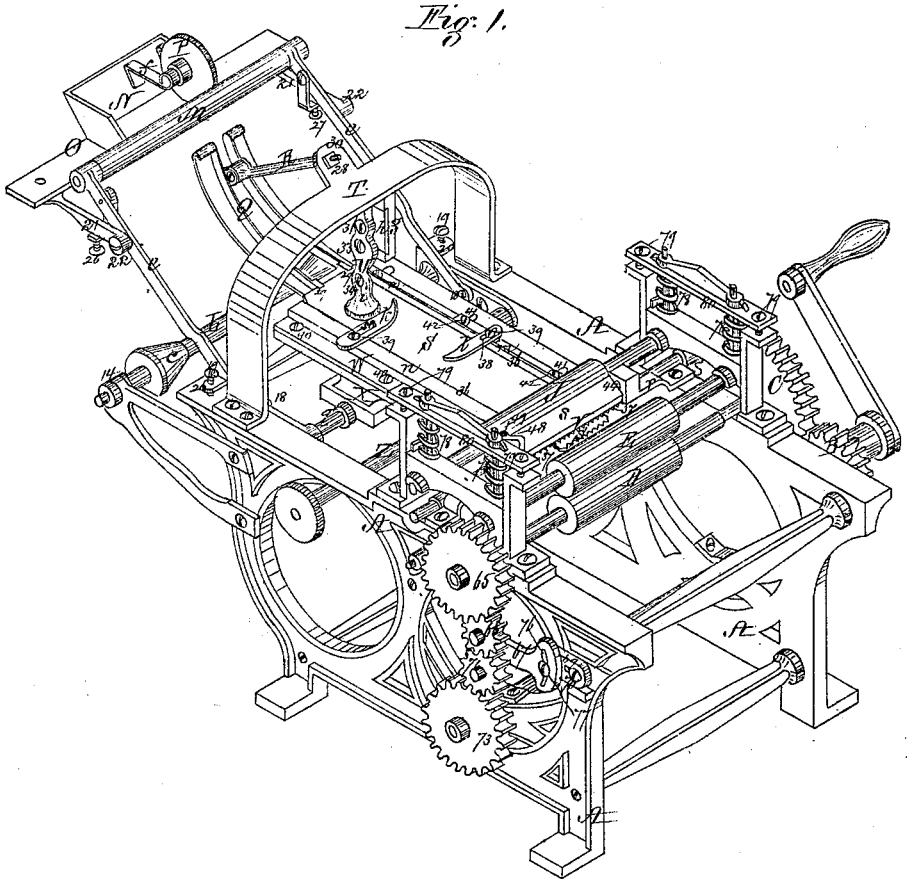
3 Sheets. Sheet 1.

C. F. Annan,

Bag Machine.

No. 111,802. Patented Feb 14. 1871.

Fig: 1.



Witnesses,
N. W. Stearns
W. J. Cambridge

Inventor,
C. F. Annan

3 Sheets, Sheet 2.

C. F. Annan,

Bag Machine.

No. 111802. Patented Feb. 14. 1871.

Fig. 4.

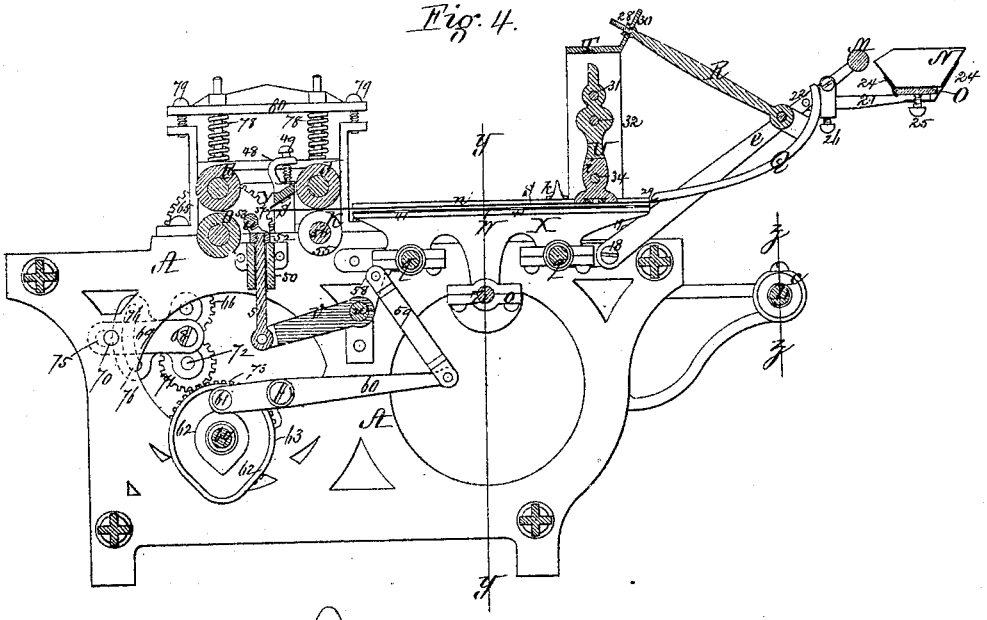
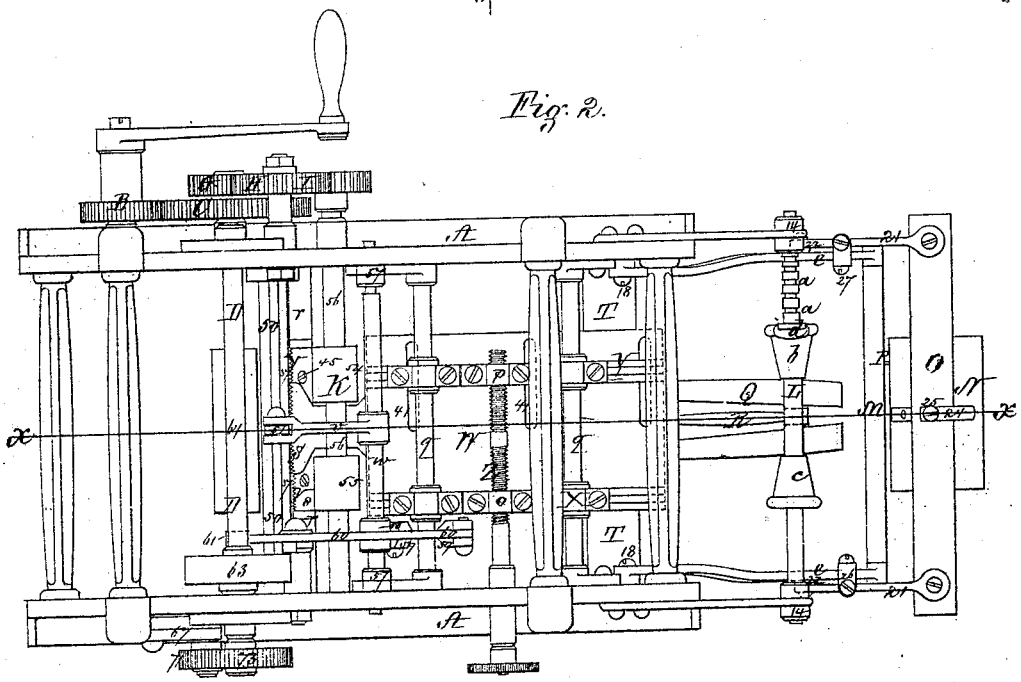


Fig. 2.



Witnesses,
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W. J. Cambridge

Inventor,
Chas. F. Annan

3. Sheets Sheet 3.

C. F. Aman,

Bag Machine.

No. 111,802. Patented Feb 14, 1871.

Fig: 3.

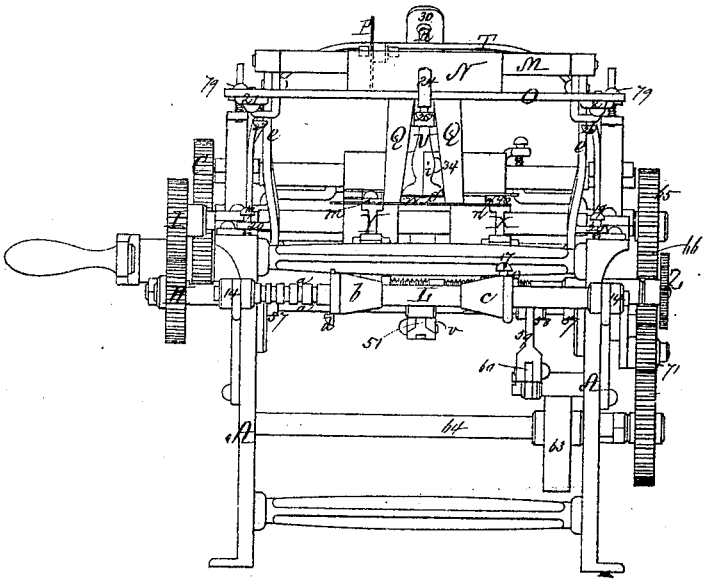

Fig: 8.

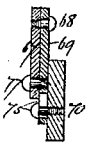

Fig: 5.

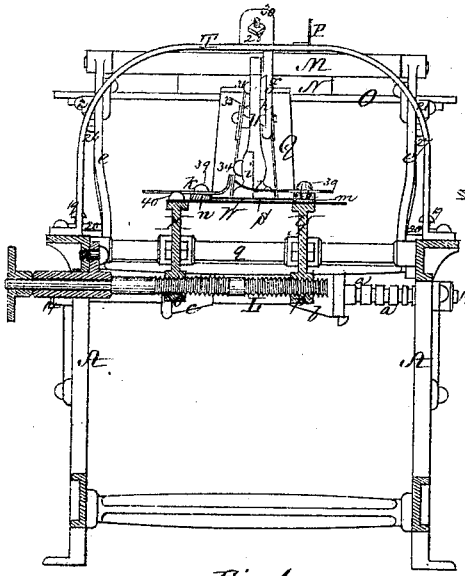

Fig: 7.

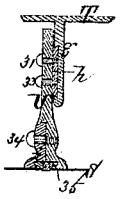

Fig: 12.

Fig: 9.

Fig: 11.

Fig: 10

Fig: 6.

Witnesses,
N. W. Stearns
W. J. Cambridge

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United States Patent Office.

CHARLES F. ANNAN, OF BOSTON, ASSIGNOR TO HIMSELF AND HERBERT S. MERRILL, OF CAMBRIDGE, MASSACHUSETTS.

Letters Patent No. 111,802, dated February 14, 1871.

IMPROVEMENT IN PAPER-BAG MACHINES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, CHARLES F. ANNAN, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Machines for Making Paper Bags, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing making part of this specification, in which—

Figure 1 is a perspective view of my improved machine for making paper bags.

Figure 2 is a plan of the under side of the same.

Figure 3 is a rear elevation of the same.

Figure 4 is a longitudinal vertical section on the line *x x* of fig. 2.

Figure 5 is a transverse vertical section on the line *y y* of fig. 4.

Figure 6 is a transverse vertical section on the line *z z* of fig. 4.

Figures 7, 8, 9, 10, and 11, details to be referred to.

My invention consists, firstly, in a grooved shaft or spindle provided with sliding conical collars, between which is placed the roll of paper to be made into bags, the distance between the centers of two consecutive grooves being exactly equal to one-half of the difference in the widths of two sheets of paper of consecutive sizes, the sliding collars being brought snugly against the ends of the roll, and being clamped when adjusted in position, thereby holding the paper as it is fed forward truly in a line with the center of the machine; and

My invention consists, secondly, in suspending the "leading roll" in bearings in arms loosely pivoted to the frame-work, and in adjusting these arms by set-screws or otherwise to bring the axis of the roll in the plane required for smoothly conducting the sheet of paper centrally in the line of draft; and

My invention consists, thirdly, in supporting the paste-box by arms pivoted loosely to the arms in which the leading roll revolves, and also in adjusting the said arms supporting the paste-box, by set-screws or otherwise, with reference to the leading roll, so as to nicely regulate the distance between it and the periphery of the wheel which lays the paste on the paper, the said wheel resting in spring bearings and its box sliding longitudinally to bring the periphery of the wheel over the point or edge of the paper where the paste is to be delivered, these several adjustments being necessary to accommodate sheets of paper of different widths and thicknesses without wrinkling; and

My invention consists, fourthly, in providing the bar of the knife which severs the bag from the paper strip with a device by which the inclination of the knife with respect to the "brake" and "former" may be regulated as required, together with certain adjustments made by slots and set-screws by which the knife may be moved in a horizontal plane to bring its edge at the proper distance in the rear of the former; and

My invention consists, fifthly, in a brake provided with a roller, whereby the friction on the paper strip is materially reduced and the liability of its being torn or misplaced avoided; and

My invention also consists in certain minor details to be referred to hereafter.

To enable others skilled in the art to understand and use my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawing—

A is the frame-work, in bearings on the outside of which is made to revolve a shaft provided with a gear, B, which drives a gear, C, on one end of the lower one, D, of the front pair of feed-rolls, the upper roll E being revolved by the friction communicated through the paper strip thereto or by gear, if preferred.

G H I are gear by means of which the rear pair of feed-rolls J K are revolved.

A roll of paper of the proper width to form a bag of the required size is placed on the shaft or spindle L, which rests in bearings 14 in the frame-work, and is provided with a series of grooves, *a*, the distance between the centers of two consecutive grooves being exactly equal to one-half the difference between the widths of two sheets of paper of consecutive sizes in order that sliding collars *b c* may be brought up to the ends of rolls of paper of varying widths.

The outer end of the collar *b* is provided with an inclined dovetailed groove for the reception of a correspondingly-formed piece, *d*, provided with two openings, 15 16, connecting with each other, (see figs. 6 and 11,) the opening 15 being of a size sufficiently large to allow of the piece slipping freely along the shaft, when brought in a line concentric therewith, to adjust it to the end of the roll of paper to be used, and the opening 16, being smaller than that 15, to prevent the sliding of the piece *d*, after adjustment, from the particular groove in which the collar *b* is to be secured, the sliding piece and the dovetailed groove being tapering or wedge-shaped, as seen in fig. 11, so that, when the center of the opening 16 is brought in line with the axis of the shaft, the piece will be securely held in the collar to prevent its being moved laterally on the shaft away from one end of the roll of paper.

The end of the shaft or spindle opposite to that provided with grooves is flattened to allow the collar *c*, when adjusted, to be securely clamped in place by a set-screw, 17.

In addition to the adjustments described for the accommodation of rolls of paper of varying widths, and

supplementary to said adjustments, I design to provide a means whereby the spindle L may be moved longitudinally, if necessary, to bring the roll of paper into its true position.

The sheet of paper is now conducted up over a "leading roll," M, which has its bearings in the upper ends of arms *e*, pivoted at their lower ends 18 to the frame-work. This leading roll is made adjustable to bring its axis into the plane required for the proper delivery of the paper by means of set-screws 19 passing through projections 20 on the outside of each of the arms *e*, by which construction either or both of the upper ends of the arms are raised or depressed as required.

N is a paste-box resting on a cross-bar, O, which is supported at its ends on the outer extremities of short arms 21, pivoted at 22 to the arms *e*, in which the leading roll M revolves.

The lower side of the paste-box is provided with a guide, 24, by which it is kept in position while being slid longitudinally along the dovetailed edges of the cross-bar O, a set-screw, 25, being turned down thereon when the box is in the right position to bring the periphery of a wheel, P, which distributes the paste, immediately over one edge of the paper strip.

The paste-wheel P rests in spring bearings *f*, fig. 1, and the distance of its periphery from the leading roll is regulated by operating set-screws 26 and 27, which also serve to keep the wheel P in a vertical position, by which construction paper of various thicknesses may pass under the wheel and be supplied with paste as required, the spring bearings enabling the wheel to yield and conform to inequalities which often occur in the thickness of the paper.

From the leading roll the paper is drawn, in a line with the center of the machine, under a curved guide, Q, of the form seen in fig. 4, the curvature of the upper ends being such as to admit of folding the edges of the paper.

The upper ends of the curved guide Q may be raised or depressed by shortening or increasing the length of a brace or support, R, by turning the nut 28 in order that the guide may receive the pitch required for bags of different sizes.

The lower ends of the curved guide Q are provided with tapering or beveling edges, in order that the paper strip may be shaped and creased preparatory to going under a former, S, against which the front edge of the curved guide rests, the said edge being notched at 29, and resting upon the rear edge of the former, in order that the curved guide may be free to be adjusted to any inclination by means of the brace or support R, and may be readily removed to substitute guides of different widths corresponding to the widths of various-sized bags.

As the curved guide above referred to forms the subject-matter of another application for Letters Patent made by me simultaneous with the present application, I do not deem it necessary to more particularly describe its construction here.

Extending transversely over the frame-work is a bridge-piece, T, of arched form, through a projection, 30, rising from which passes the upper end of the brace or support R.

In a horizontally-grooved stud, *g*, figs. 1 and 7, proceeding vertically down from the under side of the bridge-piece, slides a block, *h*, to which is secured, at 31, the upper end of a vertical arm, U, which, by means of a slot and screw 33, may be swung upon and clamped to the sliding block *h*, to regulate the distance of the front edge of the former S from the edge of the knife V, which severs the bag from the paper strip.

The foot of the arm U is split, so as to form two pieces, one, *i*, of which may be brought up against or removed from the main portion of the arm by operating a screw, 34, the under side of the foot being provided with a dovetailed circular groove, to enable it to be fitted over and secured more or less loosely to a projection, 35, of corresponding form, on the outer end of the former, by which construction the front edge of the former may be swung laterally around or be raised or depressed and advanced to a point slightly forward of the knife, so as to simply touch without pressing upon the under side of the upper one K, of the rear pair of feed rolls J K, these adjustments being necessary to allow the former to swing freely on its pivot, and be directed by the paper into line with the draft of the machine, thereby avoiding the wrinkling of the paper.

As also the arm U forms the subject of an application for Letters Patent made by me simultaneous with the present application, and that for the curved guide previously referred to, it will be unnecessary to further relate to it here.

The width of the rear end of the "former" is less than that at the points 36, and tapers gradually between these points, and the edges of both sides of the former are beveled so that the paper in its passage under the former may be smoothly spread or drawn out as required.

The front of the former instead of being provided with a knife-edge is provided with a series of notches or serrations, 37, and the edge of the knife is also similarly constructed; this form being better adapted for severing the bag from the strip without unnecessary friction and without injury to the paper.

After passing under the curved guide Q the central portion of the paper strip is conducted on a flat bed-plate, W, under the former, the edges of the paper being partially bent over by passing under and in contact with guide-fingers *k l*, of the form shown in figs. 1 and 5, these fingers being provided with slots 38 and set-screws 39, by which they are made adjustable longitudinally to and from the center of the machine, and also made to swivel in the arc of a circle in order that the under fold of the paper, when being turned over, may not come in contact with and remove the paste from the outer fold.

The bed-plate W is adjustable laterally to accommodate formers of different widths required in making bags of different sizes by mechanism now to be described.

Underneath the sides and supporting the bed-plate are two frames, X Y, to the former of which one side of the bed-plate is permanently secured by screws 40, while the other side of the bed-plate is provided with slots 41 for the reception of screws 42, passing through a strip which serves as an adjustable guide, *m*, for one side of the former, by which construction the bed-plate and its frames X Y are free to be moved laterally by a right-and-left-handed screw-shaft, Z, to accommodate formers of various widths and to bring them centrally into the proper position to allow of their being freely moved into the line of draft by the strip of paper passing under it.

n is a stationary strip or guide, secured through the frame X to the bed-plate.

The right-and-left-handed screw-shaft Z passes through correspondingly-formed screw-nuts *o p*, the frames of the bed-plate resting and sliding upon circular guides *q q*, secured to the frame-work of the machine.

It will thus be seen that by operating the screw-shaft Z the bed-plate may be readily moved, laterally, to bring its stationary guide *n* up to one edge of the paper strip bent over the former, while the slots 41 and screws 42 afford a convenient means of bringing the sliding guide *m* into its position with respect to the other edge of the former.

Extending transversely from the sides of the machine and secured thereto are two studs, *r r*, between

which is pivoted, at 44, a knife-bar, *s*, to which is secured the knife V, provided with slots and screws 45, by which it may be adjusted thereon to compensate for wear.

The ends of the studs are intended to be provided with slots 47, (see fig. 10,) to allow of the bar *s*, with its knife V, being moved in a horizontal plane above the former to regulate the amount of space which it shall be placed in, the rear of the front edge of the former and its position with respect to the brake *u*, presently to be explained.

One end of the knife-bar is provided with a bent projection, 48, through which passes a screw, 49, the lower end of the screw being turned down upon one of the studs *r*, so as to incline the knife at a greater or lesser angle down toward the edge of the former and toward the brake, which becomes necessary when severing bags from paper strips of more than ordinary thickness.

50 is a transverse bar, whose ends are secured to the sides of the frame-work, the center of the bar being provided with a cylindrical opening for the reception of and to guide a vertical rod, 51, to the top of which is secured a cross-piece, 52, provided with a roller, 53, the two forming a brake, *u*, which rises at every length of a bag against the paper strip to press it against the edge of the former and that of the knife, to sever the bag with its unclosed bottom therefrom, the outer fold, provided with paste, being pressed down on, and stuck to the under fold by the passage of the strip under the rear pair of feed-rolls, J K, the lower roll K being formed of two collars, 54 55, which are made to slide upon a shaft, 56, and are clamped at the required distance from each other to accommodate formers of different widths.

The roller 53 of the brake is designed to produce only sufficient friction on the paper strip to enable it to sever the bag from the strip without dragging on and injuring it and without retarding its progress through the feed-rolls.

The mechanism by which the brake-roller is brought up periodically will now be described.

The lower end of the vertical rod 51 of the brake-roller is pivoted to one end of a short arm, *v*, the other end of the arm being secured to a rocker-shaft, *w*, resting in bearings 57 in the frame-work.

58 is another short arm, having one end secured to the rocker-shaft *w*, while its opposite end is pivoted to the upper end of an arm, 59, the lower end of which is pivoted to one end of a long lever, 60, pivoted to a short pin projecting from the inside of the frame-work.

The other end of the lever 60 is provided with a roll, 61, which fits into a cam-groove, 62, in one side of a cam-wheel, 63, secured to and revolved by a shaft, 64, (put in motion by the feed-rolls through a series of gears, to be described,) the revolution of the cam-wheel serving to raise and depress the roll 61, and, through the connections just explained, causing the brake-roller to be carried up against the under side of the paper strip at every length of a bag, to sever it therefrom, as desired.

One end of the shaft of the lower front feed-roll D projects outside of the frame-work and carries a gear, 65, which drives a pinion, 66, which has its bearings in one end of a bifurcated plate, 67, pivoted at 68 to a short stud, 69, figs. 1 and 8, secured to the frame-work at 70; the pinion 66 engaging with a similar pinion, 71, having its bearings in the opposite end 72 of the bifurcated plate 67.

The pinion 71 drives a gear, 73, on the end of the cam-shaft 64, which projects outside the frame, and, as previously mentioned, the brake-roller is actuated periodically, as required.

The times at which the brake-roller is elevated into contact with the paper strip are governed by the length of the bag to be made, and, therefore, it becomes necessary to provide a means whereby it may be brought up more or less often.

This is done by adjustments of the bifurcated plate 67, in connection with different sizes of gear applied thereto.

The stud 69 is intended to be moved longitudinally on the frame-work by means of a screw, 70, passing through a slot, 75, (see fig. 8,) in the stud in order that the point 68, where the bifurcated arm is pivoted thereto, may be moved so as to increase or diminish the distance between the center of each pinion and the gear with which it engages, to allow of the substitution of gear of different diameters.

To still further aid in the adjustment of these gears, the bifurcated plate 67 is provided with a slot, 76, (see figs. 1, 4, and 8,) for the passage of a screw, 77, into the stud 69, by which construction the bifurcated plate may be made to swivel on its pivot 68, thereby again changing the position of the center of each pinion, relative to the center of its gear.

The bearings of the ends of the several feed-rolls are open and the pressure of the upper one of each pair upon its lower one is controlled by spiral springs 78, the tension of which is regulated by set-screws 79, passing through the ends of a cross-piece, 80, on the under side of which the tops of the springs bear, the spring bearings yielding to conform to any irregularity in the feed-rolls or inequality in the paper strip as it is being fed through the machine.

By means of the above-described adjustments of the curved guide, former, bed-plate, knife, brake-roller and other mechanism, I am enabled in one and the same machine to make bags of all the various sizes required.

Claims.

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

1. A grooved shaft, L, provided with sliding collars *b c*, substantially as and for the purpose set forth.

2. The leading roll M, suspended in arms *e*, pivoted to the frame-work, and made adjustable by screws or otherwise, for the purpose set forth.

3. The paste-box N, supported in arms 21, adjustable by the screws 26, in combination with the arms *e*, adjustable by the screws 19, as and for the purpose described.

4. A knife-bar, *s*, provided with a bent projection, 48, and screw, 49, for regulating the inclination of the knife V, with respect to the brake-roller and former, substantially as described.

5. A brake, *u*, provided with a revolving roller, 53, operating substantially in the manner and for the purpose set forth.

6. A slotted plate, 67, in combination with a slotted stud, 69, to allow of the employment of different-sized gear, as described.

7. A dovetailed piece, *d*, provided with openings 15 16, in combination with a sliding collar *b*, and grooved shaft L, for the purpose set forth.

Witness my hand this 26th day of November, A. D. 1870.

CHS. F. ANNAN.

Witnesses:

N. W. STEARNS,

W. J. CAMBRIDGE.