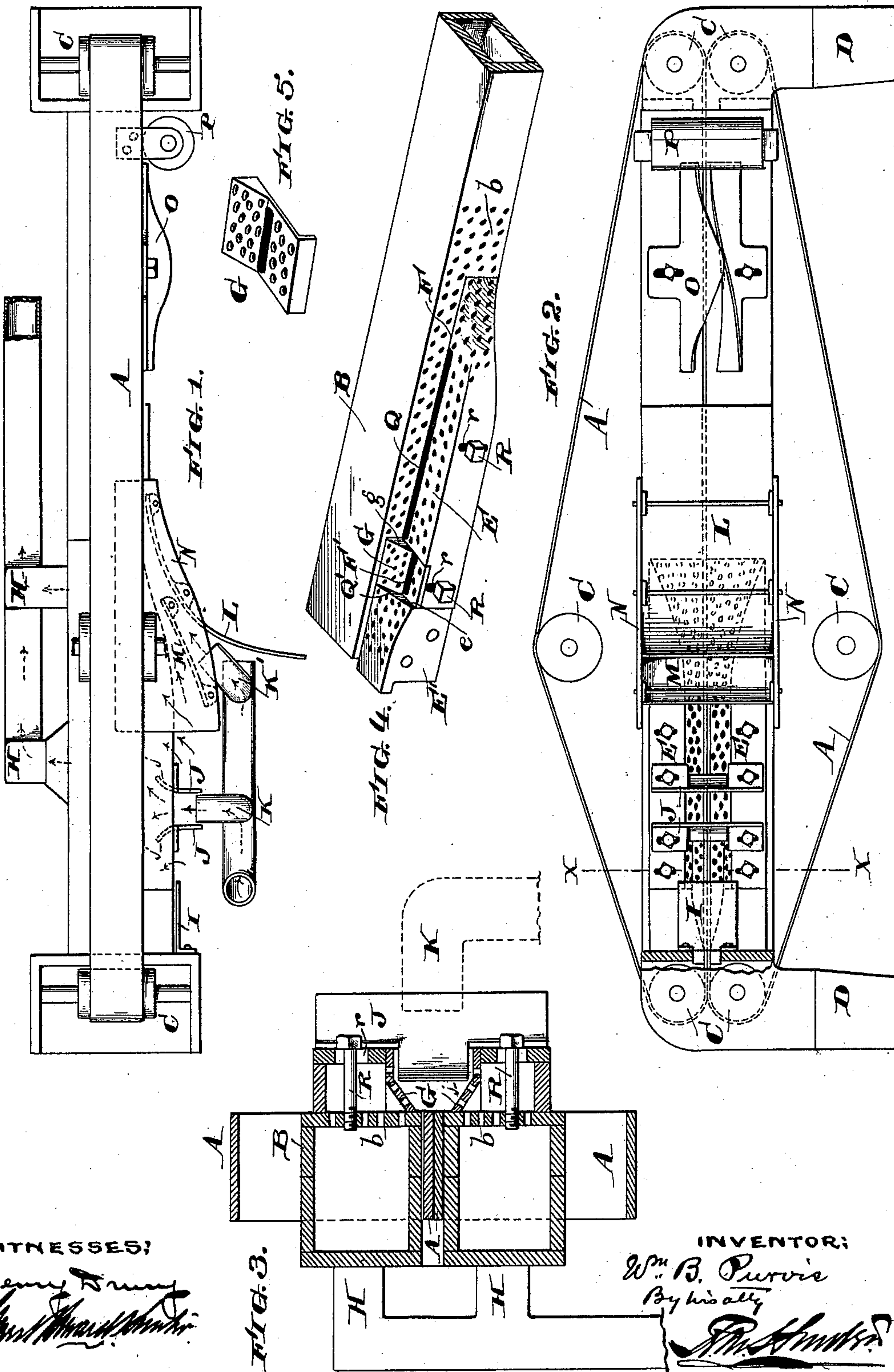


(No Model.)

W. B. PURVIS.
PAPER BAG MACHINE.

No. 434,461.

Patented Aug. 19, 1890.



WITNESSES:

Henry D. ...
...

FIG. 3.

INVENTOR:

Wm. B. Purvis
By his atty

...

UNITED STATES PATENT OFFICE.

WILLIAM B. PURVIS, OF PHILADELPHIA, PENNSYLVANIA.

PAPER-BAG MACHINE.

SPECIFICATION forming part of Letters Patent No. 434,461, dated August 19, 1890.

Application filed February 4, 1890. Serial No. 339,159. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM B. PURVIS, of the city and county of Philadelphia, and State of Pennsylvania, have invented an Improvement in Paper-Bag Machines, of which the following is a specification.

My invention has reference to paper-bag machines; and it consists of certain improvements, which are fully set forth in the following specification, and shown in the accompanying drawings, which form a part hereof.

More particularly my invention relates to machines for forming a satchel square bottom upon a bellows side-fold tube, and is an improvement upon the apparatus disclosed in my application, Serial No. 295,971, filed January 10, 1889, in which are shown suction-formers provided with longitudinal depressions or grooves for drawing out the paper fed between the suction-formers and forming it into a square-box shape and then drawing it out and folding it into the satchel square bottom.

My invention relates more specifically to certain improvements in the construction of the formers and in the devices for controlling and guiding the air-currents to the formers. In this improvement, in addition to the suction for forming the ends of the tube, I employ air-blasts guided by means of certain hoods and air-guides, so as to assist the action of the formers in shaping the ends of the tube into the proper shape, and I modify the shape of the formers so as to more positively accomplish the breaking down of the tube into the box shape.

My invention also relates to improvements in construction of the formers whereby they may be adjusted to suit different sizes of bags, so that upon the same machine there may be made a variety of sizes of bags.

In the drawings, Figure 1 is a plan view of my improved apparatus. Fig. 2 is a side elevation of the same. Fig. 3 is a cross-sectional view, upon an enlarged scale, on line *x x* of Fig. 2. Fig. 4 is a perspective view of one of the detached formers; and Fig. 5 is a perspective view of a detached portion of the former.

A A are endless carriers or aprons for conducting the paper tubes between the formers B.

C C are suitable guiding and feeding rollers

for guiding and feeding the aprons A A with their adjacent faces in contact between the formers B B. These guiding and feeding rollers are mounted in any convenient manner upon the main frame of the machine D.

The formers B are constructed of a hollow box shape having a flat vertical perforated face *b* and a laterally-projecting perforated portion, forming with the flat perforated surface *b* a longitudinal groove or depression F. One end of this laterally-projecting portion is curved or tapering to the flat surface *b*. This laterally-projecting portion is preferably made in sections E E', the upper section E' having its horizontal perforated surface arranged near the upper edge of the flat surface *b* and slightly curved. It is preferably made integral with the flat surface *b* or fixedly secured to it. The second section E, the upper surface of which is in a lower horizontal plane than the perforated surface of the portion E', so as to form therewith a break or step *e*, is secured to the box portion B by means of bolts R through slots *r*, so that this section may be raised or lowered so as to expose a greater or less amount of the flat surface *b* and to increase or diminish the distance of the transverse groove F from the upper edge or top of the box-shaped former B to suit different sizes of bags. The upper end of the surface of this adjustable section is provided with a small inclined perforated piece G, which is arranged immediately adjacent to the section E', inclining to the horizontal perforated surface of the section E and forming therewith a short longitudinal groove or depression F'. This inclined portion G forms with the horizontal perforated surface of the section E' at its side a second smaller triangular step *g*. The upper portion of the perforated surface of the adjustable section E, including the triangular or inclining piece G, may be made separate and detachable from the adjustable section E, as illustrated in Fig. 5. The two formers are arranged opposite to each other and separated a slight distance, as illustrated in Figs. 2 and 3, with the endless bands or carriers C running between their flat unperforated faces. H are suction tubes or pipes connecting with the interiors of the box-shaped formers

B B and connecting with suitable suction-creating devices.

I is a small hood or covering arranged over the space between the upper portions of the
5 formers or sections E'.

J J are two air-guides, forming an air-funnel, arranged across the faces of the formers B B a short distance from the end of the hood or covering I and having projecting portions
10 j, extending inward between the adjacent horizontal portions of the formers and slightly curved inward, so as to guide the air-currents in opposite directions, or away from each other, as indicated by the arrows.

15 K is an air-blast pipe opening into the funnel formed by the air-guides J J.

L is an enveloping hood extending upward from the ends of the formers and curving outwardly.

20 M is a second hood or guide arranged adjacent to and behind the hood L, leaving a passage between it and the hood L.

K' is a blast pipe or tube opening between the hood or guides M and L for introducing
25 a blast of air between them toward the ends of the suction-formers. These hoods L and M may be supported in suitable frames N N upon the formers B or the main frame of the machine.

30 O is a folder, and P the flattening-roller for flattening down the folded bags. The ends of the bags may be pasted before they are flattened and folded in the usual manner.

The guides J J, forming the air-funnel, are
35 preferably secured to the horizontal portions of the formers by means of slotted ears, so as to admit of the adjustment of these horizontal portions, as heretofore described.

I find it expedient to make an opening or
40 slot Q in the groove F between the horizontal and vertical portions of the formers to increase the suction at these points and more perfectly to break down the end of the tube into the square-box shape. A similar slot
45 Q' may also be formed in the groove or depression F' between the inclined piece G and the adjacent flat horizontal surface of the piece E'.

The various steps in the formation of the
50 bag are similar to those set out in my application heretofore referred to, the improved construction of the present application being intended to more perfectly perform these steps. The bellows side-fold tube is conducted between the adjacent surface of the
55 carriers A A with its end projecting between the perforated faces of the formers B B. As this end passes between the horizontal perforated face of the portion E', the two sides of
60 the paper are drawn apart by the suction against the inclined perforated surfaces, and as the bag is conducted onward the ends are drawn down upon the triangular pieces G, the grooves F' between these triangular
65 pieces and the horizontal surface of the portion E forming a crease, the formation of which is assisted by the greater suction of

air through the slot or opening Q'. As the bag passes onward from the triangular pieces G, it is drawn into the box shape between the
70 vertical and horizontal faces b and E, and as it continues to traverse through the formers the ends are drawn out against the tapering ends of the formers, and thence pass to the pasting and folding devices. The dropping or springing of the paper from the faces
75 of the sections E' to the inclined piece G and again to the flat horizontal surface of the section E down the steps g and e, respectively, assists in more perfectly breaking the tube
80 into the box shape, and the openings or slots Q' and Q in the grooves or depressions F' and F more perfectly form the crease of the box shape.

The hood I over the upper part of the opening
85 between the formers prevents the air entering at that point and causes the air-currents to rush in, as indicated by the arrows. The air-currents striking against the inside of the bag assist in opening it. The air-blast,
90 entering through the funnel or air-guides J J and being guided in opposite directions, enters into the box-shape opening in the end of the bag and tends more perfectly to force the paper against the perforated surface and into
95 the grooves or depressions F and F'. The air-blast from the pipe K', entering between the hoods or guides M and L, (which also constitute an air-funnel,) acts upon the sides of
100 the bag and assists the formers in drawing them into diamond shape, which is the final step of the formers to the bottom of the bag before pasting and folding.

If desired, the pipes K K' may be connected with the pressure side of the suction-creating devices by which a suction is created
105 through the pipes H H.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—
110

1. In a paper-bag machine, the combination of two suction-formers having perforated surfaces, between which the ends of the paper tube are fed, and provided with two independent grooves arranged at different
115 portions of the length of the formers and out of line with each other.

2. In a paper-bag machine, the combination of two suction-formers, each having a perforated surface over which the paper is
120 passed, formed with two or more steps, in moving over which the paper is caused to abruptly open.

3. In a paper-bag machine, the combination of two suction-formers, each having a vertical perforated face and a horizontal perforated section vertically adjustable with reference to said vertical perforated face.
125

4. In a paper-bag machine, the combination of two suction-formers, each consisting of a
130 vertical perforated portion and a horizontal perforated portion made in sections, one of said sections being vertically adjustable relatively to the vertical portion.

5. In a paper-bag machine, the combination of two suction-formers, each having vertical and laterally-projecting perforated surfaces, said laterally-projecting perforated surface being made in sections arranged in different planes relatively to one another and forming steps in said laterally-projecting perforated surface.

6. In a paper-bag machine, the combination of two suction-formers, each having a vertical perforated portion, a laterally-projecting perforated portion at the forward end of said vertical portion, and a second laterally-projecting perforated portion arranged adjacent thereto and in a lower plane and having a portion of its surface immediately adjacent to the higher lateral portion inclining upwardly.

7. In a paper-bag machine, the combination of two suction-formers having perforated surfaces, between which the ends of the paper tube are fed, and provided with two independent slotted grooves arranged at different portions of the length of the formers and out of line with each other.

8. In a paper-bag machine, the combination, with two suction-formers having perforated surfaces, between which the ends of the paper tube are fed, of an air-funnel located near the ends of said formers, and an air-blast for blowing air through said funnel.

9. In a paper-bag machine, the combination, with two suction-formers having perfo-

rated surfaces, between which the ends of the paper tube are fed, of an air-funnel located near the center of said formers, and an air-blast for blowing air through said funnel.

10. In a paper-bag machine, the combination, with two suction-formers having perforated surfaces, between which the ends of the paper tube are fed, of a hood or covering over the upper part of said formers, an air-funnel at or about the center thereof, an air-blast pipe opening to said funnel, a hood or cover extending upwardly from the rear ends of said formers, a guide located behind and adjacent to said rear hood, leaving a space between it and said rear hood, and an air-blast pipe opening between said rear hood and adjacent air-guide for introducing an air-blast near the rear ends of said formers to assist the action of the suction thereof.

11. In a paper-bag machine, the combination, with two suction-formers having perforated surfaces, between which the ends of the paper tube are fed, of air-blast pipes for introducing a blast of air to said suction-formers at or about their middle, and also near the ends thereof to assist the suction of the formers in forming bottoms of the tube.

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

WILLIAM B. PURVIS.

Witnesses:

ERNEST HOWARD HUNTER,
A. J. DUNN.