

(No Model.)

2 Sheets—Sheet 1.

W. LIDDELL.
PAPER BAG MACHINE.

No. 564,288.

Patented July 21, 1896.

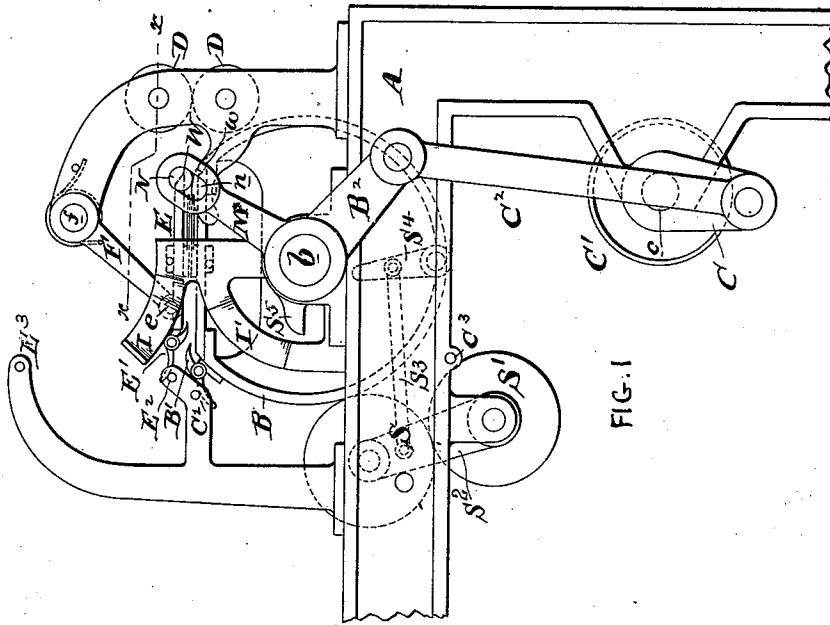


FIG. 1

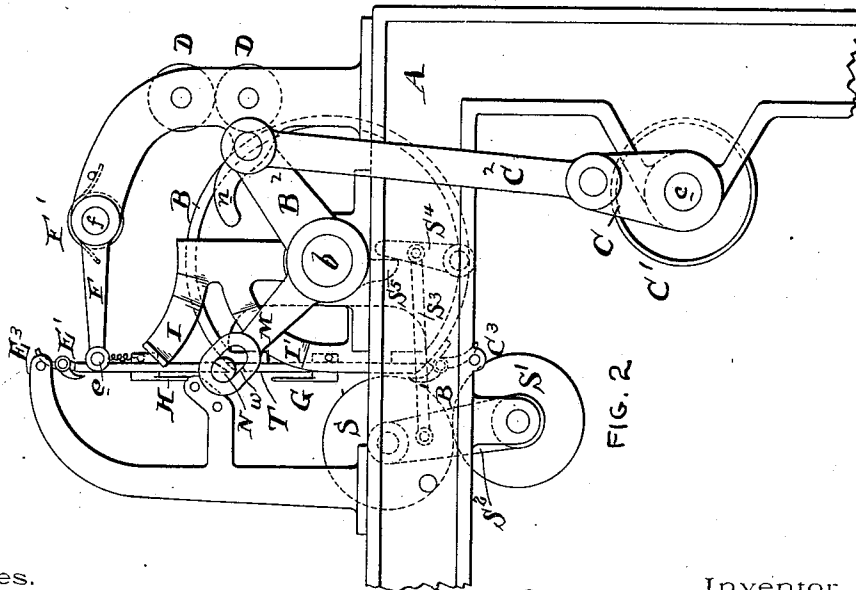


FIG. 2

Witnesses.

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William Liddell

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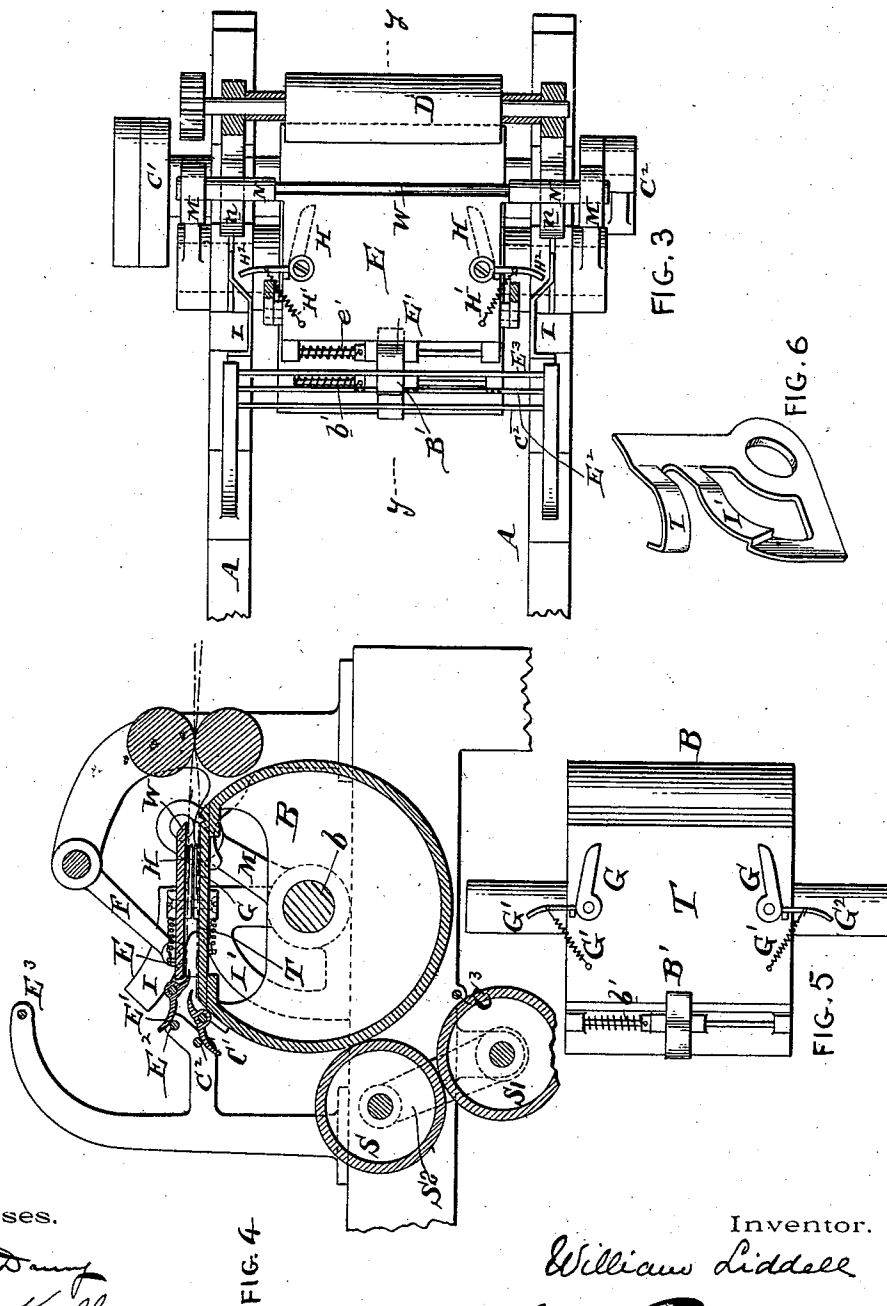
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2 Sheets—Sheet 2.

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PAPER BAG MACHINE.

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Witnesses.

Henry Dunning
R. M. Kelly

Inventor.

William Liddell

By *Wm. L. Liddell*

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UNITED STATES PATENT OFFICE.

WILLIAM LIDDELL, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE EASTERN PAPER BAG COMPANY, OF CONNECTICUT.

PAPER-BAG MACHINE.

SPECIFICATION forming part of Letters Patent No. 564,288, dated July 21, 1896.

Application filed January 21, 1896. Serial No. 576,269. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM LIDDELL, of the city of Brooklyn, county of Kings, and State of New York, have invented an Improvement in Paper-Bag Machines, of which the following is a specification.

My invention has reference to paper-bag machines; and it consists of certain improvements which are fully set forth in the following specification and shown in the accompanying drawings, which form part thereof.

This application comprehends certain improvements in the class of machines adapted to the manufacture of bellows-side-fold paper bags having satchel-bottoms. In another pending application (Case A) I have described certain improvements comprehending a rotating cylinder combined with an oscillating forming-plate and with the necessary folding-fingers and nippers for producing in a continuous manner satchel-bottoms to bellows-side-fold tubes.

My present improvements comprehend certain modifications of an apparatus of that character. In this case I employ a rotary reciprocating cylinder having a flat bed combined with a rotary reciprocating forming-plate, and nippers and folding-fingers upon both of said parts, whereby with each reciprocation a paper tube shall be received and folded with the necessary folds to form a satchel-bottom upon the tube and then be delivered for subsequent pasting operation, which latter, however, forms no part of my invention.

My invention will be better understood by reference to the accompanying drawings, in which—

Figure 1 is a side elevation of my improved paper-bag machine in position adapted to receive the paper tube. Fig. 2 is a similar view showing the machine when the end of the tube has been opened and the necessary folds formed therein. Fig. 3 is a plan view of Fig. 1 with the portion above the dotted lines *xx* removed. Fig. 4 is a sectional elevation on line *yy* of Fig. 3. Fig. 5 is a plan view of the rotary reciprocating cylinder, and Fig. 6 is a perspective view of the cam-frame. A is the main frame of the machine.

b is a rocking shaft, upon which is firmly secured the rotary reciprocating cylinder B, which is provided with the flat-bed T. The shaft *b* is provided on the end with an arm B², which connects by a link or connecting-rod C² with a crank C, which latter is driven by the shaft *c* and power-wheel C'. By the rotation of the shaft *c* the shaft *b* is caused to rock in its bearings in the main frame A, and thereby produces a rotary reciprocating motion to the bed T of the cylinder B.

Arranged above the cylinder B and corresponding to the bed T thereof is a former-plate E, hinged at the rear end at *e* to the arms F, carried upon a shaft *f*, which is journaled in the main frame A. The forward end of the said plate E has a creasing edge W, which, in the operation of forming the bottom, enters a small groove *w* in the bed-plate T to impart a positive transverse crease to the paper tube. The rear end is provided with journals N, which work in slotted bearings in the arm M.

When the parts are in the position shown in Fig. 1, the journals N rest upon cam surfaces *n*, and thus hold the rear end W clear of the bed T, so as to form a space between the parts T and E to permit the tube to pass as it is delivered thereto by the feeding-rolls D D. The rear end of the former-plate E is provided with a spring-actuated nipper E', which, when in the position shown in Fig. 1, is held open by the pin or rod E². The rear end of the bed T is also provided with a similar spring-actuated nipper B', which, when in the position shown in Fig. 1, is held open by the pin or rod *c*². When the tube is run in between the parts E and T, the nippers E' B' are brought into position to nip the part and also the sides of the tube, respectively, and upon the parts being moved the nippers are liberated and close upon the paper, after which time they retain possession of the said ends of the tube and cause them to be opened as the position indicated in Fig. 2 is approached.

Upon each side of the bed T is arranged a pivoted folding-finger G, having an arm G² to operate it, and combined with a spring G' to hold it normally out of action. The fingers

are forced inward against the action of the spring G' by the cam surfaces I' during the rotary reciprocation of the cylinder B. The plate E is also provided with similar folding-fingers H H, which are also actuated by means of arms H² and held out of operating position by springs H'. In the formation of the bottom of the tube the cams I operate upon the arms H² and throw the fingers inwardly, insuring them securing such position as to produce the proper folding of the paper.

As the apparatus changes from the position of the parts shown in Fig. 1 to the position shown in Fig. 2, the nippers retain custody of the ends of the paper tube. The folding-fingers G H are thrust into the bellows side folds at the proper angle, and as the parts reach the position shown in Fig. 2 the bottom of the tube will have one of its layers folded backward, so that as the folded tube passes through the delivery-rolls S the diamond folds will have been formed and ready to receive the pasting and final folding operation, which may be performed in any of the usual manners. Just prior to the parts reaching the position shown in Fig. 2 the fingers H and G are liberated from the control of the cams I and I', and this permits the springs H' and G' to throw the said fingers out of the way of the tube, so that the latter may be readily withdrawn. Furthermore, it will be observed that the spring-nippers are brought into contact with pins or rods E³ C³, insuring their being opened at the proper instant and after they have performed their functions.

To insure the proper transverse creasing of the tube, I have before described that the rear edge W of the former-plate E creases the paper in the transverse groove w of the bed-plate T, and this action remains during the folding operation, but the paper tube is released at the completion of the operation by the action of the spring F' lifting the plate E and its arm F vertically and sustaining it in the position shown just at the completion of the reciprocation of the cylinder B. In this manner the transverse crease is positively formed and at the proper instant the tube is liberated for delivery. As soon as these actions have taken place and the tube is delivered by the rotary delivery-roll S, which has pins s, and is moved by a frame S², link S³, arm S⁴, and lug S⁵ on the shaft b. The lug b acts through said parts to draw the roller S forward when the bed T is fully lowered, so that the pins catch the tube and carry it off between rolls S and S to the pasting and folding devices. (Not shown.) When this is accomplished, the parts are returned to their original position. (Shown in Fig. 1.)

Any other form of feed and delivery for the tube may be employed in lieu of that shown.

I do not confine myself to the details of construction, as they may be modified in various ways without departing from the principles of my invention.

Having now described my invention, what

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

1. In a paper-bag machine, the combination of a rotary reciprocating bed, an oscillating reciprocating former-plate adapted to move simultaneously with the bed and operated therewith like a hinge, a stationary axis to which the former-plate is linked power devices to simultaneously operate the said bed and also the said plate, and means upon both the bed and plate to hold and crease the bag-tube during their movements.

2. In a paper-bag machine, the combination of a rotary reciprocating bed, an oscillating reciprocating former-plate adapted to move simultaneously with the bed and operate therewith like a hinge, a pivoted link for sustaining the weight of the forward end of the former-plate power devices to simultaneously operate the said bed and also the rear end of said plate, and means upon both the bed and plate to hold the ends of the tube-layers so as to open the end of the tube, and folding-fingers to crease the bag-tube on diagonal lines during their movements.

3. In a paper-bag machine, the combination of a rotary reciprocating bed, an oscillating reciprocating former-plate adapted to move simultaneously with the bed and operate therewith like a hinge, power devices to simultaneously operate both the said bed and former-plate, a cam device for holding the rear edge of the former-plate from the bed when receiving the bag-tube, and clamps upon the forward edges of the bed and former-plate to hold the two layers of the tube and separate them during the operation of the said bed and former-plate.

4. In a paper-bag machine, the combination of a rotary reciprocating bed, an oscillating reciprocating former-plate adapted to move simultaneously with the bed and operate therewith like a hinge, power devices to simultaneously operate both the said bed and former-plate, a cam device for holding the rear edge of the former-plate from the bed when receiving the bag-tube, folding or creasing fingers upon the former-plate and bed to enter the bellows side folds of the tube to make the oblique creases or folds, and clamps upon the forward edges of the bed and former-plate to hold the two layers of the tube and separate them during the operation of the said bed and former-plate.

5. In a paper-bag machine, the combination of a rotary reciprocating bed, an oscillating reciprocating former-plate adapted to move simultaneously with the bed and operate therewith like a hinge, power devices to simultaneously operate both the said bed and former-plate, a cam device for holding the rear edge of the former-plate from the bed when receiving the bag-tube, clamps upon the forward edges of the bed and former-plate to hold the two layers of the tube and separate them during the operation of the said bed and former-plate, and means for opening

said clamps when the bed and former-plate reach the end of their extreme movements.

6. In a paper-bag machine, the combination of a rotary reciprocating bed, an oscillating reciprocating former-plate adapted to move simultaneously with the bed and operate therewith like a hinge, power devices for reciprocating the bed and former-plate simultaneously, feeding devices for feeding the bag-tubes between the bed and former-plate when at rest, cam devices for holding the bed and former-plate separated to permit the entrance of the tube, and means on the bed and former-plate to open the end of the bag-tube and properly crease it to assist in forming a satchel-bottom bag.

7. In a paper-bag machine, the combination of a rotary reciprocating bed, an oscillating reciprocating former-plate adapted to move simultaneously with the bed and operate therewith like a hinge, a stationary axis to which the former-plate is linked, power devices to simultaneously operate the said bed and also the said plate, means upon both the bed and plate to hold and crease the bag-tube during their movements, and a cam device for temporarily holding the rear edge of the

former-plate from the bed when receiving the tube and at the time when the opening operation of the tube is not taking place.

8. In a paper-bag machine, the combination of a rotary reciprocating bed, an oscillating reciprocating former-plate adapted to move simultaneously with the bed and operate therewith like a hinge, a pivoted link for sustaining the weight of the forward end of the former-plate, power devices to simultaneously operate the said bed and also the rear end of said plate, means upon both the bed and plate to hold the ends of the tube-layers so as to open the end of the tube, folding-fingers to crease the bag-tube on diagonal lines during their movements, and a cam device for temporarily holding the rear edge of the former-plate from the bed when receiving the tube and at the time when the opening operation of the tube is not taking place.

In testimony of which invention I hereunto set my hand.

WM. LIDDELL.

Witnesses:

R. M. HUNTER,
ERNEST HOWARD HUNTER.