3 Sheets—Sheet 1.

C. H. MALTBY & G. W. MARTIN.

Paper-Bag Machine.

No. 212,245. **Patented Feb. 11, 1879.**

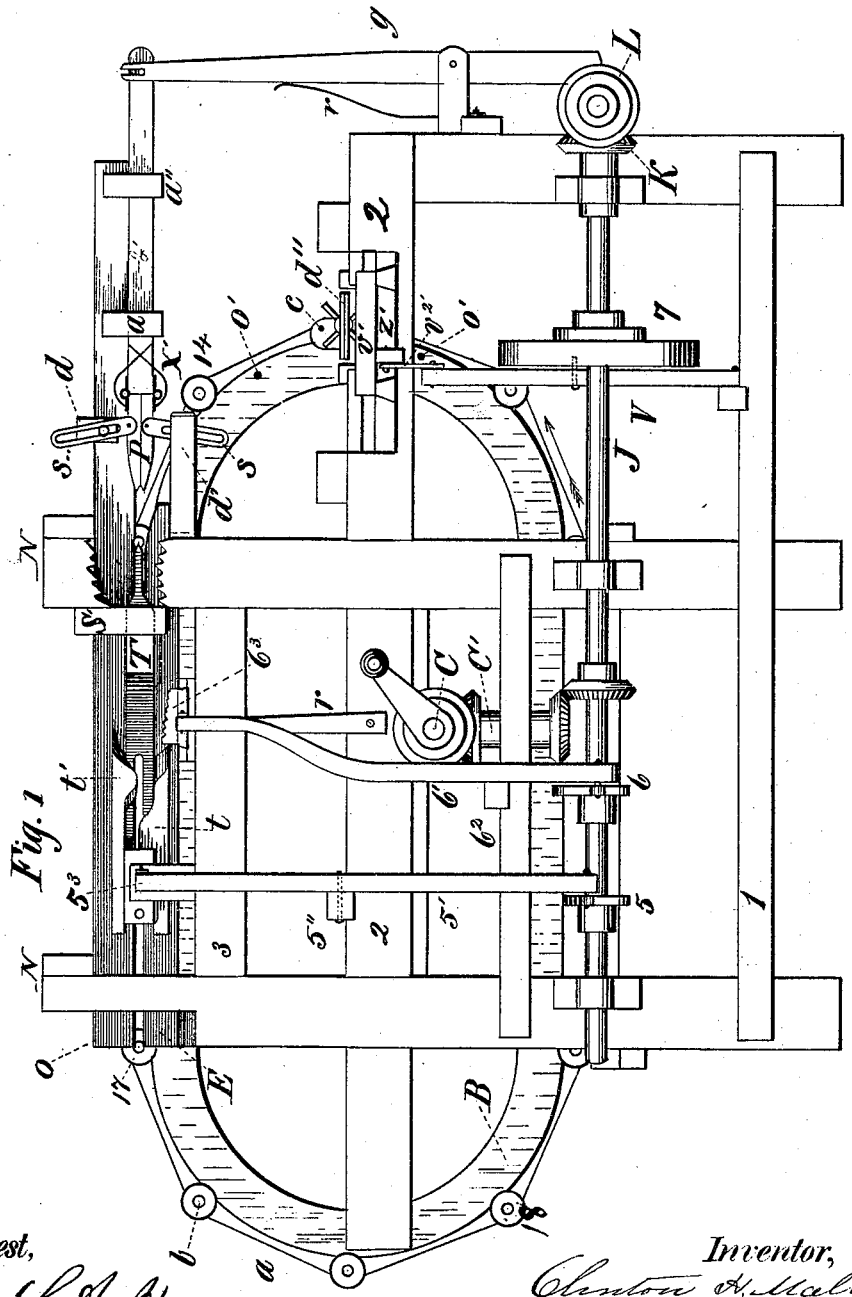


Fig. 1

Attest,

S. A. Wagenman
H. S. Greaves

Inventor,

Clinton H. Maltby
George W. Martin
By H. P. K. Peck & Atty.

3 Sheets—Sheet 2,

C. H. MALTBY & G. W. MARTIN.

Paper-Bag Machine.

No. 212,245. Patented Feb. 11, 1879.

Fig. 4

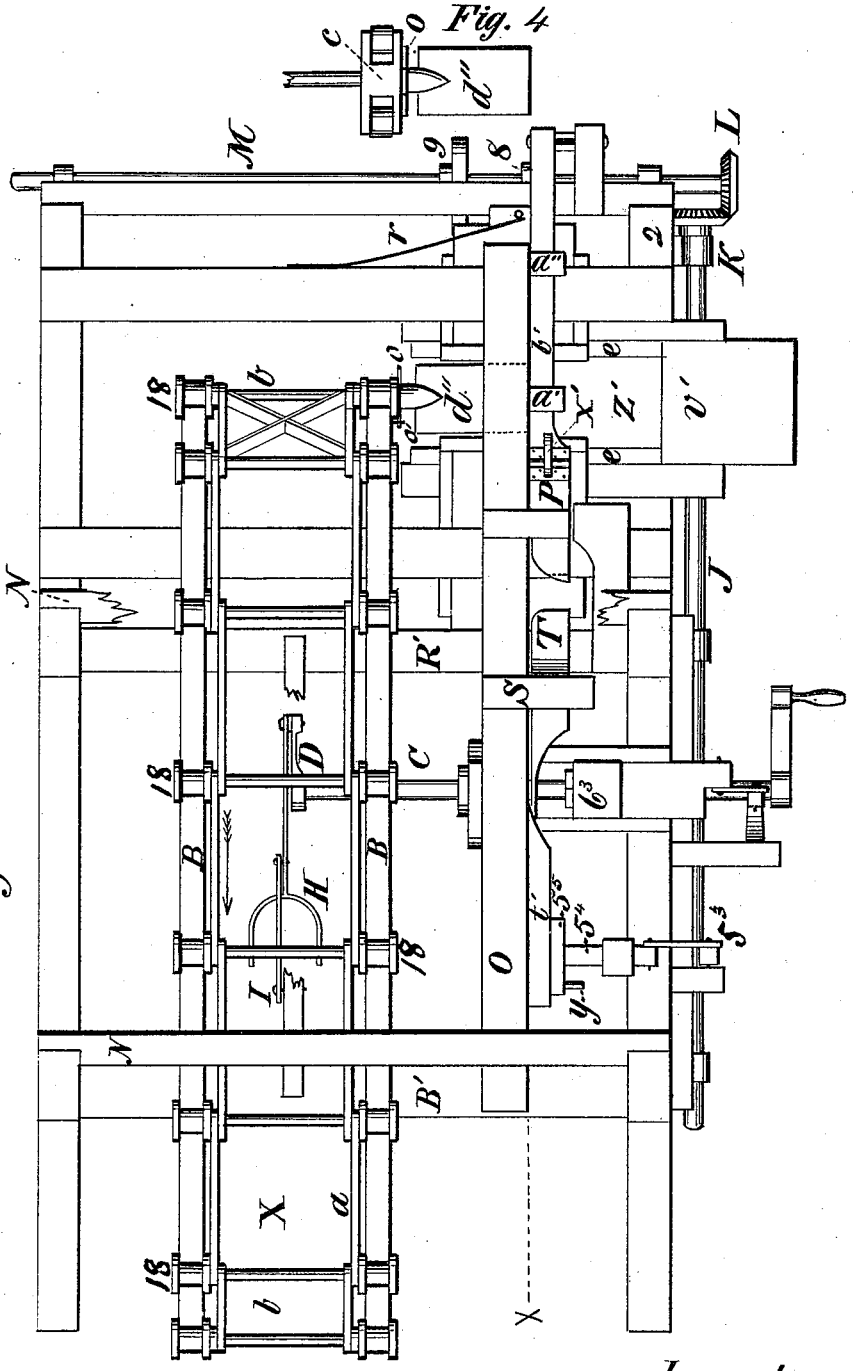


Fig. 2

Attest.
S. A. Hagaman
H. S. Greaves

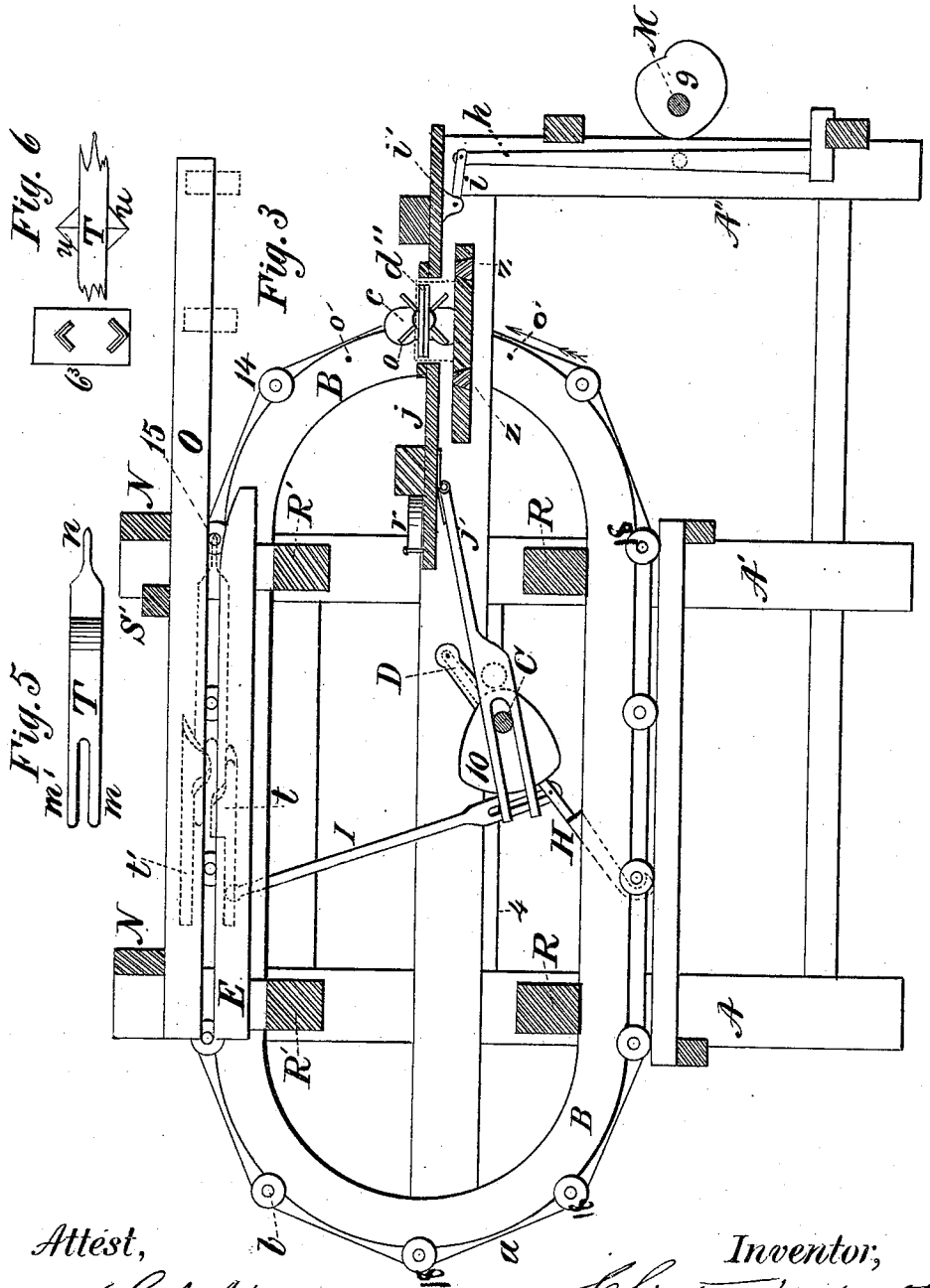
Inventor.
Clinton H. Maltby
George W. Martin
By A. P. K. Peck Atty.

3 Sheets—Sheet 3.

C. H. MALTBY & G. W. MARTIN.

Paper-Bag Machine.

No. 212,245. Patented Feb. 11, 1879.



Attest,

S. A. Hageman

H. C. Dreaver

Inventor,

Clinton H. Maltby

George W. Martin

By H. B. K. Peck Atty

UNITED STATES PATENT OFFICE.

CLINTON H. MALTBY AND GEORGE W. MARTIN, OF DAYTON, ASSIGNORS OF ONE-HALF THEIR RIGHT TO ROBERT E. JOHNSTON, OF MIDDLETOWN, OHIO.

IMPROVEMENT IN PAPER-BAG MACHINES.

Specification forming part of Letters Patent No. **212,245**, dated February 11, 1879; application filed June 14, 1878.

To all whom it may concern:

Be it known that we, CLINTON H. MALTBY and GEORGE W. MARTIN, of Dayton, Ohio, have invented a new and useful Improvement in Machines for Making Paper Bags, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Figure 1 represents a front-side elevation of our machine. Fig. 2 represents a plan or top view of the same. Fig. 3 represents a vertical section taken at line *x* of Fig. 2. Fig. 4 represents the bag-former and its connections. Fig. 5 represents a front view of one of the guides for the bottom of the bag. Fig. 6 represents a portion of the same, with the projecting corners of the bag-bottom and the inner face of the paste-box.

The object of our invention is to form paper bags, known as "satchel-bottom bags," from rectangular sheets of paper by machinery; and consists in certain devices and their combinations by which the various operations for forming the body and the bottoms of the bag are performed, as hereinafter described.

The frame of the machine consists of three pairs of posts, suitably connected by ties and beams, as represented in the drawings. Within the frame two endless rails or ways, B, are secured around the four cross-beams R R′, and form the track upon which the endless carrier X, consisting of links *a*, pivot-rods *b*, and trucks *e*, travel. One or both ends of the several pivot-rods *b* may be furnished with trucks *c* and plates or formers *d″*, as shown in detached Fig. 4. The main shaft C is supported in bearings secured to the frame-ties 2 and 4, and carries a crank-arm, D, on its inner end, which terminates at the central longitudinal plane of the endless carrier X.

To the crank-arm D the dog-hook H is pivoted, and the latter is also pivoted with the slot in the pendent swinging bar I, by which means the reciprocating movement of dog-hook H is governed, and made to cause the endless carrier X to travel upon the endless track with a regular intermittent movement. The outer end of shaft C is provided with a bevel-gear, that meshes into a corresponding bevel-gear on vertical shaft C′, having a bevel-gear meshing with its counterpart upon line-shaft J, secured in bearings upon the front of the frame. Line-shaft J is furnished with cams 5, 6, and 7, and with bevel-gear K, which meshes with its corresponding gear L upon the counter-shaft M, across the end of the machine. Shaft M is furnished with cams 8 and 9.

To the under side of the cross-pieces N N the rectangular plate or beam O is secured, and furnished with supports *a′ a″* for the shank *b′* of reciprocating forceps P, the jaws of which are hinged, and retained by springs X′.

Two projecting arms, *d d′*, attached to the frame and beam O, are provided with pins, which project through slots made in the flat metal links S, pivoted respectively to the jaws of forceps P, as represented in Fig. 1.

The springs X′ and links S serve to govern the operations of the forceps while the bag-bottom is being formed.

Upon the cross-ties R′, under and parallel with plate O, the guide-plate E is secured; and between the two latter there is an open slot or way, of sufficient width to permit the former *d″* to pass with the bag upon it.

The bracket S′, projecting from plate O, secures the guide T in front of the opening or slot between parts O E.

There is a narrow space between guide T and the front of plates O E, sufficient for the partly-formed bag-bottom to pass along as it is carried upon former *d″*.

Guide T has a horizontal tongue, *n*, with wedge-shaped point or end at its right hand termination, curved at its inner corner, and is bifurcated at its opposite end, forming flattened prongs *m m′*. There are two guides, *t t′*, (shown in dotted lines in Fig. 3,) formed with beveled curves upon their inner surfaces, which serve to turn successively the two projecting carriers of the bottom of the bag over the respective prongs *m m′* of guide T during the progress of the bag through the slots between the parts O, E, and T, and behind the guides *t t′*.

While the body of the bag is carried upon

former d'' between plates O E, the projecting end thereof is acted upon by the forceps P, guide T, and guides or folders $t\ t'$, to make the bottom.

Cam 5 operates lever 5′, having its fulcrum-pin in arm 5″, its upper end being connected by pivoted link 5^3 to the arm 5^4 of the pressing-block 5^5, which may be made hollow, to be heated by steam through pipe y.

Cam 6 operates lever 6^1, fulcrumed at 6^2, its upper end being connected by a pivoted link to the paste-box 6^3, which is provided with two V-shaped openings, having lips, as shown in detached Fig. 6, through which paste is forced by its own gravity.

The relation of the V-shaped paster-lips to the guide T and to the two unfolded corners of the bottom of the bag (denoted by letters $u\ u$) is shown in Fig. 6, the paster-box 6^3 being reversed in position to show the lips.

Cam 7 is provided with a groove, in which a pin projecting from lever v works to actuate the reciprocating table V′, to which it is connected by a pivoted link, V″, under it. Table V′ is supported upon two arms, $e\ e$, running in ways Z Z; and a portion of the front frame-timbers, 2, is cut away for the table, as seen in Fig. 1.

A stationary table, Z′, occupies a position between arms $e\ e$, and below the plane of reciprocating table V′.

Cam 8 operates the reciprocating forceps P by means of lever g. (Shown in Fig. 1.)

Cam 9 actuates lever h, connected by link i to the reciprocating folding-plate i', suitably supported in ways; and cam 10 actuates the corresponding folding-plate j through forked lever j', which is hinged to said plate j, as seen in Fig. 3.

The former d'' has attached to its shank a disk with four radiating arms, o, which, by contact with studs o' upon the side of track B, turn former d'', with its axle-pivot b, (as the endless carrier travels,) into proper positions to receive the paper as it is fed from tables V′ and Z′, and that it may enter edgewise with the bag (in tubular form) between the plates O E. The several levers which are not worked by grooved cams are thrown back by retracting-springs, as shown at $r\ r$.

Each end of the several pivot-rods b may be provided with a truck, c, radiating arms o, and former d''; and the machine may be furnished with several series of the devices described for forming the bag, so that two or more bags can be completed at the same time.

It will be apparent from the foregoing description that during a partial revolution of shaft C the operation of dog-hook H, acting upon a pivot-rod, b, moves the carrier X equal to the distance between the pivot-rods b, and that the carrier then rests, and the several cams upon shafts C, J, and M actuate the bag-forming devices during the remaining part of the revolution of said shaft. During the latter half of the revolution of shaft C, crank D will, by the aid of slotted pendant I, throw the dog H rearward to again grasp the next succeeding pivot-rod, ready to move the carrier in like manner; and these operations are continually repeated with regular intermissions, as hereinafter specified.

Before one of the formers d'' rises to the horizontal position, as shown in Figs. 1, 2, and 3, the paper-feeding table will have moved forward a paper blank for a bag on table Z′, which blank will have had paste applied to it near its edge. The blank may be drawn forward by forceps, to be attached to the machine for the purpose. When former d'' rises to said position the blank will be carried upward upon it; and while the former rests in the position as shown, the blank upon it will occupy the position shown in dotted lines in Fig. 3, and folder j will be thrust under the former, forcing the left-hand edge or portion of the blank under, which has the paste upon its outer surface, and then folder i', from the other side, will thrust the right hand (vertical portion) of the blank under the former d'', also causing it to lap upon the pasted edge that had been forced under by folder j, thus forming a tube around the former d'', with its outward open end projecting beyond the outer creased end of the former.

At this stage of the work the carrier X moves forward another degree in its progress, when the next former of the series to be used receives its blank in like manner, the preceding former d'', with its paper tube, being meantime at rest at the point 14. The third movement of carrier X will bring former d'', with its tube or partially-formed bag, to the position indicated by 15; and while arriving at said position the wedge-shaped end n of guide T will force inward one side of the projecting open end of the paper tube, and while at rest the closed jaws of forceps P will be thrust forward and strike the opposite side of the projecting end of the bag and fold it also inward. Then the jaws of the forceps will be suddenly opened by the aid of slotted links S, thereby spreading out the upper and lower portions of the projecting end of the bag against the fronts of plates O and E, respectively. As the forceps P are thrust forward, after forcing inwardly the side of the end of the tube, with their inner rounded corners, the jaws will meet the end of wedge n, which will enter the gap at their outer corner, between them, partially opening them before links S begin to act upon them.

The next stage or movement of carrier X will cause the former d'', as it passes with its bag between plates O E, to convey the bag-bottom behind guide T, with its upper and lower corners projecting, as seen in Fig. 6; and while the carrier X rests in its course again with the former d'' in range with paster-box 6^3, the cam 6 will actuate its lever and move the paster inwardly, causing its V-shaped opening and lips to deposit paste upon the two corners $u\ u$ of the bag-bottom, which project respectively above and below the guide T.

The next movement of carrier X and former d'' passes the bag-bottom opposite to drier 5^5, and in its passage the beveled curve upon the inner face of guide t' will cause the upper projecting corner of the bag-bottom to be folded downward over prong m', Fig. 5, of the guide T; and the paste deposited upon it will cause it to adhere to the center of the bag-bottom, which is exposed between prongs $m\ m'$ of guide T, and in like manner, as the bag is carried forward, guide or folder t will fold the lower projecting corner of the bottom upward and against the bottom of the bag, thus completing the work of folding the pasted parts.

While the former d'' rests in range with the pressing-block or drier 5^5, the latter is thrust forward by its lever and cam, and made to press and dry the finished bag-bottom.

The bag being completed, the next movement will carry the former d'', with the bag upon it, to the position indicated by 17, when they rest for the removal of the bag, which will be done by a suitable mechanism, to be described in a subsequent application for Letters Patent; and in said application the mechanism for feeding the paper from a roll to the machine will also be described.

When as many formers d'' as there are pivot-rods b are used, each of the several necessary operations to complete a bag will be performed during each revolution of shaft C.

Opposite to the point indicated by 15, and set in recesses formed in faces of plates O E, we shall employ two clamping-pieces, of wood or metal, with springs to hold them against the paper tube on the former d''. These spring-pieces will have their faces flush with the fronts and the inner corners of plates O E, respectively. Their right-hand ends will be chamfered to admit the former d'' between them. The object of these spring-pieces or jaws will be to hold the paper tube on former d'' so that wedge n and forceps P shall fold the bottom accurately. This mechanism will be more fully described in the specification of our subsequent application.

The paper may be cut into rectangular sheets of the proper size for the bag, and, being placed on table V' one sheet at a time, may be fed forward onto table Z', where it will be pushed forward by table V'. But we propose, instead of the tables V' Z', to use a mechanism for feeding the paper from a roll, and this mechanism for feeding the paper from a roll embraces a pasting apparatus, feeding clamps or frames, and shears to be operated by the same power which drives the bag-machine.

As before intimated, the mechanism represented in Fig. 4 will be employed instead of the friction-rolls 18, where they appear as mere guides on track B.

We claim as our invention—

1. The pivoted intermittently-revolving former d'', operating substantially as and for the purpose herein specified.

2. The former d'' and arms o, in combination with carrier X, ways B, and studs o', as and for the purpose specified.

3. The former d'' and carrier of a paper-bag machine, in combination with plates O and E, and guides T, t, and t', substantially as and for the purpose specified.

4. In a paper-bag machine, the reciprocating forceps P, in combination with former d'' and guide T, substantially as and for the purpose described.

5. In a paper-bag-machine, the reciprocating paster 6^3, in combination with bifurcated guide T, substantially as and for the purpose specified.

In testimony hereof we have hereunto subscribed our names this 18th day of May, A. D. 1878.

CLINTON H. MALTBY.
GEORGE W. MARTIN.

Witnesses:
WILLIAM B. IDDINGS,
DANIEL W. IDDINGS.