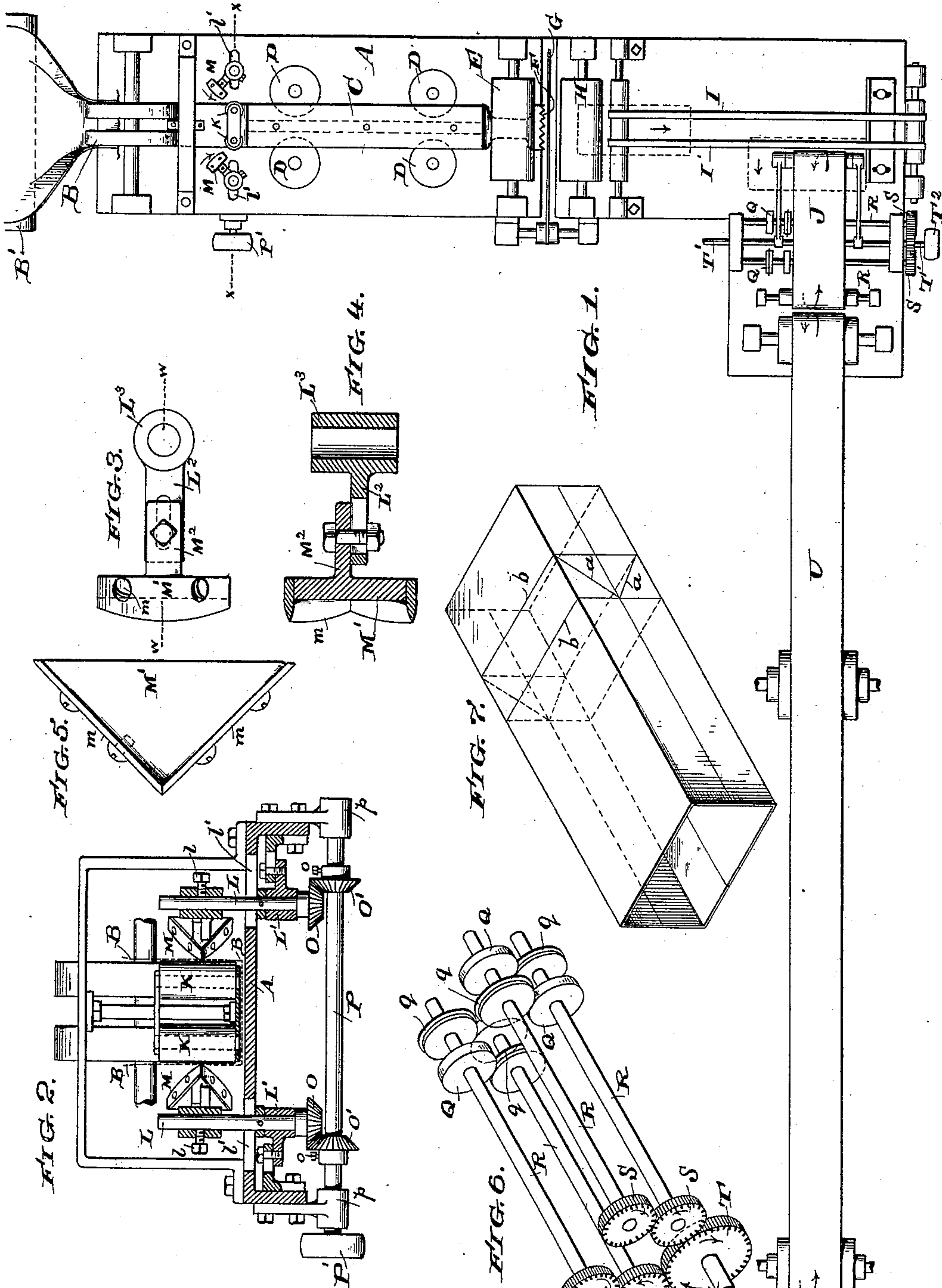


(No Model.)

W. B. PURVIS.
PAPER BAG MACHINE.

No. 435,524.

Patented Sept. 2, 1890.



WITNESSES:

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UNITED STATES PATENT OFFICE.

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PAPER-BAG MACHINE.

SPECIFICATION forming part of Letters Patent No. 435,524, dated September 2, 1890.

Application filed February 4, 1890. Serial No. 339,160. (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 relates 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 thereof.

More particularly, my invention relates to that class of paper bags having an inward or bellows side fold and to the formation of a satchel square bottom upon such a paper bag.

The improvement relates more particularly to the creasing of the paper tube for more effectively forming this satchel square bottom, and is not concerned with the apparatus for forming and folding the bottom upon the creased tube.

In the formation of a satchel square bottom upon a bellows-side-fold tube, the bottom is formed into a square-box shape the sides of which are then drawn out and flattened into an angular shape and folded over one upon the other and pasted. These operations cause the paper of the tube to be folded or creased in certain places.

In my applications, Serial No. 295,971, filed January 10, 1889, and Serial No. 339,159, filed February 4, 1890, I have illustrated suction apparatus for the formation of the satchel square bottoms upon a bellows-side-fold tube. My present improvement relates to the apparatus for forming creases upon the bottom of the tube at those places in which the paper is to be bent or folded during the forming process. It is immaterial to the present invention what specific form of apparatus is employed for the purpose of forming the bellows-side-fold tube independent of the creasing devices.

In the drawings, Figure 1 is a plan view of a paper-bag machine, illustrating the principles of my invention. Fig. 2 is a cross-sectional view of the same, on an enlarged scale, on the line xx of Fig. 1. Fig. 3 is a plan view, on an enlarged scale, of one of the angular creasers detached from the machine. Fig. 4 is a sectional view of the same on the line w of Fig. 3. Fig. 5 is an end elevation of the same. Fig. 6 is a perspective view, upon an

enlarged scale, of the detached transverse creasers; and Fig. 7 is a perspective view of a bellows-side-fold tube, illustrating the position of the creases formed thereon.

A is the main frame of the machine.

B are guiding-rollers mounted upon the frame for guiding the paper from the roll B' to the former C, about which the paper tube is fed and formed into the bellows-side-fold tube by means of the forming-rollers D D in the manner well known in the art.

E is a flattening-roller for flattening the tube.

F is a stationary cutter.

G is a rotating cutter or beater for cutting the bellows-fold tube into the appropriate lengths for the bags.

H is a second flattening or feeding roller for feeding the cut pieces of the tube between the carriers or aprons I I.

J are a pair of carriers or aprons arranged at a right angle to the carriers I I for conducting the paper tubes to the bottom-forming devices.

With these details, as heretofore stated, my present invention is not concerned, and they may be varied as desired.

Located upon the former C are two upright rollers K K, preferably formed of rubber, which constitute a backing support for the sides of the paper while the triangular creases are being formed. L L are suitable upright shafts journaled in brackets L' or otherwise to the main frame A, located upon each side of the rollers K K and carrying the angular creasers M M. These angular creasers consist of a triangular plate M', provided upon two of its edges with curved projecting rims m .

M² is an arm or projection from the triangular plate M', by which the triangular creaser may be detachably connected to a slotted arm L² of a collar L³, carried by the shaft L and held thereto by means of a screw l or otherwise. By this means the triangular creasers M may be removed from the shafts L and replaced by others for different sizes of bags. The ends of the shafts L extending below the base plate or frame A are provided with beveled gears O, meshing with gears O', carried upon a shaft P, journaled in suitable bearings p under the frame A and receiving power from a power-wheel P' or in any other con-

venient manner. The paper fed from the continuous roll B' to the former C is bent by the feeding and guide rollers D and extends upon each side of the rollers K K, so as to be
 5 between those rollers and the triangular creasers M M. It will now be seen that as the shafts L are rotated these creasers M will be brought during a portion of their rotation in contact with the paper supported by the back-
 10 ing-rollers K K and will impart thereto a triangular crease *a*, Fig. 7. It will be seen that as the backing-surface K is circular and the triangular creasers M rotate upon the shafts L the creasing-rims *m* must have a curvature
 15 of the arc of a circle described from the center of rotation of the shaft L, in order that the projecting rims shall at all times press against the surface of the rollers K and properly form the triangular creases *a*. In order to adjust
 20 these creasers for different sizes of bags, the creasers of one size are removed and are replaced by another set having a different curvature and length of the creasing-rims *m*, and the former C is removed and replaced by an-
 25 other former of a different size. This change requires an adjustment of the shafts L, so that the curved rims *m* of the creasers M shall press against the rollers K, carried by the former, throughout their entire length.
 30 In order to accomplish the adjustment of the shafts L, I provide the main frame A with slots *l'* and form the brackets L', supporting these shafts L, adjustable, as shown in Fig. 2. The beveled gears O' are also adjustable upon
 35 the shaft P (being secured thereto by screws *o*) to suit such adjustment as may be made in the shafts L. By these rotating creasers M the triangular creases *a* are formed upon the sides of the tube, which is then formed into
 40 the bellows fold in the well-known manner, cut into the proper lengths by the cutters F and G, and fed to the aprons or carriers J, by which it is conducted to the transverse creasing-rollers Q.
 45 It will be seen that the triangular creasers M, by the rotation of the shaft L, will be brought in contact with the paper at certain intervals, which are regulated according to the lengths of the bag to be formed and of
 50 the feeding speed of the machine.
 Q are the transverse creasing wheels or rollers, so arranged as to form two parallel creases *b b*, Fig. 7, upon the end of the bag. To accomplish this I prefer to employ four pairs of
 55 the creasing rollers or wheels Q, arranged in two sets, with an upper and a lower pair in each set. Two of the rollers in each set are provided with creasing rims or projections *q*, and these creasing rims or projections are ar-
 60 ranged relatively opposite in the different sets—that is to say, if a creasing rim or projection in one set is arranged upon an upper roller the corresponding creasing rim or projection of the other set is arranged upon
 65 a lower roller, so that as the paper tube passes between the two sets of rollers each of the two creases *b b* is formed in two directions,

so as to give the greatest flexibility to the paper at those points. I prefer to arrange these creasing rims or projections in the man-
 70 ner illustrated in Figs. 1 and 6, with one of the creasing rims or projections *q* in each set formed upon one of the upper rollers and the other creasing rim or projection upon the op-
 75 posite lower roller, the relative positions of the creasing-rims upon the second set of rollers being transposed, so that as the paper passes between the first set of rollers one of the crease *b* is formed in one direction and
 80 the other crease in the opposite direction, and as the paper passes between the second set of rollers the directions of these creases are reversed. Each pair of rollers Q is carried upon a shaft R, journaled in the frame of the machine, the shafts being provided with gears
 85 S, geared together in pairs, as shown.

T is a gear-wheel gearing with one of the gears S in each pair or set of gears to impart motion thereto. The gear-wheel T is carried upon a shaft T', receiving power from a driv-
 90 ing-wheel T² in any convenient manner.

U represents one of the carrying-bands for conducting the creased tubes through the suction-formers or other devices that may be employed for the purpose of folding and form-
 95 ing the creased ends into the desired satchel square shape. With this, however, as heretofore stated, the present invention is not concerned, having to do only with the formation of the transverse creases *b b* and the tri-
 100 angular creases *a a* upon the ends of the tube.

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

1. In a paper-bag machine, the combina-
 105 tion, with suitable devices for forming a bellows-side-fold tube, of triangular creasing devices to impart triangular creases to the sides of the tube.

2. In a paper-bag machine, the combina-
 110 tion, with feeding devices for a roll of paper, of a former for forming the paper into a tube, a backing-support for the sides of the paper carried by said former, and a triangular rotating creaser adapted to press against said
 115 backing-support during a portion of its rotation to press the paper against said backing-support and impart to it a triangular crease.

3. In a paper-bag machine, the combina-
 120 tion, with feeding devices for the paper, of a former for forming the paper into a tube, a backing-support for the sides of the paper, a vertical rotating shaft arranged adjacent to said backing-support and adjustable to or
 125 from it, and a triangular creaser carried by said rotating shaft and adapted during a portion of its rotation to press the paper against the backing-support and impart thereto a triangular crease.

4. In a paper-bag machine, the combina-
 130 tion, with feeding devices for the paper, of a former-plate for forming the paper into a tube, a backing-support for the sides of the paper, a vertical rotating shaft arranged ad-

5 jacent to said backing-support, and a triangular creaser carried by said rotating shaft and adapted during a portion of its rotation to press the paper against the backing-support and impart thereto a triangular crease, said triangular creaser being detachably connected to said rotating shaft, whereby said creasers may be changed for different sizes of bags.

10 5. In a paper-bag machine, the combination, with suitable devices for forming a paper tube, of a backing-support and a triangular creaser, between which the sides of the paper tube are fed, one of said parts being
15 adapted to rotate to press the paper against the other and form thereon a triangular crease.

20 6. In a paper-bag machine, the combination, with the main frame, of a former carried thereby for forming the paper into a tube, feeding and guiding rollers to feed the paper under said former with its sides extending upward on each side thereof, upright rollers carried by said former, vertical shafts jour-
25 naled adjacent to said upright rollers, triangular creasers carried by said shafts and adapted to move in contact with said upright rollers, and means to adjust said shafts to or from said rollers.

30 7. In a paper-bag machine, the combination, with the main frame, of a former carried thereby for forming the paper into a tube, feeding and guiding rollers to feed the paper under said former with its sides extending
35 upward on each side thereof, upright rollers carried by said former, vertical shafts journaled adjacent to said upright rollers, triangular creasers carried by said shafts and adapted to move in contact with said upright
40 rollers, adjustable journals for said shaft-gears carried by said shafts, a power-shaft, and adjustable gears carried by said power-shaft and gearing with the gears of said vertical shafts.

8. In a paper-bag machine, the combination of suitable devices for forming a bellows-
45 side-fold tube, feeding devices to feed the tube longitudinally, a cutter to cut the tube into lengths, creasing-rollers rotating in a direction transversely to the longitudinal feed-
50 ing motion of the machine, and a feeding carrier or apron to carry cut lengths to the creasing-rollers, whereby the cut lengths of the tube are fed in a transverse direction between the creasing-rollers and their ends are
55 creased transversely.

9. In a paper-bag machine, the combination of suitable devices for forming a bellows-
side-fold tube, feeding devices to feed the tube longitudinally, a cutter to cut the tube
60 into lengths, two sets of parallel creasing-rollers rotating in a direction transversely to the longitudinal feeding motion of the machine, and a feeding carrier or apron to carry
65 cut lengths to the creasing-rollers, whereby the cut lengths of the tube are fed in a transverse direction between the creasing-rollers and their ends are creased transversely with two parallel creases.

10. In a paper-bag machine, the combination, with suitable devices for forming a bellows-
70 side-fold tube of paper, of two pairs of creasing-rollers, between which the paper tube is fed for creasing the ends of said tube transversely with two parallel creases, and a
75 second set of two pairs of creasing-rollers, between which the paper tube is fed after leaving the first pair, the creasing-surfaces of the second set of rollers being arranged oppositely to those of the first set, whereby each
80 of the transverse creases is formed in both directions.

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

WILLIAM B. PURVIS.

Witnesses:

ERNEST HOWARD HUNTER,
A. J. DUNN.