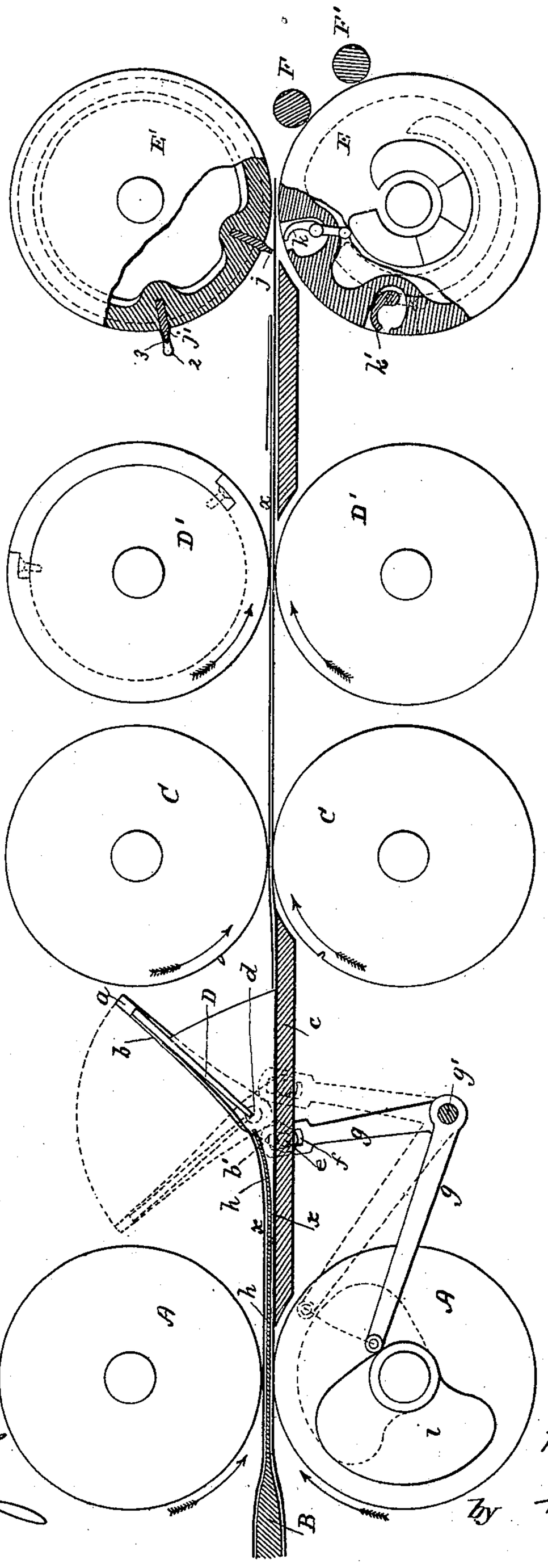

Fig. 1.

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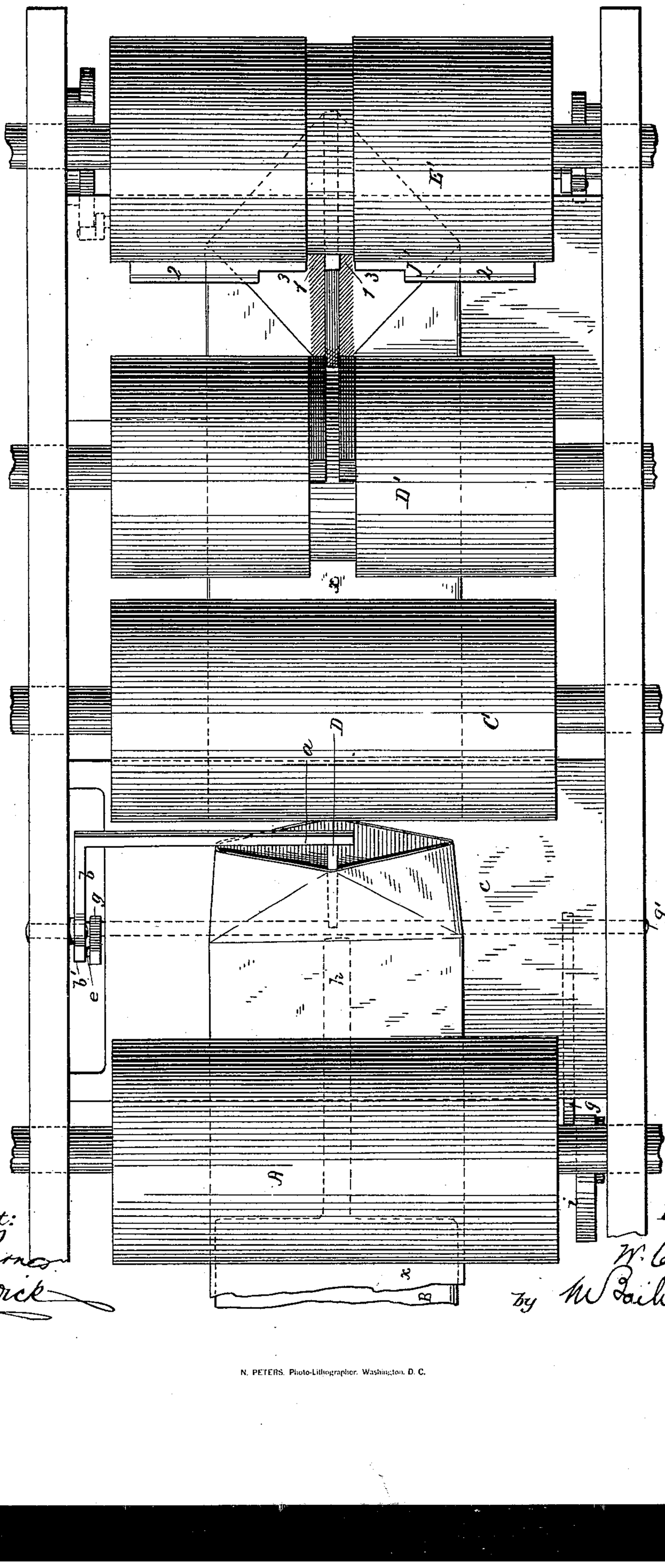

Fig. 2.

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Fig. 3.

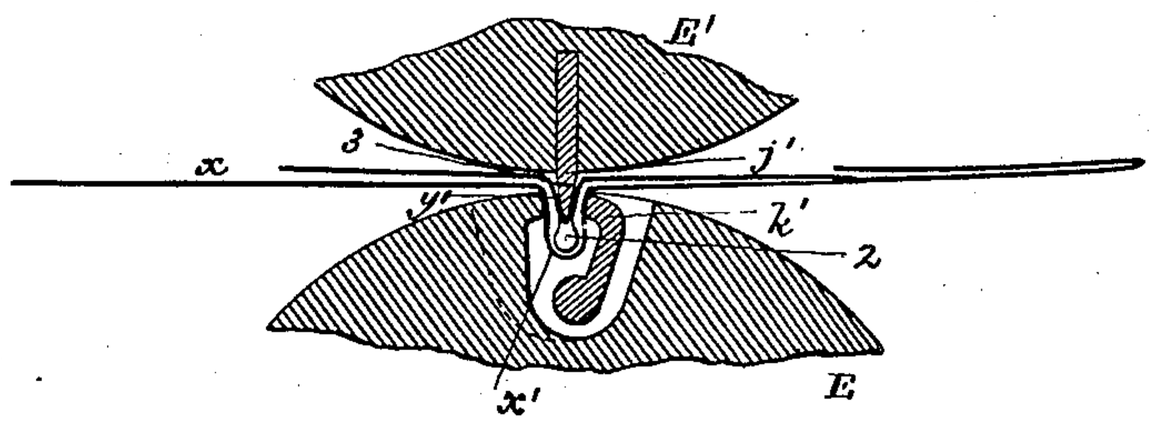


Fig. 4.

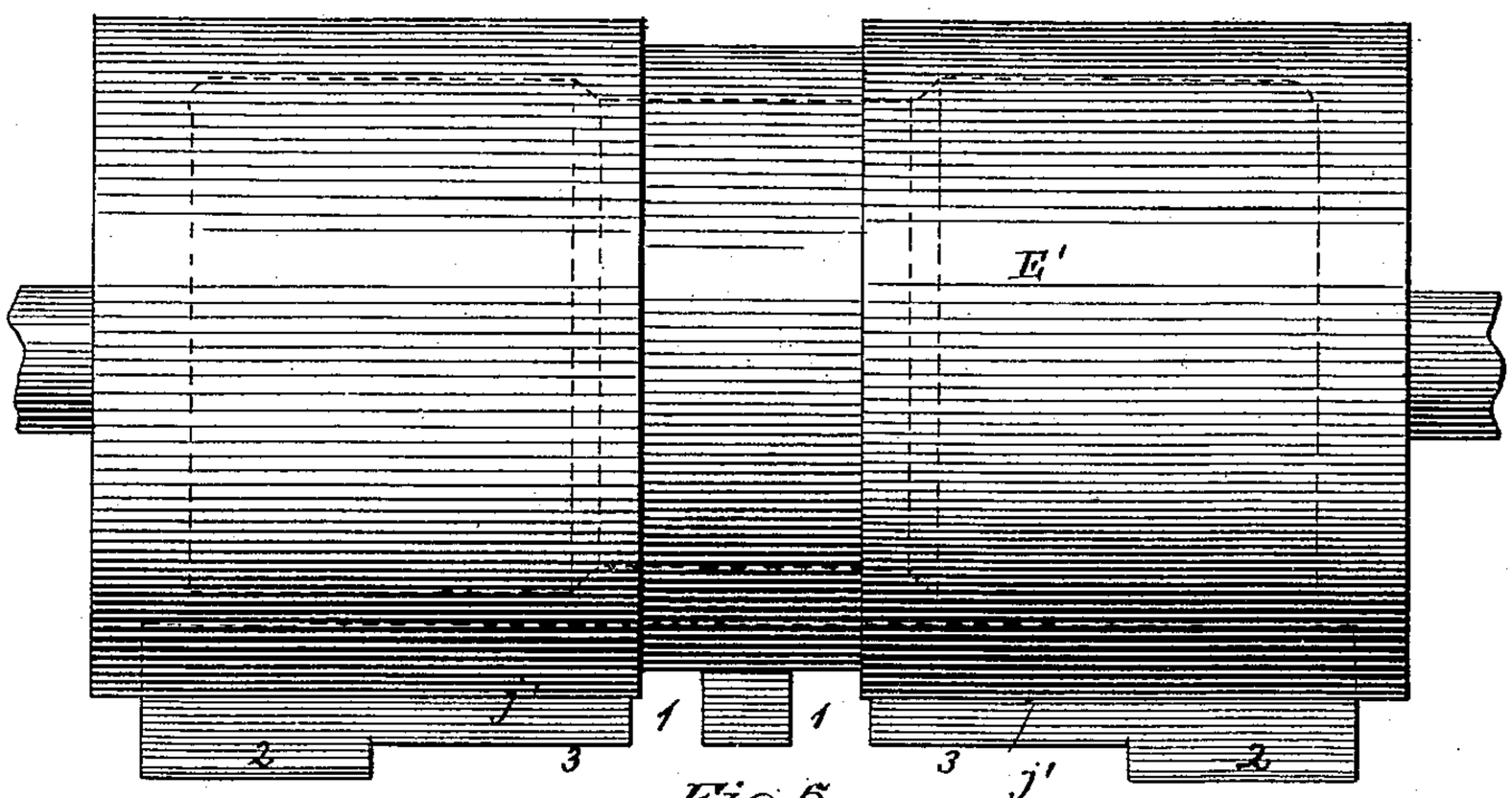
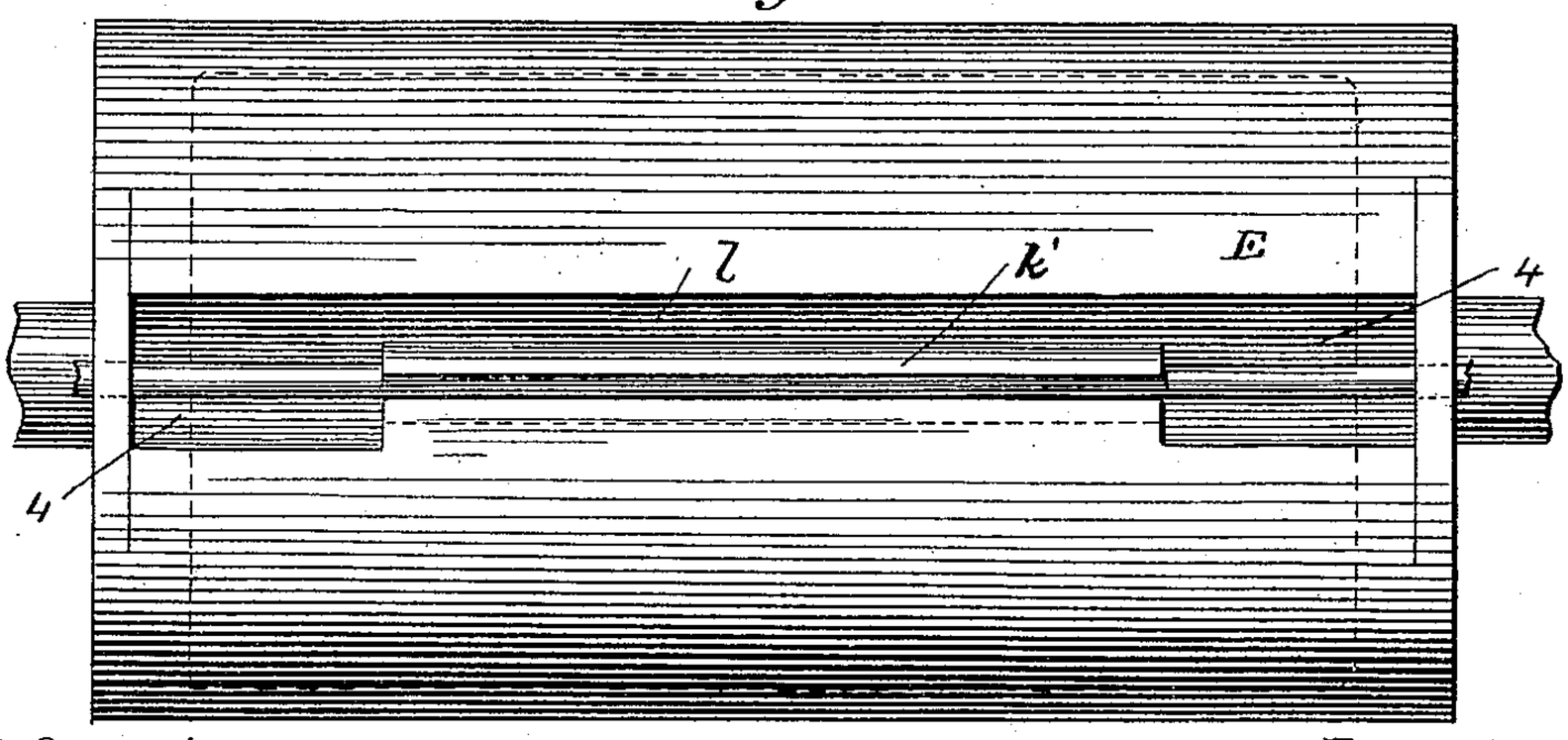


Fig. 5.



Attest:
R. F. Barnes.
C. F. Dick

Inventor:
W. C. Cross
by W. Bailey his Atty.

UNITED STATES PATENT OFFICE.

WILLIAM C. CROSS, OF BOSTON, MASSACHUSETTS.

PAPER-BAG MACHINE.

SPECIFICATION forming part of Letters Patent No. 246,373, dated August 30, 1881.

Application filed July 16, 1881. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM C. CROSS, of Boston, Massachusetts, have invented certain new and useful Improvements in Machinery for Making Paper Bags, of which the following is a specification.

My invention relates to machinery for making satchel-bottom paper bags; and it consists in certain improvements in the devices used for the purpose of making and laying the folds of the satchel-bottom. In forming the first or diamond fold I make use (for the purpose of holding back one ply of the flattened tubular blank) of a vibratory retaining-finger, upon which the said ply rides and by which it is partially turned back, while the other ply moves forward into the bite of the rolls, which lay back and press down the partially-turned ply and form and complete the diamond fold. The blank moves forward uninterruptedly during the formation of the diamond fold, which is not completed until after it has passed between the pressing-rolls, and it is thence delivered to the devices which make the second and the final folds of the satchel-bottom. It is desirable on some accounts to make the folds last mentioned by means of clamping-jaw rolls and blade-rolls similar to those described in my Letters Patent No. 243,857 or No. 243,858, of July 5, 1881; but in using these instrumentalities for folding the rear flap of the diamond, or that flap which overlies the body of the bag, a blind fold is formed in the bag, which, although it can be straightened out afterward, nevertheless leaves a crease in the bag-body.

My present improvement in mechanism for folding this flap of the diamond is intended to avoid forming a blind fold in the bag at the time the flap is folded by the conjoint action of the blade-roll and the clamping-jaw roll; and to this end it consists in so forming the rolls and the flap-folding devices that the body of the bag will at the time the flap is folded be pushed down into a recess in the jaw-roll to such an extent that the loop or bend of this pushed-down portion will be below and out of the way of the acting end of the jaw, so that the latter will pinch and fold the flap of the diamond only. In this way I avoid making any fold in the bag-body, the latter, when the satchel-bottom is completed, being free from the crease which marks a satchel-bottom bag in which a blind fold has been made.

The nature of my improvements and the manner in which the same is or may be carried into effect can best be explained and understood by reference to the accompanying drawings, representing a machine containing the several features of my invention.

Figure 1 is a side elevation, partly in longitudinal vertical section, of so much of the machine as is needed to illustrate my improvements. Fig. 2 is a plan of the same. Fig. 3 is a section on enlarged scale of those parts of the pair of fold-forming rolls which make the final fold. Fig. 4 is an elevation on enlarged scale of the blade-roll. Fig. 5 is a plan on a like scale of the clamping-jaw roll.

A A are power-driven continuously-revolving feed-rolls, which receive and draw along the flattened paper tube *x*, made from the web and formed on the former or truck B in the usual way. These rolls are preferably provided with creasing ribs and grooves to crease the mouth end of the blank along the lines which determine the diamond fold, as described in my Letters Patent of May 3, 1881, No. 240,972, and they also act as cutters to sever the tube into bag-lengths, being provided for this purpose with cutting mechanism of any usual kind, (not deemed necessary to show,) which cuts the upper ply, and also all of the under ply save a narrow portion at the center, which serves to connect one blank with another, this narrow part being subsequently severed by a cutter carried by the pressing-rolls C, which press down and complete the diamond fold.

Intermediate between the two pairs A and C is the vibratory ply-retaining finger D, hereinbefore referred to. This finger is fast at its upper end to a horizontal cross-bar, *a*, which projects from the upper end of a vibratory arm, *b*, on one side of the machine, so as to overhang the table *c*, over which the paper blanks pass from one pair of rolls to the other. The finger extends down from the cross-bar to within a short distance of the table, and its lower end comes above the longitudinal center of the blank. Arm *b* is hung on a stud or pivot, *d*, on the machine-frame, and is extended below the pivot, as indicated at *b'*, this extension being provided with a laterally-projecting pin,

e, which enters and engages a slot, *f*, in the upper end of one of the arms of an angle-lever, *g*. The angle-lever is pivoted at *g'* to the machine-frame, and its other arm is held by a spring (not shown) upon a cam, *i*, fixed on the axle of the lower roll, A.

For the purpose of directing the upper ply of the blank up over the lower end of the finger D, I make use of a narrow metallic strip or bar, *h*, which is attached to the former B and projects forward therefrom within and centrally of the paper blank through between the rolls A (which are grooved to permit its passage) and up to, or nearly to, the finger D. The forward end of the strip is upturned somewhat, so as to direct the upper ply to pass to and upon the finger D, which, in its forward position, stands at an inclination, as shown in Fig. 1. The upper ply rides up on the finger, while the lower ply is drawn along beneath the latter horizontally over the table to the pressing-rolls C. The finger remains stationary until a sufficient portion of the ply has passed up on it. It then, by the action of the cam *i*, angle-lever *g*, and arm *b*, is caused to swing backward upon the pivot *d* as a center until it occupies the position shown in dotted lines in Fig. 1, thus bringing it to a position in which the upper ply, which has been turned back with it, can readily pass off beneath it. By this time the front portion of the blank has been taken by the pressing-rolls C, which form the diamond fold upon the mouth end of the blank thus opened, and put in position for such action through the instrumentality of the retaining-finger. The diamond-folded blank passes from between the rolls C, and can then be acted on by any suitable instrumentalities for laying the parallel lines of paste on the diamond fold, and for making the second and final folds.

Rolls C can, if desired, be used as paste-rolls. I prefer, however, to use for this purpose a separate pair of power-driven rolls, D'. The upper roll is provided with paste ridges or ribs, which are supplied with paste in the usual way, and deliver the paste upon the diamond in two lines, one on each side of the longitudinal center of the diamond, as illustrated in my Letters Patent No. 239,457, and as shown also in Fig. 2 of the accompanying drawings. From the paste-rolls the blank, diamond fold foremost and uppermost, passes between a pair of power-driven rolls, E E', by which the second and final folds are made. The rolls, in all essential respects, save in the particulars hereinafter specified, in which my present improvement resides, are the same as the rolls described in my Letters Patent No. 243,858, of July 5, 1881. Roll E' is the blade-carrying roll, provided with two fixed blades, *j j'*, and roll E is the jaw-carrying roll, provided with two spring and cam controlled clamping-jaws, *k k'*, adapted, the former to coact with the blade *j* on the front flap of the diamond to make the second fold, the latter to coact with the blade *j'* upon the rear flap to make the final fold.

F F' are two wiper rolls or bars.

The general plan of operation is quite the same as that set forth in my Letters Patent No. 243,858, the blade *j* tucking the front flap down into the bite of clamping-jaw *k*, which retains its hold long enough to cause this flap to be wiped back and down by passing under the first wiper-roll, F, the fold thus completed being shunted off away from the folding-roll, out between the wiper-rolls F F', while the blade *j'*, in turn, as the folding-rolls continue to revolve, is caused to tuck the rear flap down into the bite of clamping-jaw *k'*, which by passing under the second wiper-roll, F', completes the final fold, and then releases the bag. In my said patented machine, however, not only the rear flap, but also the body of the bag beneath it, is tucked down into the bite of the clamping-jaw, so that the bag-body is creased and folded as well as the flap. By the improvement represented in the drawings I am enabled to avoid making this blind fold in the bag-body.

The preferred embodiment of my improvement in this direction is illustrated plainly in Figs. 4 and 5. The second blade, *j'*, is represented in its roll in Fig. 4. It projects farther from the roll at the ends 2 than it does in its intermediate portion, 3. This intermediate portion is of a length equal to or a little in excess of the width of that portion of the diamond-fold flap which it meets. The projecting ends or sides 2 are intended to bear or act on the bag-body on each side of the diamond-fold flap at the point where the blade makes the fold therein. The blade is, of course, notched, as usual, at 1 1, so as to keep it from contact with the paste-lines on the diamond fold; but this forms no part of the improvement. The mouth of the recess *l* in the roll E, in which the clamping-jaw is placed, is of the usual width for a distance equal to the length of the jaw; but beyond that distance at each end it is considerably enlarged, as shown at 4 4, Fig. 5. These enlarged portions are entered by the parts 2 2 of the blade, which parts are made blunt and rounding on the outer edge. By reason of this construction it will be seen that when the blade and jaw *j' k'* come together the side projections, 2 2, will push down the bag-body into the recess *l* before the part 3 of the blade begins to act on the diamond-fold flap, and by the time the latter has been pushed down into the bite of the jaw the loop or bend of the bag-body will have been carried by the parts 2 2 below and out of the reach of the acting end of the jaw, and will consequently remain uncreased and unfolded, as indicated in Fig. 3, in which the pushed-down bend of the bag-body is lettered *x'* and the folded part of the rear flap in the bite of the jaw is lettered *y'*. When the jaw *k'* releases its hold after the completion of the satchel-bottom the bag-body will show no sign of crease or blind fold.

This improvement is applicable generally to all folding-rolls employing clamping-jaws and blades whenever it is desired to crease and fold flat only one of two plies passing between the two rolls. I remark, also, that the projecting bag-body pushing portions 2 2 may be made separate from the flap-folding part of the blade, if desired, and may be acted on by cams and spring, so as to have an out-and-in movement at proper times, as described in my Letters Patent No. 243,858 with reference to the blades therein shown. I do not therefore restrict myself to the particular contrivance herein shown and described in illustration of my invention.

What I claim, and desire to secure by Letters Patent, is—

1. The combination, with the clamping-jaw roll, of the blade-roll provided with a blade adapted to tuck the ply to be folded into the bite of the clamping-jaw, and with side blades or flanges, which project beyond said tucking-blade and act to push the ply or plies which underlie the flap to be folded down into a recess or pocket in the jaw-roll, so that the loop or bend of the said pushed-down ply or plies will be carried beyond and out of the bite of the clamping-jaw, substantially as and for the purposes hereinbefore set forth.

2. The blade-roll provided with a blade formed with a central folding portion, 3, and projecting side portions, 2, in combination with the clamping-jaw roll provided with a clamping-jaw, *k'*, and a recess or pocket, *l*, with enlarged ends 4, substantially as and for the purposes hereinbefore set forth.

3. The finger D, suspended at its upper end from a vibratory carrier-frame, and means, substantially as described, for operating the same, in combination with the feed-rolls, the pressing-rolls, and the guide rod or strip for directing one ply of the blank upon the lower and free end of said finger, substantially as and for the purposes hereinbefore set forth.

In testimony whereof I have hereunto set my hand this 11th day of July, A. D. 1881.

WILLIAM C. CROSS.

Witnesses:
E. A. DICK,
N. C. LANE.