

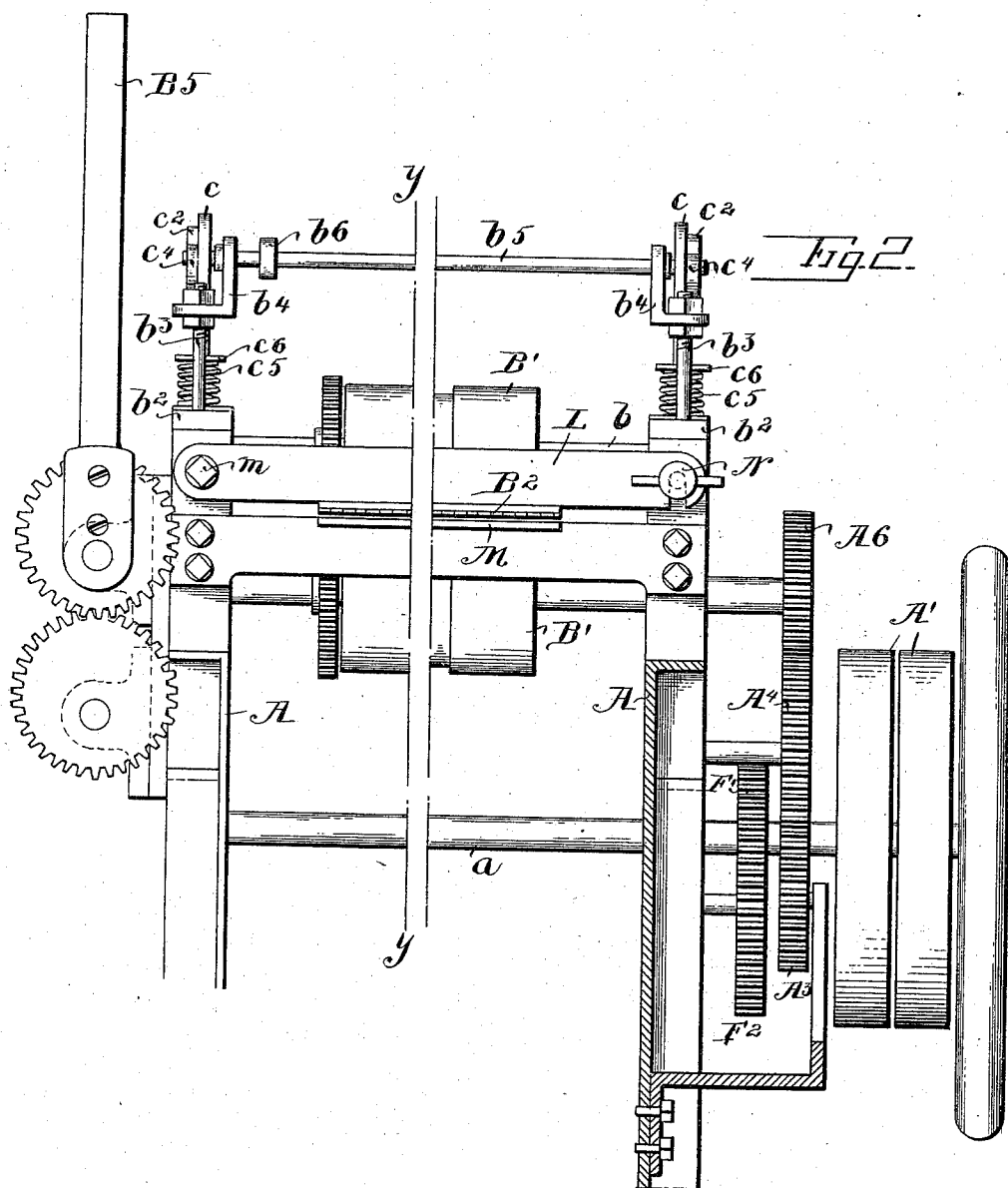
(No Model.)

3 Sheets—Sheet 2.

W. LIDDELL.
PAPER BAG MACHINE.

No. 535,591.

Patented Mar. 12, 1895.



Witnesses

Jesse B. Heller.
Mrs. Maud Hunter

Inventor.

Wm. Liddell
By Attorney
Attorney.

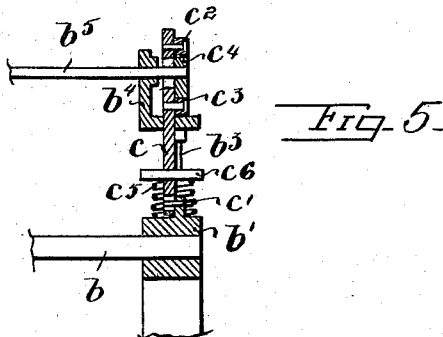
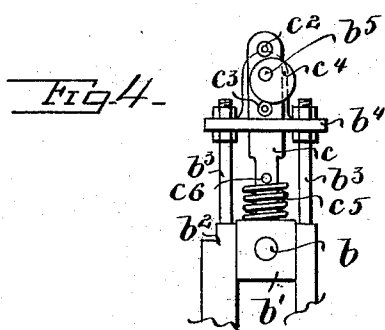
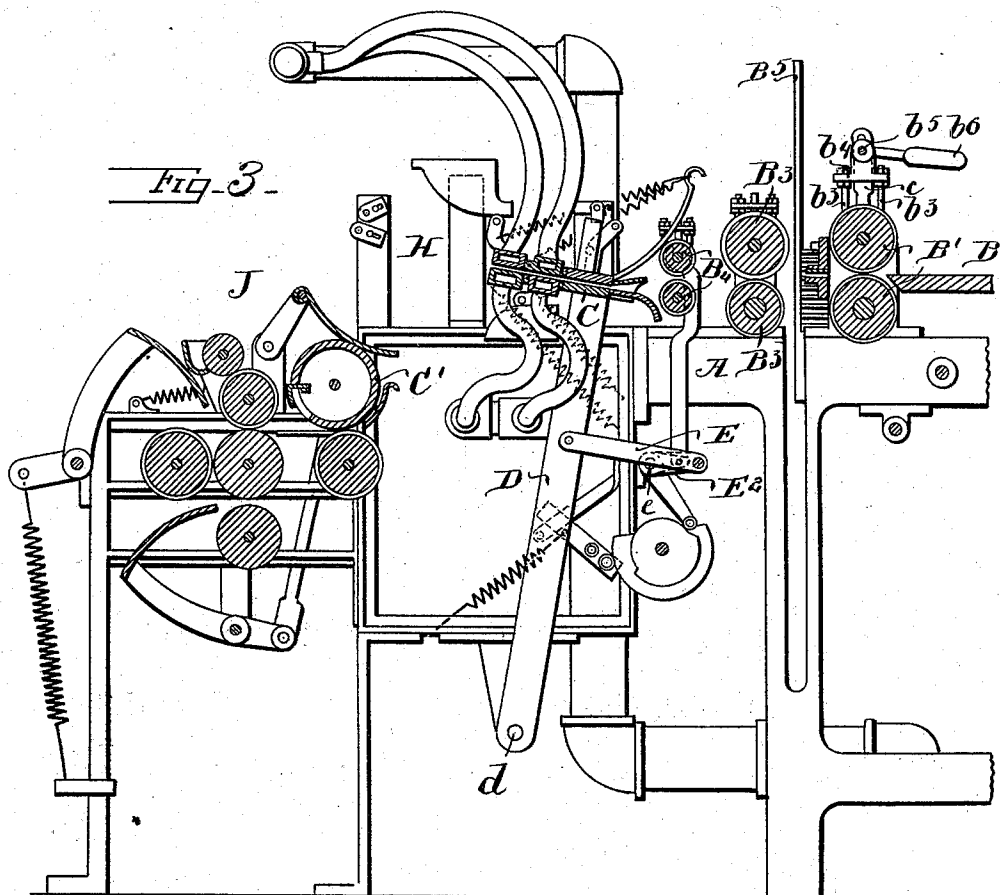
(No Model.)

3 Sheets—Sheet 3.

W. LIDDELL.
PAPER BAG MACHINE.

No. 535,591.

Patented Mar. 12, 1895.



Witnesses:

Jesse B. Heller,
Wm. M. M. M. M.

Inventor.

Wm. Liddell

By *[Signature]*
Attorney.

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. 535,591, dated March 12, 1895.

Application filed February 9, 1894. Serial No. 499,585. (No model.)

To all whom it may concern:

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

My invention relates to paper bag machines and consists of certain improvements which are fully set forth in the following specification and are shown in the accompanying drawings.

More particularly my invention relates to improvements in the feed and pressure rollers which feed the tube sections to the forming devices or other portions of a paper bag machine and these improvements are designed to enable the rollers to be easily separated and to apply to them a yielding or spring pressure.

I shall now refer to the accompanying drawings for the purpose of more fully describing my improvements.

Figure 1 is a side elevation of a paper bag machine having my improvements applied. Fig. 2 is a transverse vertical sectional view of the same on the line $x-x$ of Fig. 1 on an enlarged scale. Fig. 3 is a longitudinal vertical sectional view of part of the machine on the line $y-y$ of Fig. 2. Fig. 4 is an enlarged side elevation of the mechanism for raising and lowering the feed and pressure rollers of the tube forming apparatus. Fig. 5 is a vertical sectional view of the same on the line $z-z$ of Fig. 4.

For the purpose of illustration I have shown my improvements applied to a paper bag machine adapted for making a satchel square bottom upon a bellows side fold tube, in which the cut tube sections are fed from the tube former to suction bottom forming devices and pass thence to the final folding and pasting devices.

The bottom forming devices consist of reciprocating sectional suction formers between which the end of the tube section is clamped, and these sectional suction formers are caused to move apart or open up and thereby to impart the proper folds or creases to the paper, which adheres to their moving suction faces.

When the paper has been properly folded, the bottom forming devices are unclamped to release the paper tube and permit it to be stripped off and to pass to the final folding and pasting devices.

A machine of this character is shown in the Letters Patent to William B. Purvis, Nos. 519,348 and 519,349, dated May 8, 1894, and No. 530,650, dated December 11, 1894.

For the purpose of rendering my improvements more easily understood, I shall first briefly describe the general construction of a machine of this character, for a more full description of which reference may be made to the aforesaid Letters Patent.

A is the main frame of the machine.

B is the usual tube forming apparatus for forming the paper into a bellows side fold tube.

B' B' are the usual flattening feed rolls of the tube forming apparatus, by which the paper tube is fed to the cutters B², B⁵, where it is cut into the proper sections.

The cutter B² is the dead knife or stationary cutter, and the cutter B⁵ is the revolving or striking arm or bar. The cut tube sections are taken from the cutters B² B⁵ and are fed by means of suitable stripping and feeding rollers B³, B³, B⁴, B⁴, to the bottom forming mechanism H. This bottom forming mechanism consists of two reciprocating perforated suction formers between which the end of the paper tube is fed and clamped. These formers are caused to move apart or open out and thereby break the paper, which adheres to their perforated suction faces, into the proper folds or creases.

The bottom forming devices are operated by any suitable driving mechanism. This is shown in the drawings as consisting of a rocking lever D, fulcrumed at d and connected at its upper end with the frame or carrier C of one of the reciprocating suction formers. This lever D is rocked through a link E by a crank E² on a shaft e .

From the bottom forming devices H, the paper tube is stripped by suitable stripping devices, such as the gripping roller C', and passes thence to the final folding and pasting

devices J, by which the pasting and folding operations are performed and the bag is finished.

The machine thus consists of tube forming and cutting devices, bottom forming devices, 5 and stripping and final folding and pasting devices. The various movements are imparted to these different portions of the machine from a main driving shaft *a* operated 10 by a driving pulley A'. From a pinion F' on the shaft *a* motion is transmitted through intermediate gears F² to a driving gear F³ on a counter shaft *f'*, and from the driving gear F³ to the gear F⁴ on the crank shaft *e*, by which 15 the lever D and the bottom forming devices are operated. From the gear F³ power is transmitted through a train of intermediate gears G', G', G⁵, to the driving gear G², from which the stripping and final folding and 20 pasting devices are operated. From a gear A² on the shaft *a* motion is transmitted through a suitable train of gears A³, A⁴, to the driving gears A⁵, A⁶, of the flattening feed rollers B', B', of the tube forming devices and of the 25 stripping rolls B³, B³, which take the cut tube sections from the cutters. The revolving cutter bar B⁵ is also operated from the gear A² through suitable connections (not shown).

The time of operation of the bottom forming and folding mechanism may be timed 30 with reference to the tube forming and feeding devices and to the stripping and final folding and pasting devices by the employment of suitable adjustable gearing.

The bar L which carries the cutter B² may 35 be hinged or pivoted at one end as at *m* and secured at its other end by a clamp N, so that the bar L and its cutter B² may be lifted to allow access to the feed rollers B', B', for 40 cleaning purposes.

It is usual to journal the upper flattening feed roller B' in spring pressed boxes, so that it will bear with a spring pressure upon the 45 paper as it passes between it and the lower roller.

My invention relates to improvements in the manner of supporting the upper roller so that it may be easily raised when desired, and may 50 be brought in contact with the lower roller by spring pressure.

The shaft *b* of the upper roller B' is journaled in sliding boxes *b'* guided in suitable guides *b²* on the sides of the machine.

b³ b³ are two uprights carried by the guide 55 frames *b²* at each end and support a cross piece *b⁴*.

Each box *b'* is loosely connected, as by a pin and slot connection *c'*, with a piece *c* which projects up through the cross piece *b⁴* and is 60 provided at its upper end with two pins or projections *c²*, *c²*, located one above the other. Pivoted in extensions of each cross piece *b⁴* is a cam *c⁴* located between the pins *c²*, *c²*, and adapted when turned to bear upon either the

upper or lower pin, thereby elevating or de- 65 pressing the piece *c*. For the purpose of turning the two cams together and thus equalizing the spring pressure at each end of the roller B', I have shown the cams carried on a rock shaft *b⁵* journaled in the arms of the pieces 70 *b⁴*, and provided with a handle *b⁶* by which it may be operated. I have also shown the shaft extending through the pieces *c* with the cams *c⁴* on the outside, the pieces *c* being slotted to permit the movements described. These are 75 of course unimportant details and may be varied.

Interposed between each box *b'* and its piece *c* is a spring *c⁵*, bearing at one end upon the surface of the box and at the other on 80 a pin or lug *c⁶* on the piece *c*.

The operation of these devices is as follows: When the cams *c⁴* are turned up so as to bear against the upper pins *c²* the pieces *c*, and with them the sliding boxes *b'*, will be lifted, 85 thus raising the upper roller B' from contact with the lower roller B'. When the cams *c⁴* are turned down, as shown in Fig. 5, the pieces *c* are moved down so as to compress the interposed springs *c⁵* and thereby put the 90 boxes *b'* under spring pressure, so that the upper roller B' will bear against the lower roller with more or less spring pressure. As the two cams are operated together through the shaft *b⁵* this pressure will be the same at 95 each end.

While I have shown these devices for raising and depressing the feed roller applied to the roller B', it is apparent that it may be applied also to the other rollers, as B³ and B⁴. 100

It will be understood that the minor details of construction shown and described may be varied without departing from the invention.

What I claim as new, and desire to secure by Letters Patent, is— 105

1. In a paper bag machine the combination with the pressure feed rolls of sliding boxes in which one of the rolls is journaled, uprights loosely connected with said boxes, springs interposed between the uprights and 110 boxes, and means to raise or lower the uprights whereby the sliding boxes may be raised or depressed.

2. The combination with the rollers B' B', of the sliding boxes *b'* in which one of said 115 rollers is journaled, the upright pieces *c* loosely connected with the boxes *b'*, the springs *c⁵* between the pieces *c* and the boxes *b'*, and a cam to raise or lower the pieces *c*.

3. The combination with the rollers B' B', 120 of the sliding boxes *b'* in which one of said rollers is journaled, the upright pieces *c* loosely connected with the boxes *b'*, and provided with projections *c²*, *c²*, the springs *c⁵* between the pieces *c* and the boxes *b'*, stationary 125 frames *b⁴*, above the boxes and pivoted cams *c⁴* carried by the frames *b⁴* and located between the projections *c²*, *c²*.

4. The combination with the rollers B' B',
of the sliding boxes b' in which one of said
rollers is journaled, the upright pieces c con-
nected with the boxes b' and provided with
5 projections c², c³, the springs c⁵ between the
pieces c and the boxes b', stationary frames
b⁴, above the boxes and pivoted cams c⁴ car-
ried by the frames b⁴ and located between

the projections c², c³, and a connection b⁵ be-
tween the two cams c⁴. to

In testimony of which invention I have
hereunto set my hand.

WM. LIDDELL.

Witnesses:

ERNEST HOWARD HUNTER,
JAMES HOWLAND.