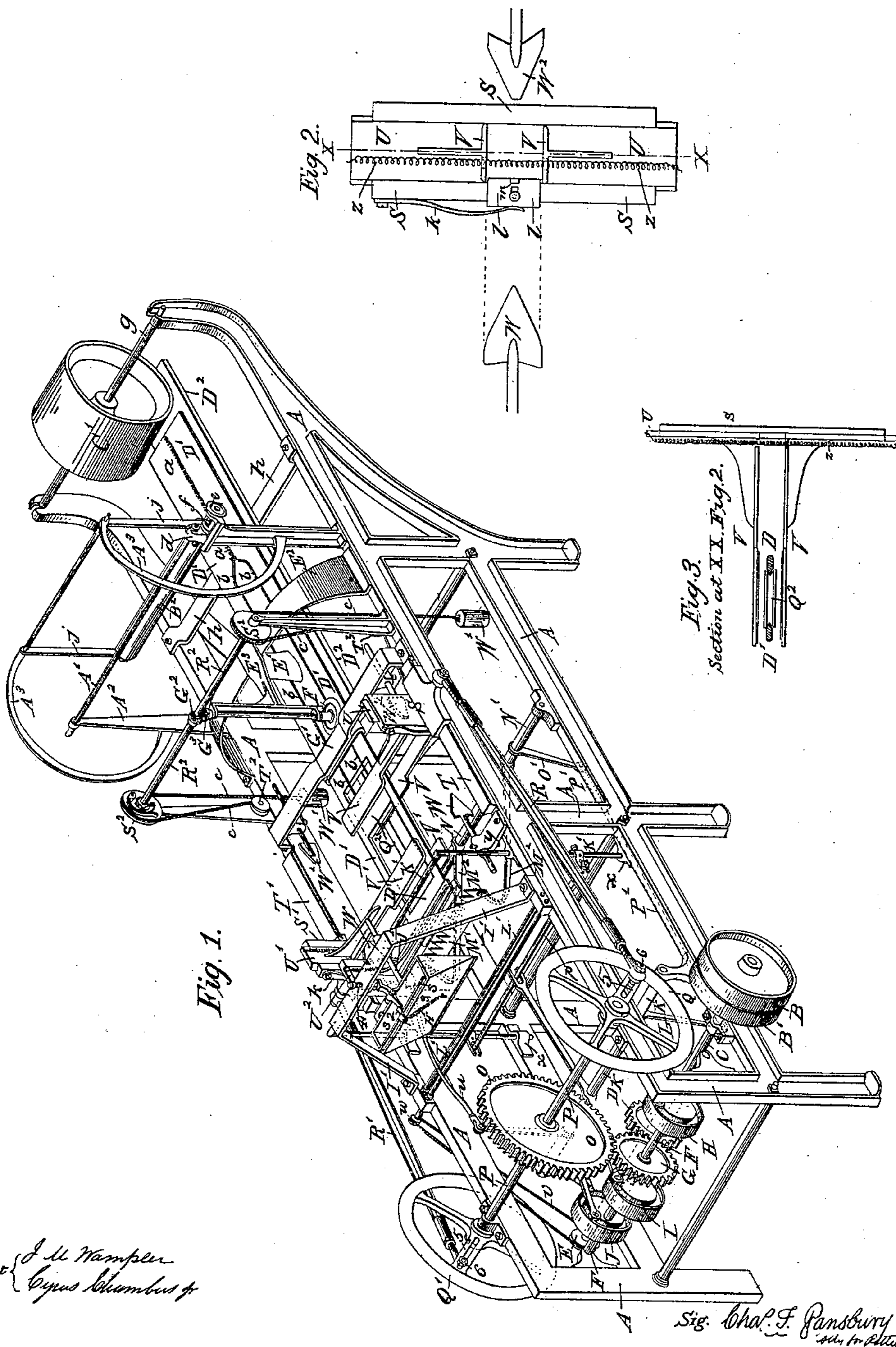


S. E. PETTEE.
Making Paper Bags.

No. 28,537.

Patented May 29, 1860.



Test { J. M. Wampler
Cyrus Schumbers &

Sig. Cha. F. Pansbury
att. for Pettee

UNITED STATES PATENT OFFICE.

S. E. PETTEE, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO NORTH AMERICAN PAPER BAG AND ENVELOPE MANUFACTURING COMPANY, OF PHILADELPHIA, PENNSYLVANIA.

PAPER-BAG MACHINE.

Specification forming part of Letters Patent No. 28,537, dated May 29, 1860; Reissued August 22, 1876, No. 7,275.

To all whom it may concern:

Be it known that I, S. E. PETTEE, of the city of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Machinery for Making Paper Bags; and I do hereby declare the following to be a correct description of the same, reference being had to the accompanying drawings, in which—

Figure 1, represents, in isometrical perspective, the machine complete; Fig. 2, is a front elevation of one of the slides, with the clamp stocks and clamps; and Fig. 3, is a vertical section through the line X X of Fig. 2.

My invention relates to machinery for making bags from a continuous roll of paper, and consists in new arrangements for the delivery of the paper to the former; pasting its edges together to form the tube from which the bags are cut; feeding the tube to the knife, and folding and pasting the closed end of the bag.

To enable others to make and use my improved machine, I will proceed to describe its construction and operation, referring to the drawings, in which the same part is marked by the same letter of reference, wherever it occurs.

The machine is supported in a strong frame A of iron, and is driven by power, from any suitable prime mover, applied to the fast pulley B, at the end of the main shaft C. B' marks the loose pulley on the same shaft. This shaft revolves in journal boxes attached to the main frame, and on it is placed cog wheel D, which gears into a similar wheel G, which may be of the same size and number of teeth, on shaft F, above and to one side of it. On the end of main shaft C, is a small pulley E, which is connected by cord v, to pulley w, on the end of one of the folding rollers L'.

The shaft F, I call the cam shaft, as it carries the three grooved cams, H, I and J, which operate respectively the bent levers attached to lever shaft K, which are marked L, M and N. Each of these levers has a pin in the end next the cam, which works in a groove in the side of the cam.

The bent lever L, which I call the knife lever, is connected by rod P', to an arm O', projecting down from rock shaft N', to

which the knife stocks M², which support the vibrating knife M', are attached. Thus the lever L, by operating the rock shaft N', gives a vibrating, up and down stroke to the knife M'.

The bent lever M, which I call the folder lever, has a fork r, at its inner end, which embraces rod p, which is connected, by an adjustable attachment, to frame K', to which is attached the handle of the folder and paster H'. Hence, when the forked end of lever M rises or falls, it causes the paster and folder H' to rise or fall also.

The bent lever N, which I call the dart lever, is operated by cam J, and is connected at its upper end, to rod u, the other end of which carries a dart which operates the stationary clamp V², by forcing its jaws asunder, when it enters between them, and allowing them to close by a spring, when it is withdrawn.

The wheel G, on shaft F, gears into wheel O, on crank shaft P. These wheels are so proportioned that the cam shaft F, shall make two revolutions to each revolution of the crank shaft P. The shaft P, is supported in proper bearings on the top of the main frame. On its ends, it carries the fly wheels Q, Q', each of which has a slotted arm 5, which receives an adjustable crank pin 6, attached to the end of one of the connecting rods R or R'. These crank pins can be adjusted to any point of the slot that may be required, to alter the throw of the crank. The connecting rods R, R', are also adjustable in length, by the threaded sleeves on their ends working on to right and left screws in the usual way, as shown.

The cranks are always on opposite centers. The ends of the connecting rods R R', opposite to those by which they are pivoted to the fly wheels, are pivoted to slides S S' which have a reciprocating movement on ways T T', the slide S being at the greatest distance from shaft P, when slide S' is nearest to it. These slides carry respectively the clamp stocks U, U', which slide vertically in a dovetail groove in the inner upright faces of the slides. This arrangement is clearly shown in Fig. 2. Attached to the sliding stocks U, U', are the clamps V, V', which are of the shape represented, and are covered on their clamping surfaces, with

corrugated india rubber, to give them a good hold upon the paper. The jaws of the clamps are held in contact by a spring z , and are opened by the sharp darts W , entering between them. Attached to the slides S, S' , are springs k , (see Fig. 2), which operate the slotted dogs l . These dogs, when the jaws of the clamps are far enough apart, are forced by spring k , between them, and hold them open until they are driven out by coming in contact with the end n , of blunt darts W^2 , which strike against the small projecting pieces m , and force the dogs back, allowing the clamp jaws to close gradually by sliding down the inclined sides of the darts. The darts W , and W^2 , are held in sleeves, in which they are adjustable, by means of set screws, so as to accommodate themselves to the changes that may be made in the throw of the cranks, for the purpose of changing the character of the product of the machine.

The slide of stationary clamps V^2 , is attached to the frame A , and those clamps are opened and closed by the moving dart, attached to the end of rod u , operated by bent lever N .

Attached to slides S, S' , are cords c, c , which pass over pulleys T^2 , and S^2 , and have weights W' , attached to their ends. The pulleys S^2 , are hung loosely upon shaft R^2 , which is supported by standards rising from the main frame. They have pawls on their inner faces engaging with ratchet wheels attached to shaft R^2 and so arranged that the pulleys and shaft will rotate together when the cords c , are drawn toward the crank shaft P , and will have a velocity corresponding to that of the slides to which the cords are attached. The shaft R^2 , is rotated by the pulleys S^2 , and carries at its middle, a beveled cog wheel G^2 , which gears into a corresponding wheel G^3 on the top of the shaft of the rotating paster F' , and drives that paster, with a velocity varying with the speed of the slides S, S' . This variation in the speed of the paster, is required in order that the velocity of the paster shall correspond with that of the edge of the paper to which it applies the paste. Otherwise, the paste would be unevenly distributed along the paper, being scanty in some places, and superabundant in others. The shaft of paster F' , is supported by a bracket E^3 , projecting from the bridge E^2 , which is supported at its ends upon the sides of the main frame. The inclined or beveled face of the paster is covered with india rubber, and the paste is supplied to it by a fountain, not shown in the drawings, of the form patented by me 30 Nov. 1858.

From the lower side of the middle at the bridge E^2 , an arm E' , projects downward, and is attached to, and supports the former D' , around which the paper for making the

tubing is to be folded. This former has no other support for its entire length, which extends from the drum C' , at one end of the machine, to the stationary clamps V^2 , near the other. After passing under the rotary paster F' , it passes through the guide G' , which has a collar to receive it, but which does not touch it at any point, ample space being left on every side for the easy passage of the paper of the tubing between the collar and the former. The inner end of the former has a large oblong opening in it, in which the slide Q^2 , plays longitudinally, (see cross section Fig. 3), said slide having V-shaped grooves in its sides, to receive the correspondingly shaped inner edges of the former, as shown in Fig. 3. The inner end of the former is beveled off to correspond with the cut of the knife M' . On the upper side of the former are grooves in which run wires b, b , which are attached to the slide Q^2 . These wires are attached by an elastic strap, or band, a , to the outer end of the former. The office of the elastic strap is to draw the slide Q^2 , toward the guide G' . The upper and under surfaces of slide Q^2 are covered with corrugated india rubber.

Below the former D' , is a board D^2 , to support the paper as it passes from the drum C' . It is attached to, and supported by, the cross piece h , and extends inward as far as the rotating paster F' , where it ceases to be required.

The drum C' , is attached to a shaft g which turns in open bearings in the upper ends of curved arms of the main frame. It is of the same width as the former, and consequently of the same width as the bags made by the machine, and it is, for that reason, made easily removable, so that one of a different width may be substituted, when the width of the former and bag are to be altered.

A^2 marks the standards which, rising from the main frame, support the paper shaft A' , on which the roll of paper, from which the bags are made, is held and rotates. This shaft rests at one end in an adjustable bearing d , which slides on guides f , and is adjusted by screw e . The object of this arrangement is to adjust the roll of paper laterally at will. From the standards A^2 project upward the curved arms A^3 to which at i, i , the swinging arms j, j , are pivoted, which carry between them, at their lower ends, the pendent roller B^2 . The office of this roller is to rest upon the top of the paper as it passes from the roll to the drum C' , and diminish the effect of any changes of velocity in the action of the machine, which might have a tendency to strain or break the paper.

The folder and paster H' , is a box in the shape of half a wedge. One side of it is vertical, and projects below the others in

the shape of a knife edge or striker. The inclined side of the box has a slot-like opening in the bottom, which is controlled by a sliding gate *s*, kept down by spring 3, and opened, when required, by the operation of lever 1, upon projection 2, lever 1 being operated by contact with the lower end of screw 4, when the box *H'*, is at its highest point. The screw 4, is supported by the gallows *I'*. The box *H'*, is filled with paste, and is kept supplied by a fountain or reservoir, not shown, of the usual form. When it rises, so that lever 1, comes in contact with the screw 4, a small portion of the paste escapes, and covers the knife edge. When it descends, the knife edge passes in between the pair of folding rollers *L'*, and imparts its paste to any paper that may be introduced between them. The handle *J'*, of the paster and folder, passes through a sleeve attached to the top rod of frame *K'*, and is adjustable by means of a set screw in said sleeve. The frame *K'*, works vertically in sleeves attached to the sides of the main frame. It has a lower, adjustable, transverse rod *p*, which is embraced by the fork of lever *M*, as before noticed. Its ends are held in forks projecting from sleeves *o*, which are attached to the vertical rods of frame *K'* by set screws, so that the position of rod *p*, can be changed at pleasure.

The operation of the machine is as follows: The paper from which the bags are to be made is placed in a large roll on the shaft *A'*. Its free end is passed under roller *B*², over drum *C'* and under the former *D'* around which the paper is folded so that its edges come together and lap at about the middle line of the upper side of the former. By passing around the drum, which is of the same width as the former, the paper is prepared to fold kindly in the manner desired. Its overlapping edge passes over the beveled edge of the paster wheel *F'* and receives a supply of paste, when the paper proceeds under and through guide *G'* and becomes a tube by the adhesion of its edges. It is here seized by the first pair of clamps *V*. These clamps when at the nearest point to *G'* begin to close by reason of the dart *W*² having removed the dog *l* which held them open and as the slide *S* begins its return motion, the clamps come gradually into contact by sliding on the inclined faces of the dart. This arrangement causes the clamps to close upon the paper while moving in the same direction that they are to draw it, thus avoiding undue strain if not actual rupture. At the point where the tube of paper is seized by the clamps the slide *Q*² is within the tube, and thus the paper is tightly held between the clamps and the slide *Q*² and is drawn toward the knife end of the former without any serious resistance from friction. While it is being thus drawn toward the

end of the former by the first pair of clamps *V*, the second pair *V'* is moving toward the guide *G'* to be ready to seize the paper when it is released by the first pair. The open clamps *V'* pass over the closed clamps at each stroke, one jaw being above and the other below them. When the first pair has drawn the tube toward the knife end of the former to the end of its stroke, its jaws are opened by a sharp dart *W*, as before described, and it commences its return toward guide *G'* for a repetition of the operation. Thus the paper tubing is continuously drawn toward the knife by the clamps, by what may not inaptly be termed a hand-over-hand motion. When its end arrives at the folding rollers *L'*, it is held to the end of the former by the stationary clamp *V*², while the knife *M'* rises and by an oblique stroke severs from the tube a piece of the proper length for a single bag. When the beveled end of the tube rests upon the folding rollers *L'*, the folder and paster *H'* descends and forces the end of the bag between the rollers *L'*, at the same time imparting the required amount of paste to the flap, which, in passing through the rollers is turned over and pasted and closes the end of the bag. The bag, thus finished, passes through the rollers *L'* and falls into a suitable receptacle.

This machine, it will be observed is provided with every adjustment necessary to enable it to make bags of every variety of size within the extremes of its capacity. The former can be replaced by one of a different width, and a corresponding change can be made in the drum. The throw of the crank can be diminished and the connecting rods shortened so as to shorten the stroke of the clamps and lessen the length of the bags. The darts can be adjusted in their sleeves to any change in the stroke of the slides, and the paster and folder *H'* is capable of the nicest adaptation to the width of the flap it is required to act upon.

I have contemplated, in some cases, locating the paster in such a position as to apply the paste to the edge of the paper while in the roll on the paper shaft. The advantage of thus locating it is that there is great certainty of applying the paste in exactly the right place. However much the paper may move to the right or left in unwinding, the paster will move with it, and no imperfect work will result from this variation in the position of the paper. I mention this as a modification which I have contemplated, and not as, in my judgment, the best arrangement, that being hereinbefore described and shown. I have also contemplated the use of more than one former at the same time.

One of the principal advantages of the method of drawing the paper by means of the reciprocating clamps over the use of

rollers for the same purpose, is that the paper will always work straight through the machine, however uneven the paper may be; whereas in the roller machines, uneven paper is very unmanageable, and, if run through, it makes bad work and much waste of material.

Having thus fully described my improvements, I wish it understood that I do not claim the former in this application, that part of the machine having been secured to me in my patent of 1st May 1855, reissued 26th April 1859; but

What I do claim and desire to secure by Letters Patent is—

1. Locating the rotating paster F' so as to apply the paste directly to the edge of the paper in forming the tube as set forth.

2. Giving to the paster F' a velocity corresponding with that of the edge of the paper on which it applies the paste, by means of the ratchet arrangement operated as described and for the purpose stated.

3. The slide Q² constructed and operating substantially as and for the purpose specified.

4. Feeding the tube of paper to the knife

by the alternating operation of the reciprocating clamps V, V', as specified.

5. The clamps V, V', V² constructed as set forth, and operating them by darts and dogs as described.

6. The folder and paster H' constructed and operating substantially in the manner stated.

7. In combination with paper bag machinery, attaching the connecting rods which operate the slides and clamps to opposite crank centers to secure a continuous feed of the tubing to the knife as described and shown.

8. The general arrangement of the parts of the machine hereinbefore described for performing the various operations of making the bags in the order and manner set forth and shown.

The above specification signed and witnessed this eleventh day of February A. D. 1860.

S. E. PETTEE.

Witnesses:

JOHN H. LEWARZ,
C. E. SPANGLER.