

(No Model.)

W. A. LORENZ.
PAPER BAG MACHINE.

3 Sheets—Sheet 1.

No. 418,201.

Patented Dec. 31, 1889.

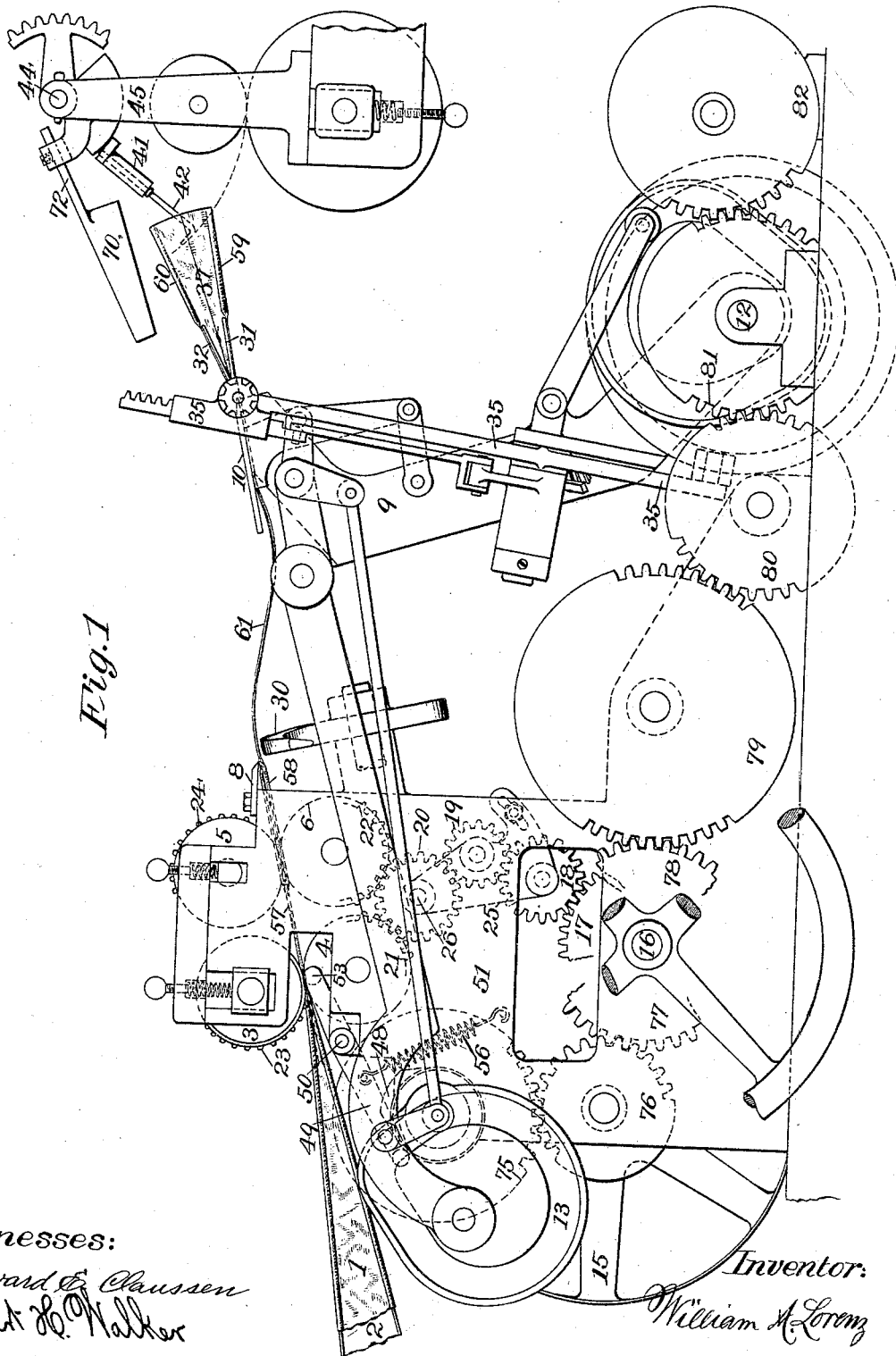


Fig. 1

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Inventor:

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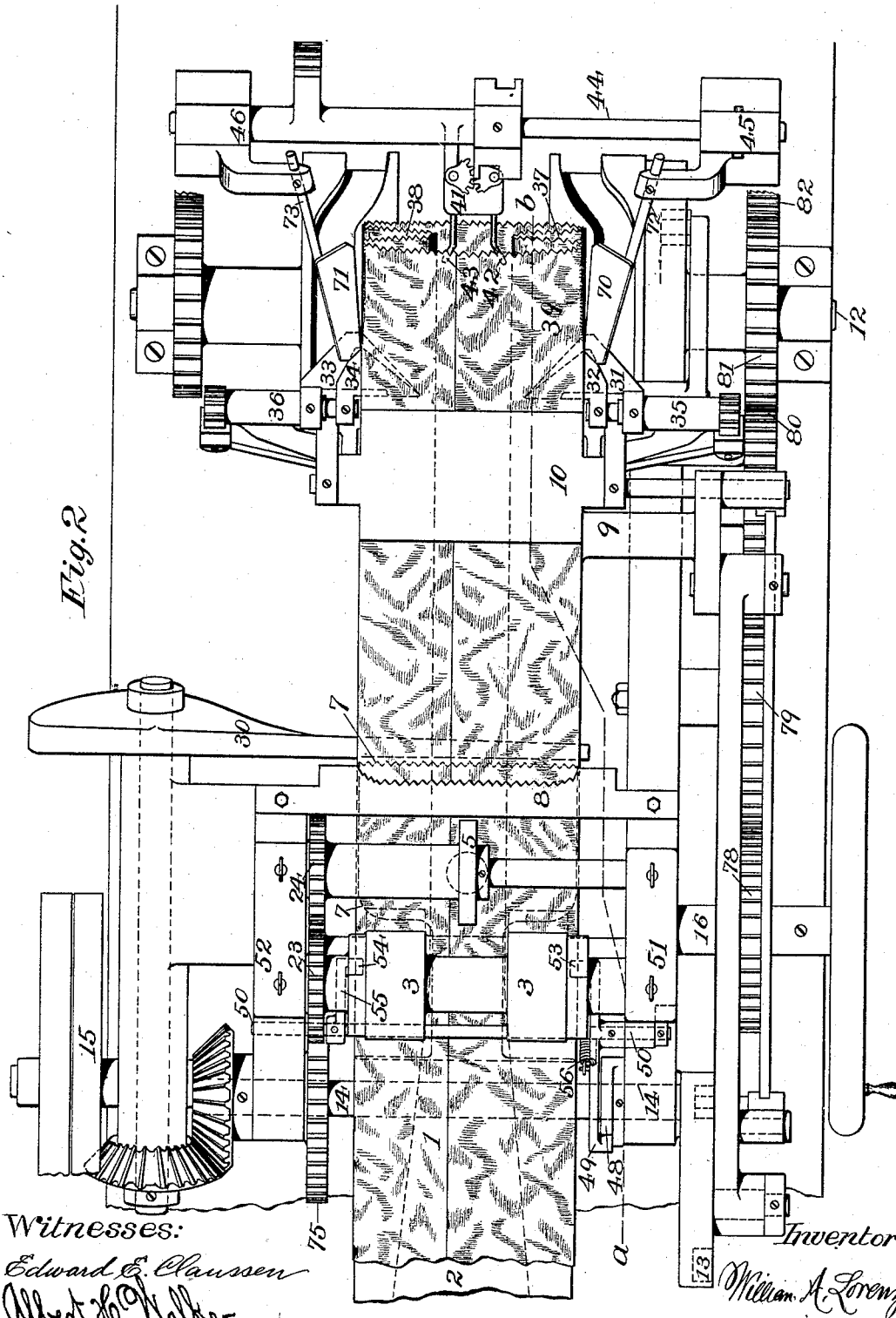
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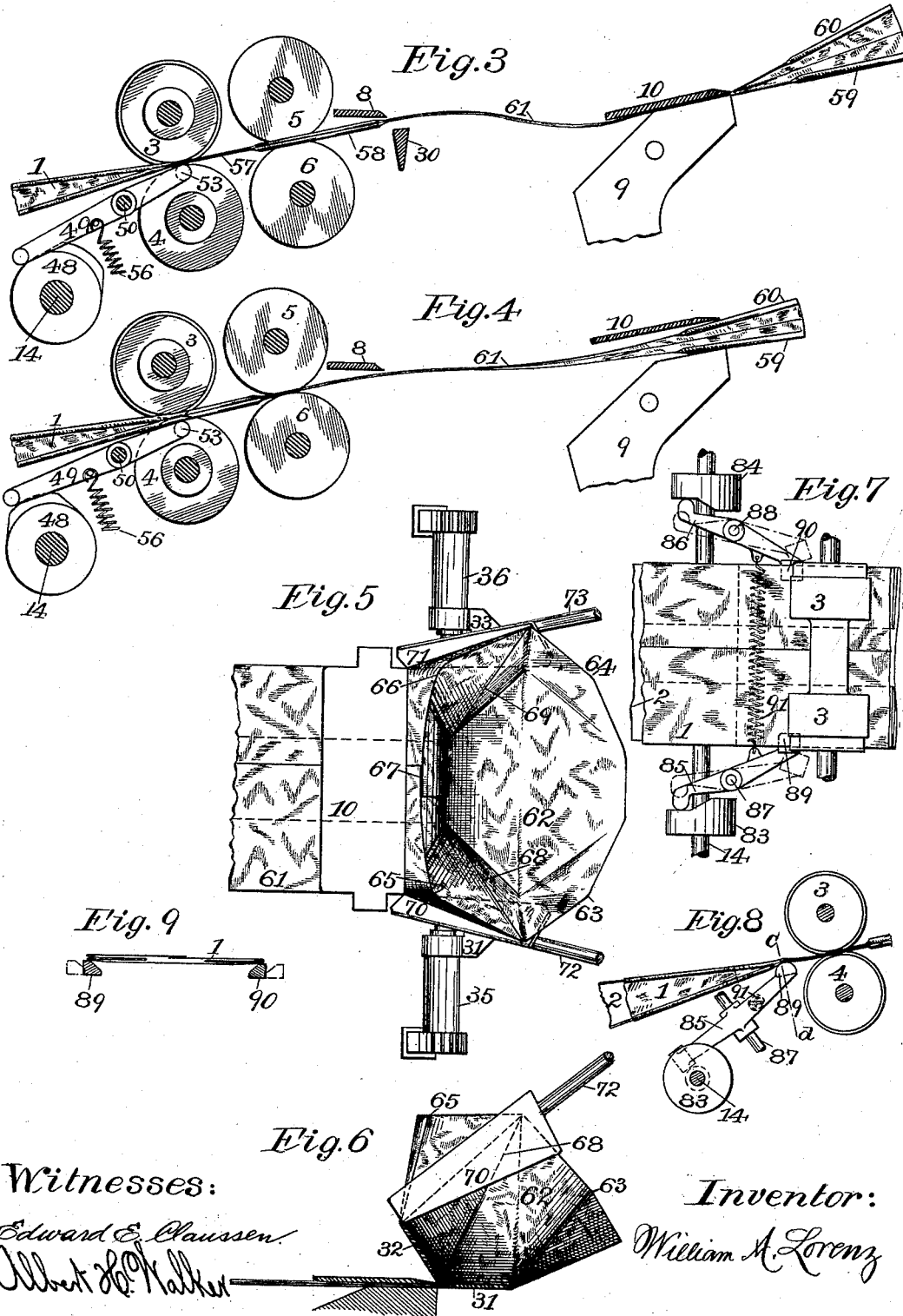
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UNITED STATES PATENT OFFICE.

WILLIAM A. LORENZ, OF HARTFORD, CONNECTICUT.

PAPER-BAG MACHINE.

SPECIFICATION forming part of Letters Patent No. 418,201, dated December 31, 1889.

Application filed June 26, 1889. Serial No. 315,665. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. LORENZ, of Hartford, Connecticut, have invented certain new and useful Improvements in Paper-Bag Machines, of which the following description and claims constitute the specification, and which is illustrated in the accompanying three sheets of drawings.

These improvements consist in mechanism for creasing the edges of paper tubes from which paper bags are made at predetermined intervals along those edges; and it consists, also, in devices to support the sides of the opened end of such a paper tube during a part of the operation necessary to folding those sides into the bottom of the bag.

These improvements are particularly applicable to the paper-bag machine described and shown in Letters Patent of the United States, No. 361,951, granted to Lorenz and Honiss April 26, 1887; but they may be applied to other paper-bag machines also.

Figures 1 and 2 are a side elevation and a plan view, respectively, of that part of the Lorenz and Honiss machine with which my present improvements are incorporated. Figs. 3 and 4 are longitudinal sections on line *ab* of Fig. 2 of parts of the machinery shown in Figs. 1 and 2. Figs. 5 and 6 are a plan and a side view, respectively, of my new supporting devices. Figs. 7 and 8 are a plan and a side view, respectively, of a modified form of the edge-creasing mechanism; and Fig. 9 is a lateral section on the line *cd* of Fig. 8.

In the drawings the gears 17, 21, 22, 23, 24, 75, 76, 77, 78, 79, 80, 81, and 82 have parts broken away or teeth omitted in order to promote clearness of representation.

The numeral 1 indicates a tucked paper tube being drawn from the former 2, upon which it is made. This tube passes between the drawing-rolls 3 and 4 to the pressing-rolls 5 and 6, and then over a float or knife 7, which is fastened by a shank to the former 2, and thence under a lip-knife 8, and thence into a rocking carriage 9, passing between the top of the carriage and the presser-plate 10, which plate holds the paper tube down upon the carriage. The carriage is pivoted on the shaft 12, and is rocked forward and backward by a connecting rod and crank, and the presser-plate 10 is raised and lowered on top of the

carriage by a cam 13 upon the shaft 14 and suitable mechanism connecting them. Motion is given to the shaft 14 through intermediate mechanism by the pulley 15, and motion is given to the drawing-rolls 3 and 4 and to the pressing-rolls 5 and 6 in the following manner: Upon the hand-wheel shaft 16 a change-gear 17 is placed, which meshes into an intermediate gear 18, and the latter meshes into a second intermediate gear 19, which meshes into the intermediate gear 20, and which latter gear engages both the lower drawing-roll gear 21 and the lower pressing-roll gear 22, and those respectively drive the lower rolls 4 and 6. The gears 21 and 22 mesh into the gears 23 and 24, respectively, and they drive the upper rolls 3 and 5. The gears 18 and 19 are held by a yoke 25, swinging from a pivot 26, which permits the change of the change-gear 17 in the usual manner. The hand-wheel shaft 16 and the cam-shaft 14 are driven with uniform speed. The revolving striker 30 operates to sever a bag-blank from the forward end of the tube 1 at each revolution of the shaft 14. The pairs of blades 31 and 32 and 33 and 34 are carried upon the levers 35 and 36, and those blades are rocked into the tucks 37 and 38 of the bag-bottom 39, and out therefrom by the motions of the levers 35 and 36, which motions are derived from suitable cams upon the shaft 12. The upper one of each member of those pairs of blades is turned over backward by means of another cam on the shaft 12 and the intermediate mechanism indicated in Figs. 1 and 2. The sweeper-arm 41, carrying the fingers 42 and 43, revolves with the shaft 44, which is supported by the brackets 45 and 46. The machinery mentioned in this paragraph is substantially identical in construction, mode of operation, and function with the corresponding machinery shown and described in the said Lorenz and Honiss patent of April 26, 1887, and therefore needs not to be more particularly described herein.

The description of the new mechanism for creasing the tucked paper tube is as follows: A cam 48 revolves upon the shaft 14 once for each revolution of the striker 30, and therefore once for each blank severed from the forward end of the continuous tucked paper tube. This cam raises one end of the lever

49 once during each of its revolutions. That lever is pivoted by the cross-shaft 50, which is journaled in the brackets 51 and 52. The other end of that lever terminates under the drawing-roll 3 in the projection 53. An arm 55 is also fixed to the shaft 50 at the other side of the machine, and is provided with the projection 54 under the other end of the drawing-roll 3. Thus the two projections 53 and 54 project under the opposite ends of the drawing-roll 3 far enough to pass beneath the outer edges of the tucked paper tube. A spring 56, the lower end of which is fixed to the frame of the machine and the upper end of which is attached to the long arm of the lever 49, draws that arm downward, and thus draws the projections 53 and 54 upward against the tucked paper tube between them and the drawing-roll 3 whenever the cam 48 has not raised the long arm of the lever 49 against the resistance of that spring.

The operation of this mechanism is as follows: At each revolution of the shaft 14 the cam 48 raises the lever 49 upward, and thus depresses the projections 53 and 54 away from all contact with the tucked paper tubing. When that absence of contact is continued long enough to permit that portion of the tucked paper tubing which is not to be creased at its edges to pass those projections, the cam 48 allows the spring 56 to draw the lever 49 downward, and thus to raise the fingers 53 and 54 into contact with the tucked paper tubing, and thus to press and crease the rounded edges thereof against the drawing-roll 3, and thus to produce the creased reach 57 in each edge of that tubing, as shown in Fig. 3, the uncreased reach 58 having passed between the projection 53 and the drawing-roll 3 when that projection was held out of contact with that drawing-roll by the cam 48. The relative lengths of the creased and uncreased reaches of the edges of the tucked paper tube may be changed to suit particular purposes by altering the cam 48, so as to make it keep the lever 49 raised a greater or a less length of time, as desired. The uncreased reach 58 in Fig. 3 is shown in Fig. 4 as divided into two uncreased reaches 59 and 60 of the outer bends of the tuck in the nearest edge of the tucked paper tube. The purpose of leaving these reaches 59 and 60 uncreased, and of leaving corresponding uncreased reaches on the other side of the tube, is to enable the subsequent folding of the box-like form 62, which is shown in Figs. 5 and 6, to be done with greater facility and certainty than was previously possible. This greater facility and certainty results from the fact that the roundness of the corners 63, 64, 65, and 66, which results from leaving those edges uncreased, enables the forward end of the tube to be opened out into the box-like form by the blades 31, 32, 33, and 34 without kinks being made in the paper. The purpose of making the creased reach 57 and the corresponding creased reach 61 along the

edge of the rear part of each length of tucked paper paper tube, and making a corresponding creased reach on the opposite edge thereof, is to enable that tube to pass between the carriage 9 and the presser-plate 10 to its position between the two pairs of tuck-blades with greater accuracy than it otherwise would, and to enable those tuck-blades to enter the tucks with greater ease and certainty than they would do if the tucks were not thus somewhat opened by that creasing, and also to enable the rear end of each length of tucked paper tube to be severed from the forward end of the next length which follows it by the striker 30 with more accuracy than would otherwise result.

A modified form of the edge-creasing apparatus is shown in Figs. 7, 8, and 9, where the two face-cams 83 and 84 revolve with the shaft 14 and respectively operate the levers 85 and 86. Those levers are pivoted upon the pins 87 and 88, respectively, which are supported by brackets fixed in the frame of the machine. The working ends of the levers 85 and 86 are provided with projections 89 and 90, and those projections are drawn and held under the respective edges of the tucked paper tube by the spring 91 whenever the face-cams do not force the opposite ends of the levers toward each other and those projections away from each other against the resistance of that spring. The projections 89 and 90 are beveled on their upper and inner sides, as shown in Fig. 9, and when brought together they press the edges of the tucked paper tube against the resistance of its own tensile strength, and thus crease those parts of those edges with which at intervals they are brought in contact. Where uncreased reaches of the tucked paper tube are required, the projections 89 and 90 are forced out of contact with the edges thereof by the cams 83 and 84.

Other modifications of the creasing apparatus adapted to bear on the edges of tucked paper tubing at intervals may be made without departing from the essential character of this invention, and any such apparatus may be made to operate upon plain flat paper tubing as well as upon tucked paper tubing.

The devices for supporting the sides of the forward end of a length of tucked paper tube while it is being opened out into a box-like form are as follows: Two plates 70 and 71 are fixed to the ends of the rods 72 and 73, respectively, and those rods are respectively fixed to the brackets 45 and 46, so as to give those plates a downward and inward inclination in their positions at the sides of the space which is occupied by the forward end of each length of tucked paper tube when that end is being opened out into the box-like form by the blades 31, 32, 33, and 34. Those plates operate in their positions to support the sides of that box-like form against the tendency of those blades to draw outward and downward those portions of the paper which con-

stitute that box-like form, and which previously constituted the tucks in the tube, and the longitudinal centers of which portions are represented in Fig. 5 by the lines 68 and

5 69. That tendency of those blades to draw downward and outward those portions of the paper, if unresisted by the plates 70 and 71, brings a strain upon the pasted seam 67, and thus tends to open that seam or at least to

10 weaken it.

I claim as my invention—

1. The combination, in a paper-bag machine, of a pair of paper-tube-edge-creasing projections 53 and 54 with a cam or cams and intermediate mechanism, substantially as described, all constructed and combined so that

those projections will make creased reaches at intervals in the edges of the paper tube, all substantially as described.

2. The combination, in a paper-bag machine, 20 of the pair of supporting-plates 70 and 71 with the blades 31, 32, 33, and 34, all so constructed and arranged that those plates support the sides of the forward end of a tucked paper tube when those blades are opening it 25 out into a box-like form, all substantially as described.

Hartford, Connecticut, June 18, 1889.

WILLIAM A. LORENZ.

Witnesses:

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PHEBIE A. PHELPS.