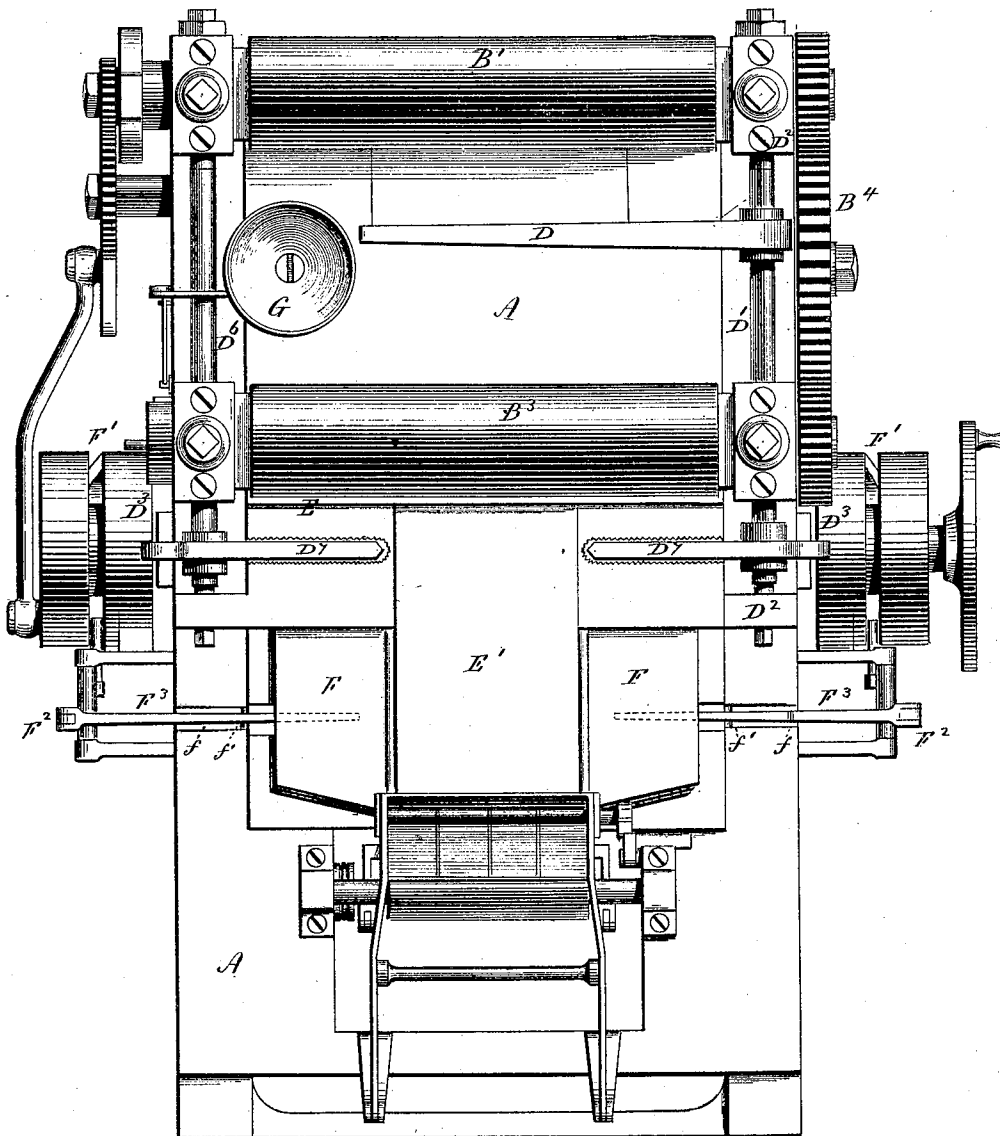


O. W. STOW.
PAPER BAG MACHINE.

No. 178,344.

Patented June 6, 1876.

Fig. 1



Witnesses
J. C. Chumway
Oliver Broughton

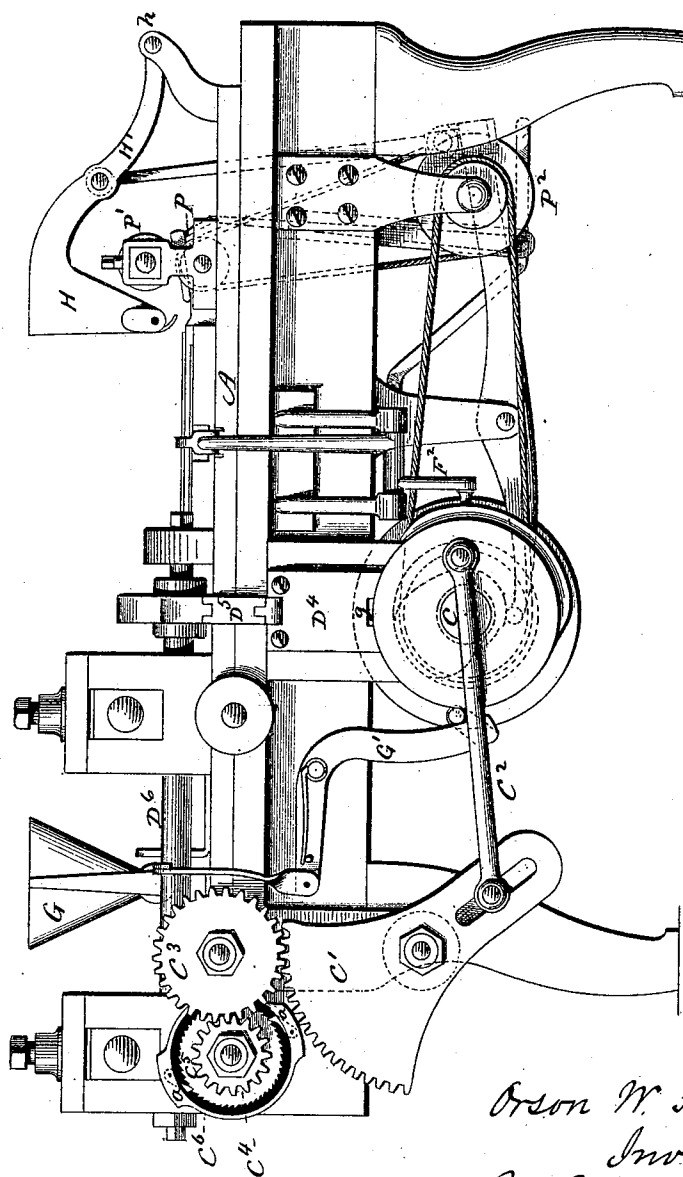
Oscar W. Storr
Inventor
By Atty.
J. H. Earle

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Fig. 2.



Witnesses

A. S. Shumway.

Clara Broughton.

Orson W. Storr

Inventor

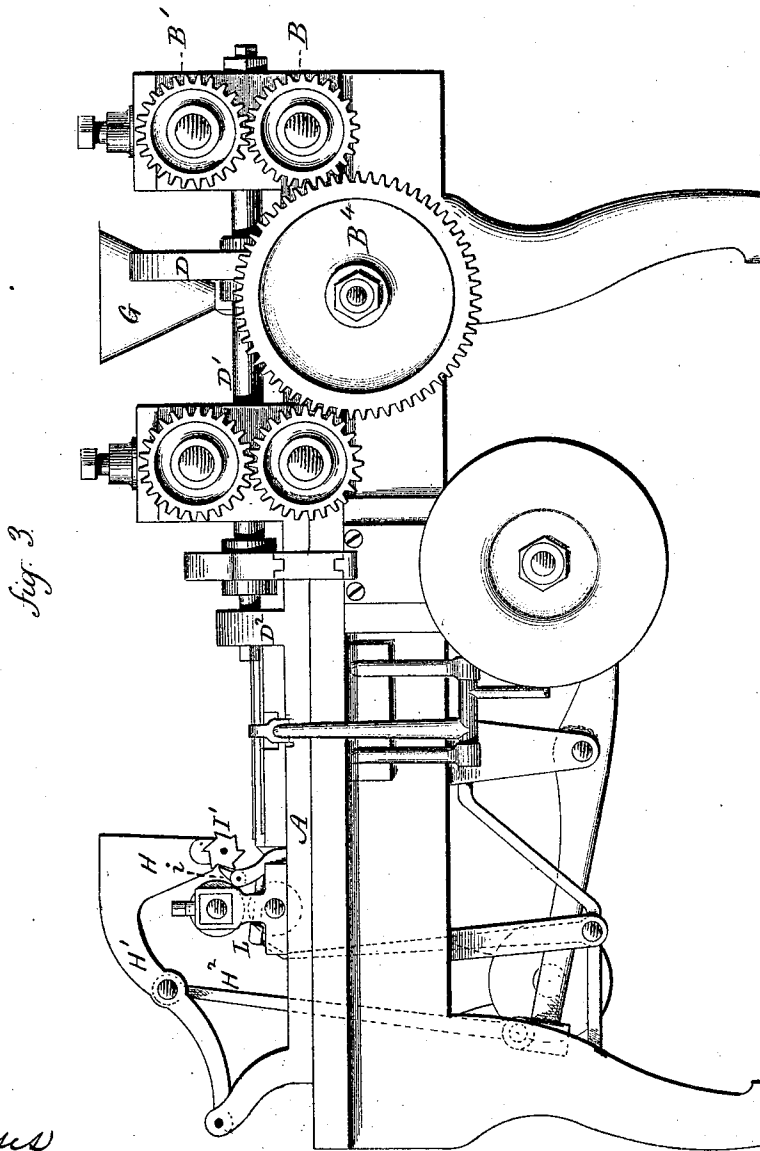
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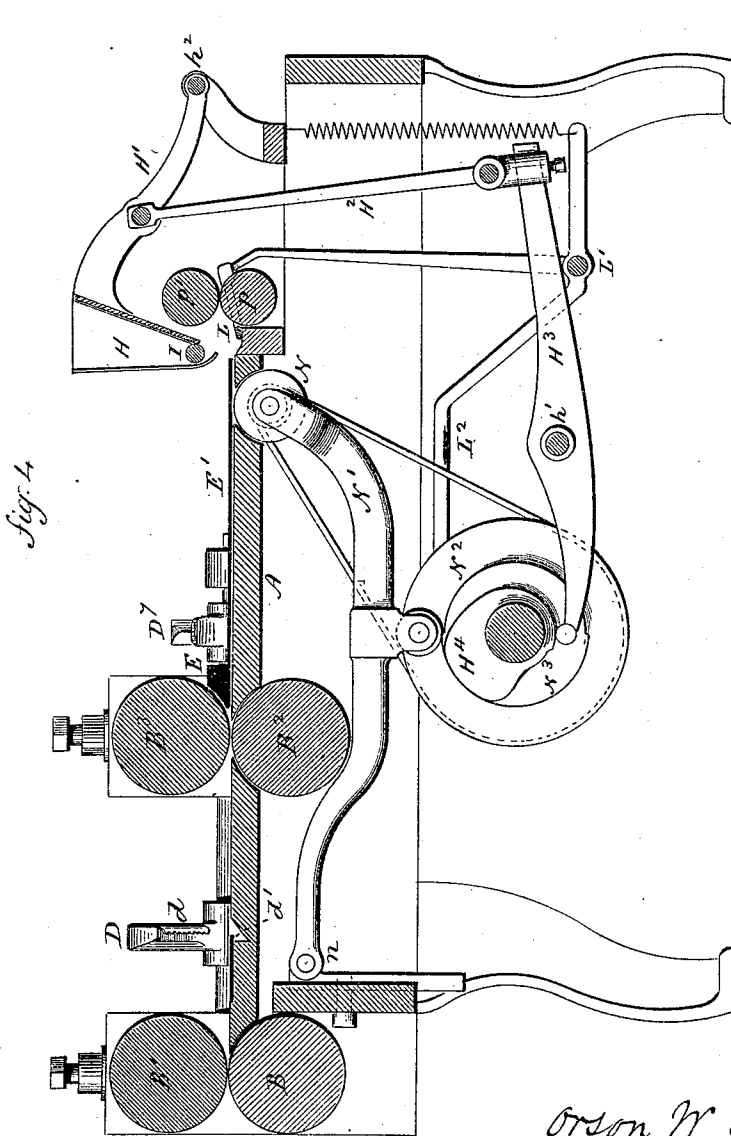
A. H. Chumway
Clara Broughton.

Orson W. Storr
Inventor
By Atty.
Wm. C. Cook

O. W. STOW.
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Witness
J. H. Shumway
Clara Broughton.

Orson W. Stow
By Atty. Inventor
Wm. O. Earle

O. W. STOW.
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fig. 5.

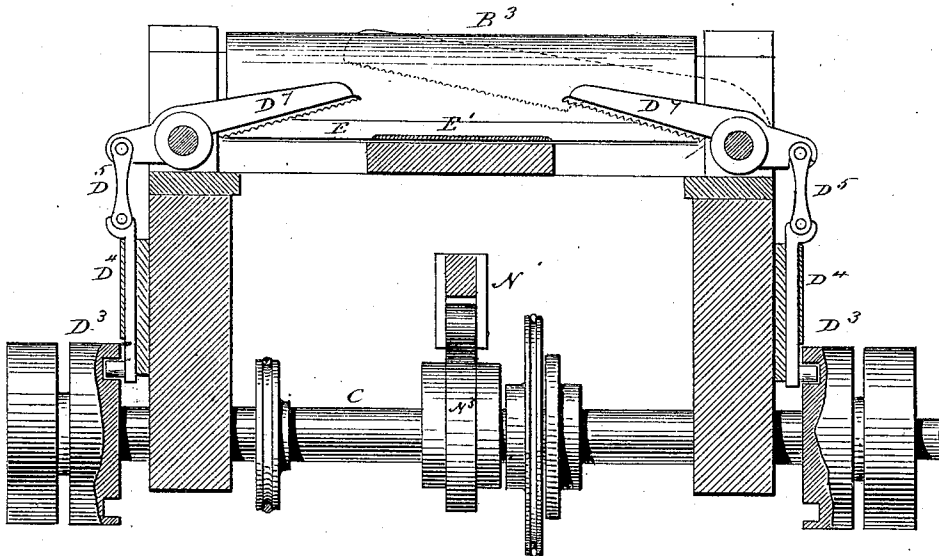
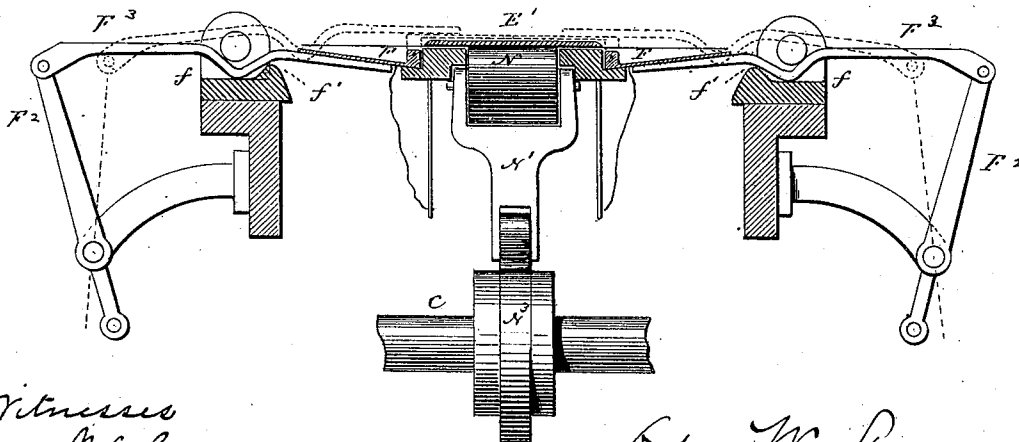


fig. 6.



Witnesses

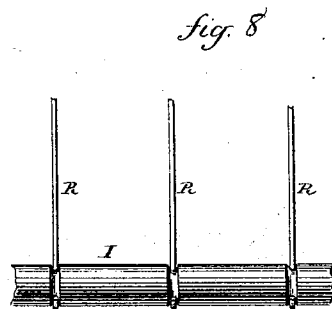
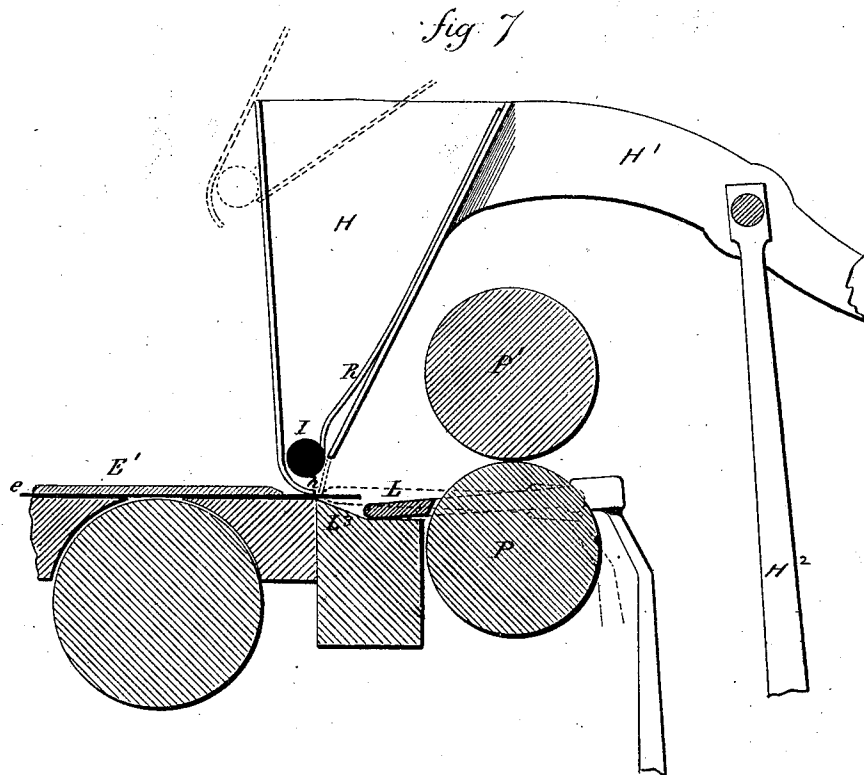
A. H. Shumway
Oliver Broughton

O. W. Stow
Inventor
By Atty. *Wm. S. Earle*

O. W. STOW.
PAPER BAG MACHINE.

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Witnesses
O. H. Shumway.
Clara Droughton.

Orson W. Stow
Inventor
By Atty.
John F. Carle

O. W. STOW.
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fig. 9

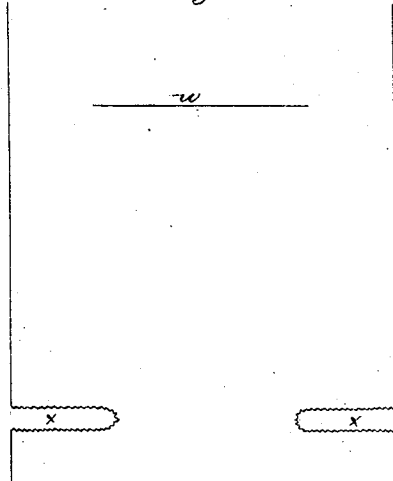
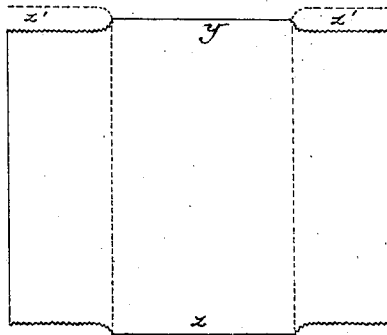


fig. 10



Witnesses

C. H. Chumway.

Clara Broughton.

Orson W. Stow

Inventor

By atty.

John E. Earle

UNITED STATES PATENT OFFICE.

ORSON W. STOW, OF SOUTHTON, CONNECTICUT.

IMPROVEMENT IN PAPER-BAG MACHINES.

Specification forming part of Letters Patent No. 178,344, dated June 6, 1876; application filed September 21, 1875.

To all whom it may concern:

Be it known that I, O. W. STOW, of Southington, in the county of Hartford and State of Connecticut, have invented a new Paper-Bag Machine; and I do hereby declare the following, when taken in connection with the accompanying seven sheets of drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, plan or top view; Fig. 2, side view from the left; Fig. 3, side view from the right; Fig. 4, longitudinal section; Fig. 5, transverse section on line 2 2; Fig. 6, transverse section on line 3 3; Figs. 7, 8, detached views; Figs. 9, 10, diagrams.

This invention relates to an improvement in machines for the manufacture of that class of paper bags which are made by doubling the two edges of a blank, one onto the other, and securing together, and one end closed by doubling that end back and pasting it onto the body; and the invention consists in the combination of mechanism, as fully hereinafter specified, whereby the blank is cut from the strip into the required form, folded, pasted, the bottom closed, and the bag discharged complete from the machine.

Before proceeding to the description of the machine, I will describe generally the method of forming the bag, as illustrated in the diagram, Fig. 10.

The blank is cut in the shape there shown, which is that of a parallelogram, with a projection, *y*, at one end, and *z* at the other, the extreme length of this projection being the width of the bag to be produced, and the part at each side of these projections a little more than one-half the width of the central portion. These sides are folded over onto the center, the edge of one side overlapping that of the other, and these overlapping edges pasted together. Then one of the projecting ends is folded over onto the overlapped sides and pasted down to close and form the bottom of the bag. The other end, projecting, forms a flap to facilitate the opening of the bag for the purpose of filling. The blanks are cut successively from a strip of paper of the width required to make the bag complete, by cutting

a piece from each edge of the strip, as at *z'*, Fig. 10, twice the width of the projecting ends, and extending into the strip the width of the overlapping sides, and a single cut from the center of one notch to the center of the other, so that forming a projecting end of one blank forms at the same time the opposite projecting end of the other blank.

I will now proceed to the description of the machine.

A is the bed of the machine, supported upon a suitable frame-work; B and B¹, the first or principal feed-rolls, geared together, as indicated in Fig. 3. To these rolls an intermittent rotation is imparted from the driving-shaft C, as seen in Fig. 2, through a segmental gear, C¹, connected by a rod, C², to a crank on the driving-shaft, the segment working into a pinion, C³, which rotates back and forth as the segment is oscillated.

The pinion C³ works into a pinion, C⁴, loose on the shaft of the lower driving-roll B, and in connection with a toothed ratchet, C⁵, and fast to the shaft B, is an arm or head, C⁶, carrying one or more pawls, *a*, engaging with the teeth of the ratchet C⁵, so that in one direction the rotation of the ratchet engages the roll, and imparts a corresponding revolution to the roll, and returning the ratchet leaves the roll free. The extent of the rotation of the roll corresponds to the length of the blank for the bag to be produced, and is made adjustable by a slot in the segmental gear C¹, to give a greater or less throw to the segment, and, consequently, a greater or less extent of revolution to the roll. Forward of the principal rolls B B¹ are two similar auxiliary rolls, B² B³. These are geared together like the first or principal rolls, and to the first by an intermediate gear, B⁴, as seen in Fig. 4, so that the extent of rotation of the two pairs of rolls is the same. Paper of the required width is introduced between the principal rolls, and passed to the auxiliary rolls, and so that the paper will run and lie flat upon the bed between the two pairs of rolls. Between these two pairs of rolls the first cut to form the blank is made, and this is done by a cutter, *d*, formed upon, or attached to, an arm, D. This arm is attached to a shaft, D¹, by the side of the machine at right angles to the rolls,

and supported in bearings D^2 . An oscillating movement is imparted to this shaft by means of a face-cam, D^3 , through a slide, D^4 , and a connecting-rod, D^5 , so that at each revolution of the shaft a full oscillation is imparted to the cutter-arm D , which passes down, and, in connection with a stationary cutter, d' , in the bed, cuts the paper on the line w in the diagram, Fig. 9. This cut is the central or separating cut across the projecting ends. On the opposite side of the machine is a shaft, D^6 , similar to the shaft D^1 , and forward of the auxiliary rolls on each of these shafts is an arm, D^7 . The shaft D^6 is actuated from cam D^3 on the driving-shaft in the same manner as described for the other shaft, D^1 , and so that the two shafts operate together. The two arms D^7 are provided with cutters to cut in the form shown in the diagram, Fig. 9, at x —that is, they cut the piece z' from each side of the blank. The distance between the center of these two last cuts and the first is the length of the blank. The table beneath the cutter-arms D^7 is provided with corresponding cutters, and with an opening through the table, so as to entirely separate the piece cut and pass out below, as indicated in Fig. 5.

The cutter-arm D is made adjustable on its shaft to a greater or less distance from the cutter-arms D^7 , so as to vary the size of the bag, the cutter in the table being adjusted accordingly. The feed or revolution of the rolls occurs between the operation of the cutters, and the extent of the feed corresponds to the distance between the two, so that at each full revolution of the feed and operation of the cutters a completely-cut blank is delivered forward of the cutter-arms D^7 .

Forward of the auxiliary rolls is a transverse bar, E , supporting a tongue or thin plate, E' . (Indicated in Fig. 1, and in solid black, Fig. 4.) This plate E' is of the width of the bag to be produced, and lies near the table, but so as to allow the paper to pass beneath it, as indicated in Fig. 7, the solid black e denoting the paper. The forward end of the plate E' , which is at right angles to the sides, is in such relative position to the cutter-arms D^7 that when the blank is finally separated by those cutters the forward end of the blank will extend beyond the plate E' sufficient to make the fold or double for the bottom. Under this plate E' the blank is left after its final separation from the principal strip, the sides of the blank projecting each side from the plate E' .

Close to each edge of the plate E' , but below and parallel with it, a folder, F , is hinged, which allows the blank to pass freely over them, as indicated in Fig. 6; then, after the final separation of the blank from the strip, the folders are turned up, carrying with them the two sides of the paper over and down and onto the plate E' , the edge of one side overlapping the edge of the other, the time of one folder being a little in advance of the other, so that one side is laid before the other comes onto it. These folders are thus actuated by

grooved cams F^1 on the driving-shaft through levers F^2 and arms F^3 , the said arms formed with an incline, f , on their under side, to work up and over the stationary projection f' on the bed, as indicated in Fig. 6.

One edge of the strip of paper from which the blanks are cut is coated with paste from a hopper, G , the hopper being constructed in the usual manner to deliver the requisite amount of paste onto the edge. If this delivery of the paste be continuous, the pieces subsequently cut from that edge would adhere to the cutter. To prevent this the pasting apparatus is raised from the paper at the point where that cut is to be subsequently made, and it is thus raised by means of a lever, G' , actuated by a cam, g , on the driving-shaft, the said pasting apparatus being connected to one arm of the lever, so that as the cam g comes in contact with the other arm of the lever it will raise the pasting apparatus, and this occurs at that point in the paper where the subsequent piece is to be cut, and the time corresponds to the width of the piece cut.

The next operation is to fold the projecting forward end over onto the bag, so as to close that end. For this purpose a transverse paste-hopper, H , is hung upon arms H^1 , pivoted to the bed at h^2 , this hopper being at least as long as the width of the bag.

From the arms H^1 a connecting-rod, H^2 , extends downward, and is connected to one arm of a lever, H^3 . This lever is hung upon a fulcrum, h^1 , and the other arm extends back to the driving-shaft, where it is operated upon by a cam, H^4 . This cam serves to raise and lower the hopper at the required time—that is, the hopper falls after the projecting end of the blank has passed beyond the plate, as seen in Fig. 7, and, after the paste is properly applied, the hopper rises, as denoted in broken lines, Fig. 7.

At the mouth of the hopper is a lip, h , which bears upon the paper on the line where the fold is to be made to close the bottom. In the mouth of the hopper is a roll, I . (Denoted in solid black, Fig. 7, and in side view, Fig. 8.) This roll nearly fills the mouth of the hopper, and so as practically to prevent the paste from flowing from the hopper. On the outer end of this roll is a ratchet-wheel, I' , and fixed to the bed is a pawl, i , so that as the hopper descends the ratchet will strike the pawl and cause a partial rotation of the roll within the hopper.

The surface of the roll is coated by the paste in the hopper, and this rotation of the roll presents the coated surface of the roll to the paper below.

Forward of the hopper a folder, L , is arranged, hung upon a rock-shaft, L^1 , and actuated by a cam on the driving-shaft, through a lever, L^2 , as seen in Fig. 4. The forward edge of this folder rides upon an incline, L^3 , (see Fig. 7,) and so that as it moves forward to the position denoted in broken lines it will pass beneath the projecting end of the paper,

and turn it up over the lip *h*, against the pasting-roll, as seen in broken lines, Fig. 7, to be coated with paste by contact with the surface of the roll. This defines the line of fold for the bottom, the hopper rises, and the folder falls back, leaving the paper coated with paste and partially folded.

Beneath the plate *E'*, and below the surface of the table, is a feed-roll, *N*, hung in an arm, *N*¹, and caused to revolve with considerable rapidity from a pulley, *N*², on the driving-shaft. (See Fig. 4.) This feed-roll *N* works through a groove in the bed. The opposite end of the arm *N*¹ is hinged at the rear, as at *n*; intermediately it bears upon a cam, *N*³, on the driving-shaft. This cam is constructed, as shown, so that while the blank is being fed into the machine beneath the plate *E'*, the sides folded, and the end pasted, it lies below the surface of the bed; but so soon as the end is pasted, as before described, then the rise of the cam, as shown in Fig. 4, raises the roll, so as to bear upon the under fold or side of the partially-completed bag, and by its friction force the bag forward longitudinally from the plate *E'* toward rolls *P P*¹. These rolls are driven rapidly from a pulley, *P*², beneath, or one may be driven from the other.

The partially-folded end, as it enters between the rolls, is turned down and pressed upon the surface of the bag. These rolls then draw the bag forward, pressing the pasted surfaces, and throw it complete from the machine.

To prevent the too strong adhesion of the paper to the pasting-roll *I*, several springs, *R*, preferably formed of wire, are arranged in the hopper to extend down, around, and lie in grooves in the hopper, as shown in Figs. 7 and 8. At rest, however, they project somewhat from the surface of the roll; but when the paper is pressed against the roll they fall back into the grooves of the roll, and so soon as the folder falls back, after having pressed the paper against the roll, these springs react, and press the paper away from the roll.

In arranging the cutters to form the cuts,

as before described, it is preferred that the center cut be made before the edges or wastes are cut; but this is not essential, as the order of cutting may be reversed.

The form of the cut is so as to make a notched or saw-tooth cut, such cut being more positively made than a straight cut, as well as affording a better condition of the paper for sticking the bottom fold.

I claim—

1. In a machine for making paper bags, the combination of the center cutter and two side or waste cutters, the said center cutter arranged distinct from the side cutters, the length of the blank to be cut, and so that the blank is completely formed and separated from the strip of paper before the folding commences, substantially as described.

2. In a machine for making paper bags, the combination of the center and two side or waste cutters, arranged relatively to each other as described, with the edge-pasting device arranged and operating to skip the surface of the side cut or waste, substantially as set forth.

3. In a machine for making paper bags, the combination of the center cutter *d* and two side or waste cutters, *D*¹, each cutting or separating a piece from the blank, the principal and auxiliary feeding-rolls, with the stationary plate *E'*, upon which the blank is folded complete, substantially as specified.

4. The combination of the feed-rolls *B*² *B*³, the plate *E'* above the bed *A*, the feed-roll *N*, hung in a lever, *N*¹, and cam *N*², to intermittently present the said roll *N* upon the under side of the plate *E'*, to aid in drawing in the blank and discharging the bag, substantially as described.

5. In a hopper for supplying paste, an annularly-grooved roll, combined with springs resting in said grooves, substantially as and for the purpose specified.

O. W. STOW.

Witnesses:

E. B. HOLCOMB,
GEO. F. NEWBERRY.