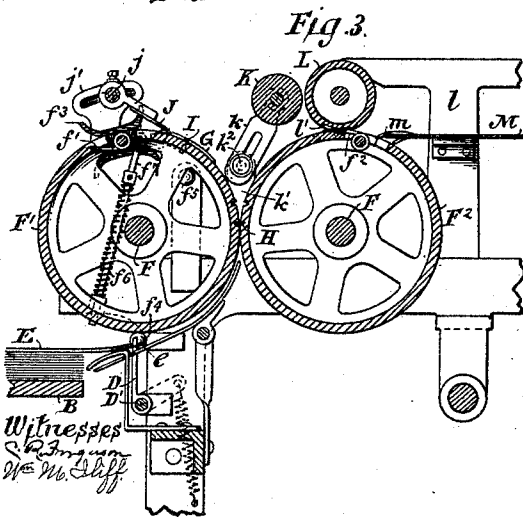
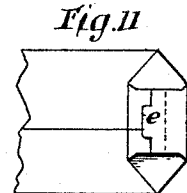
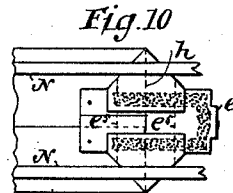
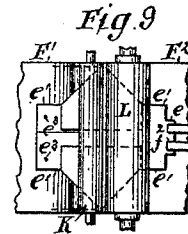
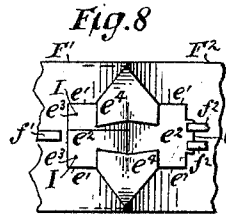
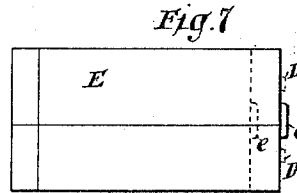
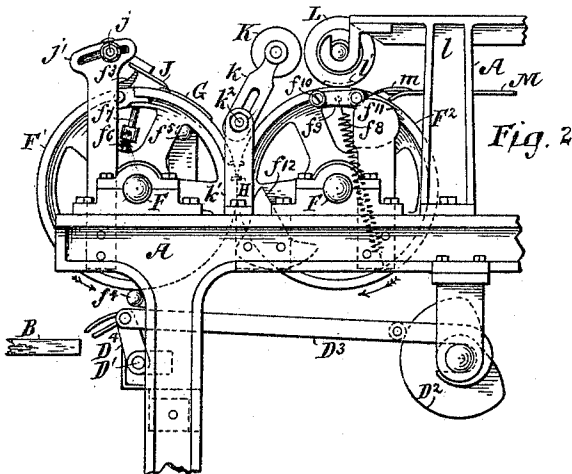
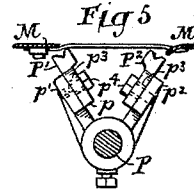
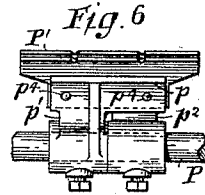
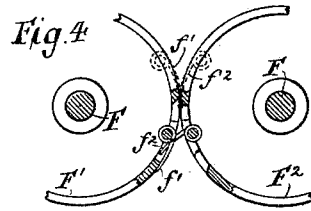
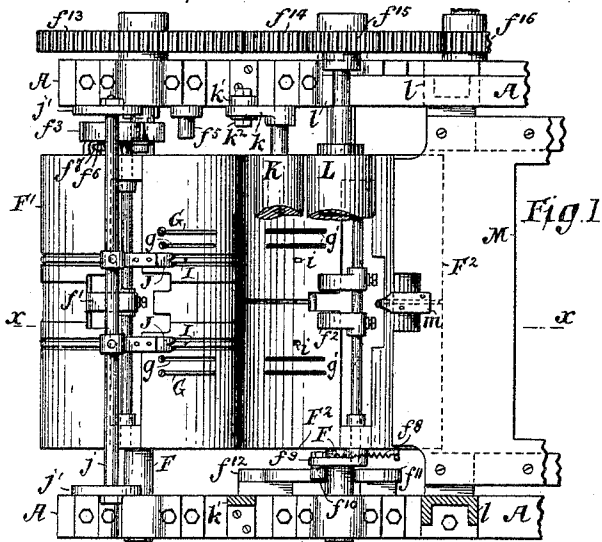


W. LIDDELL.
PAPER BAG MACHINE.

Patented Feb. 14, 1893.



Inventor
William Liddell
By his attorney
Edwin H. Brown

UNITED STATES PATENT OFFICE.

WILLIAM LIDDELL, OF BROOKLYN, NEW YORK, ASSIGNOR TO WELLS A. BINGHAM, OF BLOOMFIELD, NEW JERSEY.

PAPER-BAG MACHINE.

SPECIFICATION forming part of Letters Patent No. 491,573, dated February 14, 1893.

Application filed February 11, 1892. Serial No. 421,133. (No model.)

To all whom it may concern:

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

This machine is applicable to a machine of the kind set forth in United States Patent No. 455,407 which, on the 7th day of July, 1891, was issued for an improvement invented by me.

I will describe a portion of a paper bag machine embodying my improvement and then point out the novel features in the claims.

In the accompanying drawings, Figure 1 is a top view of a portion of a machine embodying my improvement, certain parts being broken away and shown in section. Fig. 2 is a side elevation of a portion of the machine illustrated in Fig. 1. Fig. 3 is a vertical longitudinal section taken at the plane of the dotted line *xx* Fig. 1. Fig. 4 is a sectional side view of two cylinders comprised in the portion of the machine illustrated by Figs. 1, 2 and 3, and illustrating the grippers of said cylinders in certain positions. Fig. 5 is a view taken longitudinally of the machine illustrating certain creasing devices. Fig. 6 is a view of these creasing devices in a plane at right angles to that of Fig. 5, or, in other words, in a plane transverse to the length of the machine. Fig. 7 is a top view of a pile of bag blanks or tubes whose bottoms are to be formed in the machine and certain guides are also illustrated in this figure. Figs. 8, 9 and 10 are plan views of different parts of the machine and of bags, the latter being illustrated at different stages of the formation of their bottoms. Fig. 11 is a top view of a completed bag as it leaves the machine.

Similar letters of reference designate corresponding parts in all the figures.

A designates the framework of the machine. In the present instance, it is shown as consisting of side pieces and transverse stretchers but it may be of any other approved construction.

B designates a platform or table upon which the bag blanks or tubes are supported before being fed to the machine. This may be of any suitable construction.

E designates the bag blanks or tubes. They may be made of paper or other material in tubular form folded down flat and left open at the two ends. In Fig. 7, which is a plan view of a pile of bag blanks, the uppermost blank is represented as slightly advanced relatively to those below it. At the forward end, each bag blank or tube is provided with a lip *e*. The bag blanks or tubes are so arranged in the pile that the side of each bag blank having the lip *e* will be undermost.

D designates the front gages against which the forward ends of the bag blanks or tubes bear when properly placed upon the platform. They extend from a rock shaft *D'*, which may be oscillated by a cam *D²*, through the agency of a cam rod *D³* connected with an arm *D⁴* extending from said rock shaft.

F¹ F² designate gripping cylinders moving in the directions indicated by the arrows marked adjacent to them, in Fig. 2. Shafts F carry these cylinders and are journaled in bearings mounted upon the side pieces of the framework A. These cylinders are provided with grippers *f' f²* consisting of fingers mounted upon oscillating rods journaled to lie within recesses formed in the peripheries of the cylinders. The gripper *f'* has a single finger opposite the center of the length of the cylinder F¹. Two fingers are used in the gripper *f²* and they are arranged one on each side of the finger of the gripper *f'*, which will be readily understood by reference to Fig. 8. Each gripper swings nearly throughout a half circle, so that at one end of its motion it will point in the reverse direction to that in which it pointed when at the other end of its motion.

The gripper *f'* of the cylinder F¹ grips the lip *e* of the uppermost bag blank or tube when the latter is fed into the machine and carries it forward. The position of the gripper *f'* while still holding a bag blank or tube is illustrated in Fig. 4. As the lip is on the under side of the bag blank, both sides of the bag blank will be held snugly against the cylinder F¹ while the lip *e* is held by the grippers *f'*.

The gripper *f²* of the cylinder F² will be rocked over into the recess in the cylinder F¹ in which the rod of the gripper *f'* lies, so that the ends of the fingers of said gripper *f²* will extend between the lip *e* of the bag blank or

tube and the cylinder F' . This may be readily understood by reference to Fig. 4. After the fingers of the gripper f^2 of the cylinder F^2 have engaged the lip e of the bag blank or tube in the manner described, the gripper f' of the cylinder F' will release said lip and the gripper f^2 of the cylinder F^2 will close upon the lip and hold it.

Any suitable means may be employed for operating the grippers. I have shown the gripper f' as provided with a tumbler f^3 which is affixed to the rod whereby the gripper is connected to the cylinder F' . This tumbler has two projections which engage with pins or stationary cams f^4 f^5 extending from the framework of the machine. By co-acting with these pins or stationary cams, the tumbler is properly rocked to effect the desired action of the gripper. Normally this gripper will be so actuated by means of a spring f^6 that its finger will be pressed toward the cylinder F' . The spring f^6 is coiled around a rod f^7 which at one end is pivotally connected with the tumbler and at the other end works within a bearing provided in the cylinder F' . The spring is coiled around the rod between this bearing and a collar which is fastened upon the upper part of the rod.

The gripper f^2 of the cylinder F^2 is normally pressed toward this cylinder by means of a spring f^8 . The rod by which this gripper is fastened to this cylinder has affixed to one end an arm f^9 carrying at its outer end an anti-friction roller f^{10} . Cams f^{11} f^{12} supported by the framework of the machine co-operate with the anti-friction roller f^{10} so as to oscillate the arm f^9 in the proper manner to swing the gripper away from the cylinder at the desired times for enabling the gripper to engage with the lip and afterward to release the lip.

The cylinder F' is provided with slitting knives G for slitting the bag blanks, so as to form the edges e' of the flaps e^2 . In order to adapt the machine for different sized bags, these slitting knives may be adjusted into different positions upon the cylinder F' . As here shown, they are secured in recesses extending circumferentially of the cylinder, and it will be seen that adjacent to the knives are other recesses g in which the knives might be inserted.

The cylinder F^2 is provided with recesses g' at points which will be opposite the grooves in the cylinder F' for receiving the slitting knives. There will be different sets of these grooves for receiving the edges of the slitting knives when the latter are operating upon different sized bag blanks. It is advantageous to have these recesses g' extend entirely through the shell of the cylinder so that they will not become filled up.

On the cylinder F' is a creasing bar H extending parallel with the axis. It is inserted in a groove in the cylinder, and, in order that the machine may be adapted for producing bags of different sizes, a number of grooves

suitable for receiving the creasing bar will preferably be formed in the cylinder, as shown in Fig. 3. Opposite each of the grooves for the creasing bar with which the cylinder F' is provided, the cylinder F^2 is provided with a corresponding groove into which the creasing bar may work. The function of this creasing bar is to form a crease in a bag blank or tube along the dotted line h Fig. 10, to cause the folding of the bag bottom over the body of the bag to be more accurately performed than otherwise would be possible.

I designates needles extending from the cylinder F' . Opposite them, the cylinder F^2 is provided with recesses i . These needles engage the upper side of the bag blank or tube. In Fig. 8, holes e^3 , where the pins have passed through the bag blank, are represented, and from this it will be seen that the needles engage that portion of the upper side of a bag blank which ultimately becomes the side flap on that side of the bag blank. These needles hold the upper side of a bag blank or tube after the gripper f' of the cylinder F' has released the flap, e , of such bag blank or tube and their function is to co-operate with the gripper f^2 of the cylinder F^2 in pulling the sides of the bag blank or tube apart at the forward end, for the purpose of causing the side flaps e^4 of the bag blank to be turned inward.

Above the cylinder F' are stripping fingers J . These are mounted upon a rod j which is bolted to standards j' extending from the framework of the machine. The standards j' are slotted concentrically with the axis of the cylinder F' , and the rod j passes through these slots. Nuts applied to screwthreads formed upon the ends of the rod serve to clamp the rod to the standards after the rod shall have been adjusted to any desired position. The stripping fingers are shown as having forked ends and beneath them the cylinder F' is provided with circumferential grooves to enable the fingers to descend lower than otherwise would be possible. The function of the stripping fingers is to disengage the bag blank or tube from the needles I .

K is a roller supported in arms k at a suitable distance above the cylinder F^2 to prevent the side flaps e^4 , after being turned in, from bending outward again before they are pressed down flat. The arms k are supported by standards k' erected upon the side pieces of the framework of the machine. Longitudinal slots are formed in the arms and through these slots pass bolts k^2 . As these bolts are longitudinal where they pass through the slots of the arm k , provision is afforded not only for adjusting the arms longitudinally, but also for oscillating them. Owing to this, the roller K may be adjusted into any position that it is desired to occupy. This roller is journaled loosely in its supporting arms and only rotates by contact with a bag blank or tube. Preferably it will be made of wood or other like material.

L designates a pressing roller mounted in standards *l* erected upon the side pieces of the framework A. This roller is shown as arranged with its axis above the axis of the cylinder F². It is made of iron or other suitably heavy material, as it is designed to press the bag blanks or tubes between it and the surface of the cylinder F². Its journals extend into bearings of such construction as to enable the roller to rise and fall. As here shown, the bearings are open at the top, and hence permit of the ready removal of the roller. In this roller are peripheral recesses *l'* for accommodating the fingers of the gripper *f*² belonging to the cylinder F². This roller L is intended to make three rotations to one rotation of the cylinder F².

The cylinders F¹ F² are caused to rotate in unison by means of intermittent gear wheels *f*¹³ *f*¹⁴, mounted upon journals of the shafts F carrying these cylinders. With the gear wheel *f*¹⁴ engages a gear wheel *f*¹⁵ mounted upon one of the journals of the roller L. The gear wheel *f*¹⁴ derives motion from a gear wheel *f*¹⁶ on the driving shaft of the machine. The roller L presses down the side flaps *e*⁴ of the bag blanks or tubes flat.

M designates a table upon which the bag blanks or tubes are delivered from the cylinder F². At the forward end, this table is provided with a lip *m* which will slip under the lip *e* of each bag blank or tube and thus prevent the latter from continuing its motion around the cylinder.

The bag blanks or tubes pass over the table M until they reach the pasting devices. I have not represented the latter, as they need not differ from what I have illustrated in Patent No. 455,407. After the pasting of the bag blanks or tubes, they are carried along by belts, N, to devices whereby they are creased upon the lines *e*⁵. The creasing devices consist of creasing bars corresponding to those set forth in Patent No. 455,407, and grooved supporting bars P¹ P², which are illustrated by Figs. 5 and 6. These bars are supported by arms *p*¹ *p*² which are provided with hubs or collars that are mounted upon a shaft P supported by the side pieces of the framework A. Each arm *p*¹ *p*² has an offset portion *p*, and the offset portion of each arm extends reversely to that of the other arm. The hubs or collars of the arms are fastened by set screws to the shaft P. Obviously, each arm may be adjusted circumferentially on the shaft to vary the distance of the bars P¹ P² from each other. The bars P¹ P² are provided with slots *p*³ which extend in the direction of the length of the arms, or, in other words, radially to the shaft P. Screws *p*⁴ pass loosely through these slots and engage with tapped holes in the arms. This manner of connecting the bars to the arms affords provision for adjusting the bars nearer to or farther from the axis on the shaft P.

In this machine, the bag blanks will be fed

along with the seamed side adjacent to the first cylinder and in the present instance with the seamed side uppermost as it is fed from the table. This is advantageous because when the bag is completed, its bottom will be folded down flat above the seamed side, as illustrated in Fig. 11, leaving the unseamed side of the bag wholly exposed, so that printing may be done over its entire surface. Moreover, this is advantageous because when the bag bottom is finished, the side flap having the lip *e* will be outermost and will protect the other side and give the bag bottom a better appearance. This lip by projecting over the side flap of the seamed side of the bag protects the same.

What I claim as my invention and desire to secure by Letters Patent, is:

1. In a machine for making paper bags from blanks severally having a lip on one side extending in the direction of the length of the bag blank beyond the other side, the combination of a cylinder provided with means for engaging the lip of one of said bag blanks while the side from which said lip extends is farther from the cylinder than the other side of the bag blank and also having means for engaging that side of the bag blank which is not provided with a lip and which latter side of the bag blank is contiguous to said cylinder, a second cylinder and a gripper on said second cylinder for engaging with that side of the bag blank lip which is the nearer to the first mentioned cylinder and pulling it away from the first mentioned cylinder and securing it to the second mentioned cylinder, substantially as specified.

2. In a paper bag machine, the combination of two cylinders, one of which has pins for engaging one side of a bag blank and a gripper for engaging the other side of a bag blank and the second of which cylinders is provided with a gripper constructed and adapted to engage with that side of the bag blank which is held by the gripper of the first cylinder and disengage it therefrom and secure it to the second cylinder, substantially as specified.

3. In a paper bag machine, the combination of a cylinder provided with needles and grippers for engaging opposite sides of a bag blank, a second cylinder having a gripper for taking the side of the bag blank which was engaged by the gripper of the first cylinder and transferring it to the second cylinder and a stripper co-acting with the first cylinder for engaging that side of the bag blank which is fastened thereto by the said needles, substantially as specified.

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

WM. LIDDELL.

Witnesses:

ANTHONY GREF,
WM. M. ILIFF.