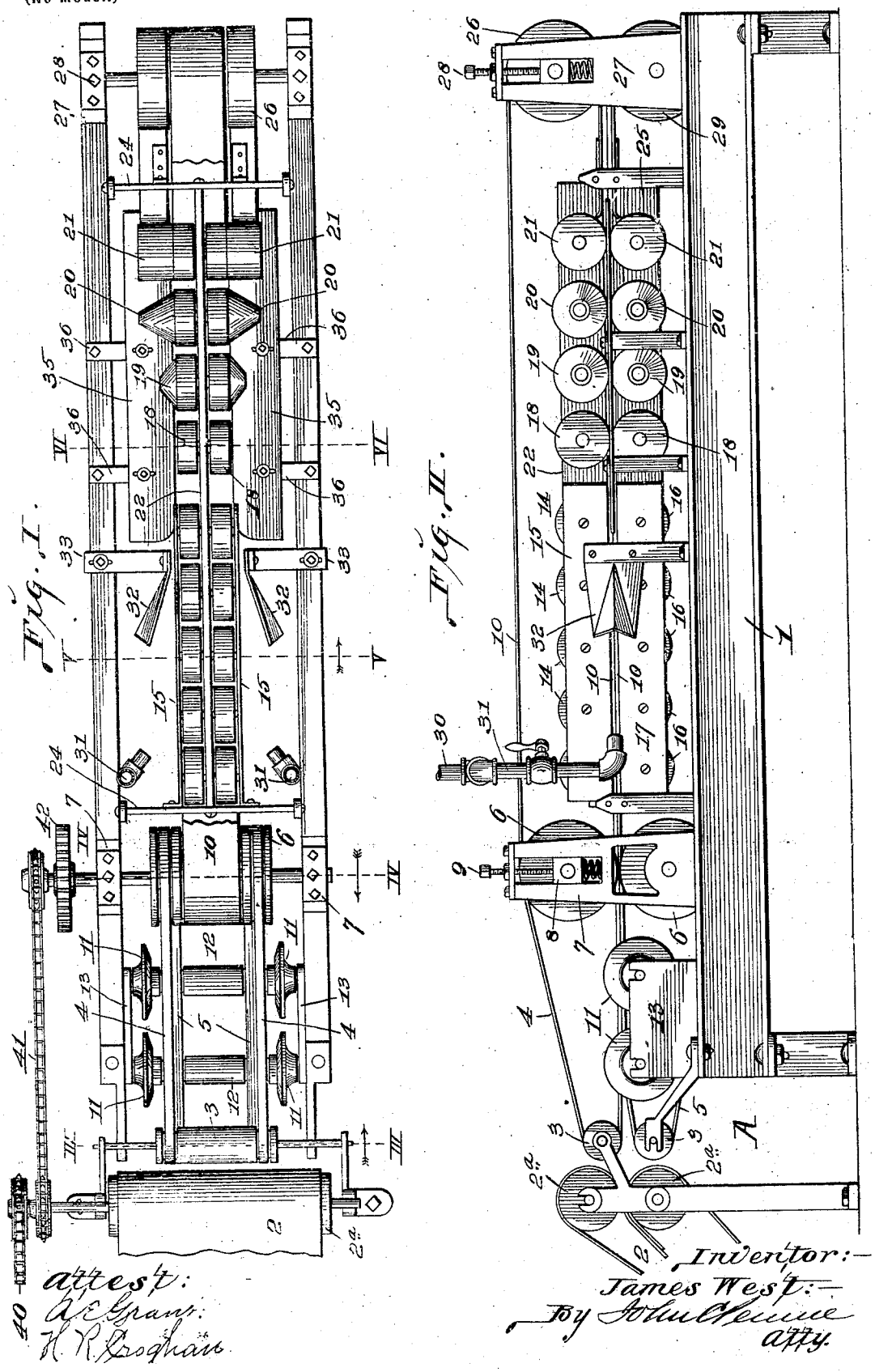
No. 711,369. Patented Oct. 14, 1902.

J. WEST.

PAPER BAG MACHINE.

(Application filed June 28, 1900.)

(No Model.) 3 Sheets—Sheet I.



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A. E. Grant.
H. R. Croghan

Inventor:—
James West:—
By John Clemme
Atty.

THE ECKLEY LITHOGRAPHING CO., WASHINGTON, D. C.

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(Application filed June 28, 1900.)

(No Model.) 3 Sheets—Sheet 2.

Fig. III.

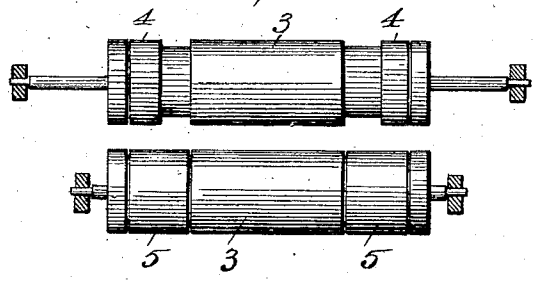


Fig. IV.

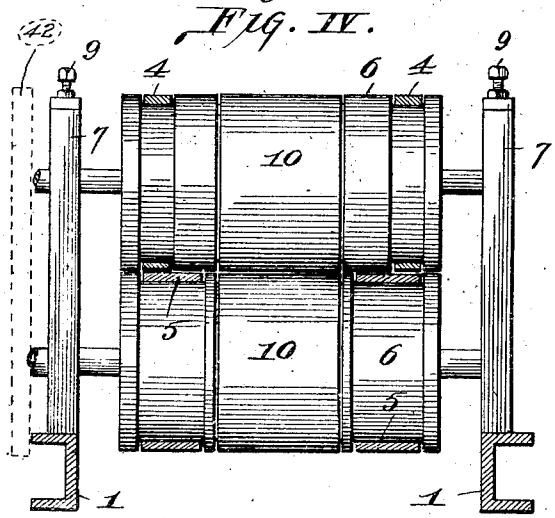


Fig. VI

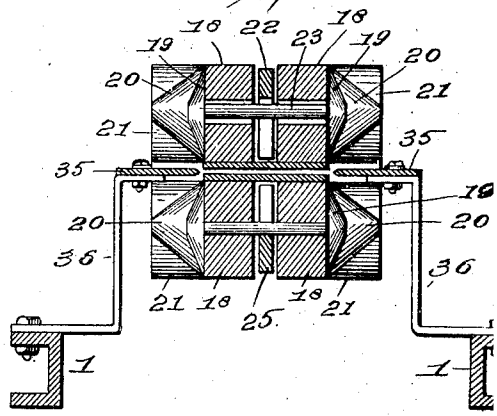


Fig. VII

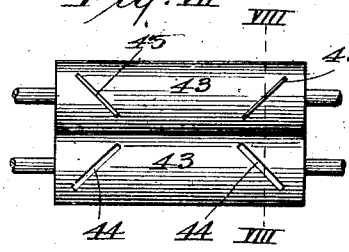


Fig. V

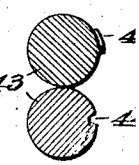


Fig. IX

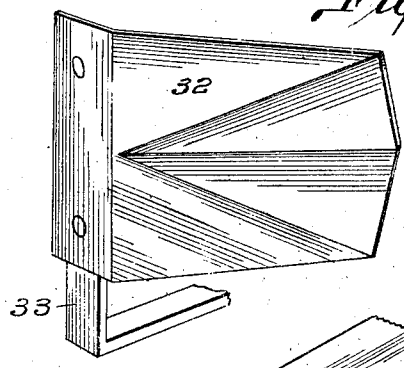


Fig. V.

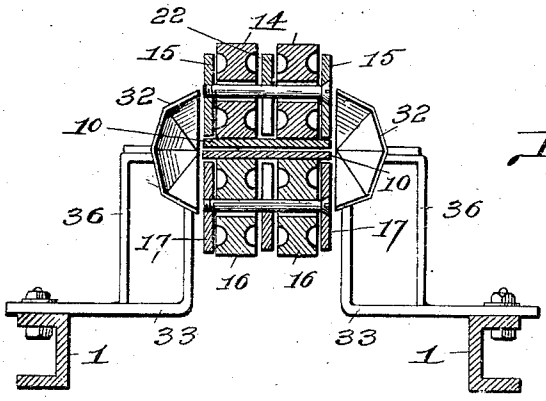
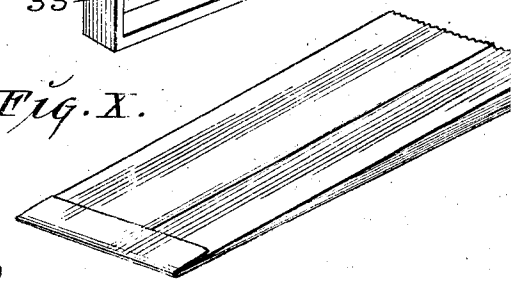


Fig. X.



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THE ECKERT LITHOGRAPHING CO., WASHINGTON, D. C.

No. 711,369. Patented Oct. 14, 1902.

J. WEST.

PAPER BAG MACHINE.

(Application filed June 28, 1900.)

(No Model.) 3 Sheets—Sheet 3.

Fig. XI

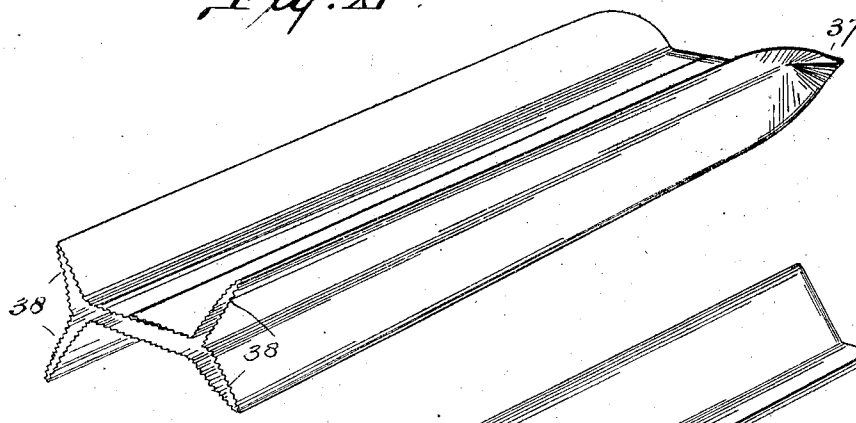


Fig. XII

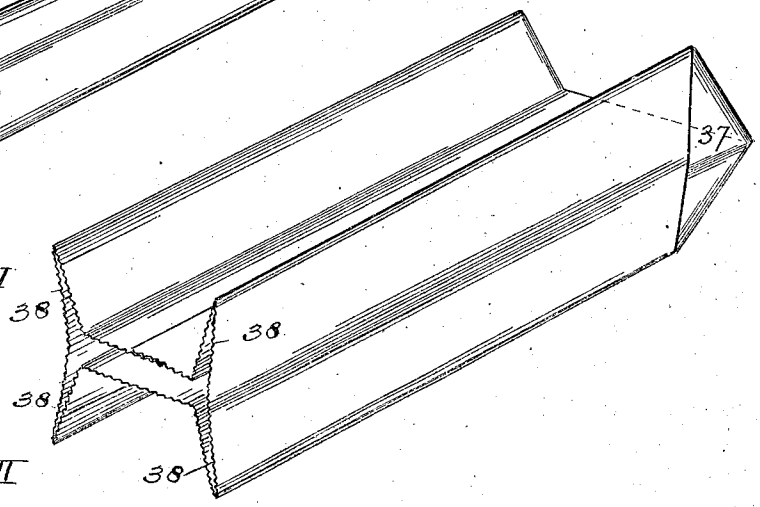


Fig. XIII

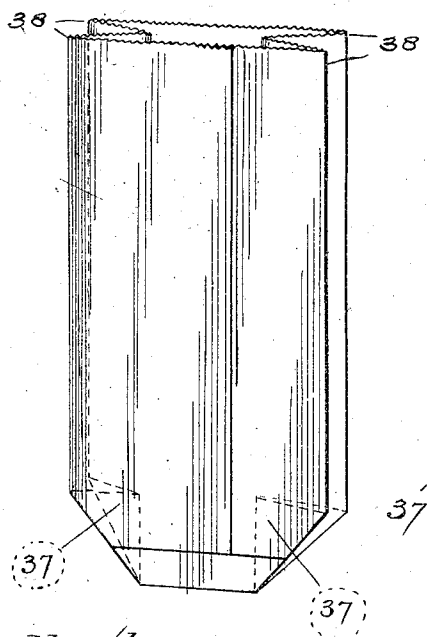
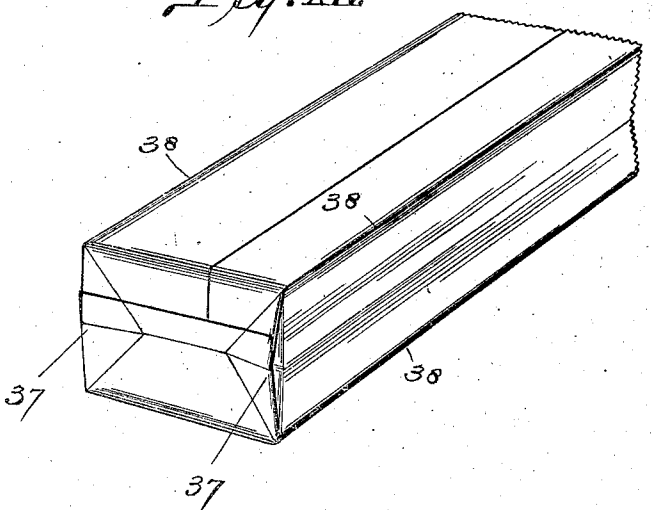


Fig. XIV



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UNITED STATES PATENT OFFICE.

JAMES WEST, OF ST. LOUIS, MISSOURI, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE UNION PAPER BAG MACHINE COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

PAPER-BAG MACHINE.

SPECIFICATION forming part of Letters Patent No. 711,369, dated October 14, 1902.

Application filed June 28, 1900. Serial No. 21,883. (No model.)

To all whom it may concern:

Be it known that I, JAMES WEST, a citizen of the United States of America, residing in the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Paper-Bag Machines, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

My invention relates to a machine for forming folds or tucks in the bottom of an ordinary "square" paper bag, so as to make the bag "self-open," as it is termed in the trade, by which is meant that as the bag is filled its bottom naturally assumes a square or rectangular shape, as shown in Figure XIV of the drawings.

According to my invention this object is accomplished by means of a blast of air acting against and employed for the purpose of opening up the side folds of the bag as it is fed into the tucking-machine and mechanical devices working with the blast to perform the work of forming the tucks in the bottom of the bag.

My invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Fig. I is a top or plan view of my machine. Fig. II is a side elevation. Fig. III is an enlarged vertical section taken on line III III, Fig. I, looking in the direction of the arrow that crosses the section-line. Fig. IV is an enlarged vertical section taken on line IV IV, Fig. I, looking in the direction of the arrow. Fig. V is an enlarged vertical section taken on line V V, Fig. I, looking in the direction of the arrow. Fig. VI is an enlarged vertical section taken on line VI VI, Fig. I. Fig. VII is a view showing a pair of creasing-rollers in elevation. Fig. VIII is a transverse section taken on line VIII VIII, Fig. VII. Fig. IX is a perspective view of one of the folders. Fig. X is a perspective view of an ordinary paper bag as it enters my machine. Figs. XI to XIV, inclusive, are perspective views; Fig. XI, a view of the bag when the sides are opened by the air-blast; Fig. XII, a view of the bag when the bottom corners are turned back of the folders; Fig. XIII, a view of the completed bag with the corners tucked in and the sides turned down, and Fig. XIV a view of the bag as it opens out when being filled in use.

Referring to the drawings, 1 represents the main frame of the machine, at the end A of which is a pair of delivery-belts 2, that pass around rollers 2^a and conduct the bag through the machine either direct from a bag-forming machine or otherwise.

3 represents a pair of grooved drums suitably journaled at the end A of the machine, and the upper one of which receives a pair of narrow belts 4, while the lower one receives a pair of narrow belts 5, these belts passing also around a pair of grooved drums 6, journaled in standards 7, mounted on the base 1 of the machine. The boxes 8 of the upper drum 6 are preferably spring-supported, as shown in Fig. II, and may be adjusted vertically by set-screws 9.

The belts 4 and 5 receive the bags from the belts 2 and conduct them to a pair of belts 10, between which they enter. The belts 10 fit in grooves made in the central parts of the drums 6, between the grooves that receive the belts 4 and 5. The belts 4 and 5 carry the bags by contacting with their edges, and the belts 10 carry them by contacting with their middle parts, the bags being conducted through the machine end on end with their bottoms foremost. As the belts 10 engage only the middle parts of the bags, the sides of the bags are left free to be operated upon in forming the folds of the bottoms of the bags.

It is important that the bags shall be delivered accurately to the belts 10 and in direct line with the length of the machine. To accomplish this, I provide cone-shaped guide disks or rollers 11 outside of the belts 4 and 5, as shown in Figs. I and II, these rollers being arranged on shafts 12, journaled in brackets 13, mounted on the frame 1, or they may be otherwise suitably supported. The belts 4 and 5 bear but lightly against the bags, so that the latter can be shifted by the cone-shaped rollers or disks 11 if they are out

of line with the length of the machine, and thus be delivered accurately to the belts 10. Above the under part of the upper belt 10 and resting thereon are a series of rollers 14, journaled in plates 15, secured to the frame 1. As shown in Fig. V, the openings in the rollers that receive the journal-pins are somewhat larger than the pins, so that the rollers will rest by gravity on the belt, and thus hold the belt by a yielding force against the bags. Beneath the rollers 14 and beneath the upper part of the lower belt 10 are a series of rollers 16, journaled in plates 17, carried by the frame 1, the upper part of the under belt 10 passing over the rollers 16, as shown.

Beyond the series of rollers 15 and 16 is an upper and lower pair of rollers 18, these rollers having flat ends, as shown in Fig. I. Beyond the rollers 18 is an upper and lower pair of rollers 19, these rollers having cone-shaped ends, as shown in Fig. I. Beyond the rollers 19 is an upper and lower pair of rollers 20, the ends of which are also made conical, as shown Fig. I, but having more taper than the rollers 19. Beyond the rollers 20 is an upper and lower pair of wide rollers 21 with flat ends, as shown in Fig. I. The upper rollers 18, 19, 20, and 21 rest upon and are carried by the upper belt 10, these rollers being held in position by a distance-plate 22, that is notched to receive the axis-pin 23 of the rollers, as shown in Fig. VI. This plate also extends over the rollers 14 and is notched to receive the journal-pins of these rollers. The plate is supported by end pieces 24, secured to the frame 1. The lower rollers 18, 19, 20, and 21 are supported by a notched distance-plate 25, properly supported from the frame 1 of the machine, this plate also extending across the lower rollers 16 and is notched to receive the journals of these rollers.

The forward end of the upper belt 10 passes around a grooved drum 26, journaled in standards 27, secured to the frame 1 of the machine, this roller being preferably mounted in spring-supported boxes made adjustable by set-screws 28, as shown in Fig. II. The forward end of the lower belt 10 passes around a grooved drum 29, journaled also in the standards 27.

30 represents an air-pipe having valved branches 31, the open ends of which are presented inwardly and toward the forward end of the machine, as seen in Fig. I, these branches being located opposite the rollers 14 and 16 and preferably opposite the most rearward pair of these rollers. Opposite the rollers 14 and 16 is also a pair of folding V-shaped blades 32, (see Figs. II and IX,) supported by brackets 33, adjustably secured to the frame 1 of the machine. The shape of these folders is illustrated in Fig. IX, and their position on the machine with relation to the rollers 14 is illustrated in Figs. I and II. Forward of the folders 32 is a pair of tucking blades or plates 35, adjustably secured to brackets 36, that are supported by the frame 1. The forward edges of these blades or plates are opposite the rollers 18, 19, 20, and 21, and the forward edges of the plates fit between the outer portions of the rollers 19, 20, and 21.

In operating the machine the bags are delivered by the belts 2 to the belts 4 and 5 and by the latter belts to the belts 10. As the bags are carried along by the belts 4 and 5 they are straightened to bring them in line with the length of the machine by means of the cone-shaped disks or rollers 11, so that when delivered to the belts 10 the bags will be in perfect alinement with the machine. As the bags are carried forward by the belts 10 the air-blast which is directed against the folded sides of the bag opens up the sides, as shown in Fig. XI, and as the bag proceeds the folding-blades 32 bend back the corners 37 of the bag to the position shown in Fig. XII, and as the bag is carried still farther forward the plates 35 tuck the corners 37 well back against the sides of the bag under the cone-shaped rollers 19 and 20, which causes the sides to be folded against the plates 35, and the rollers 21 press the sides firmly against the plates, so as to make a complete folding of the bag with its tucked-in lower corners, as shown in Fig. XIII.

When the bag is to be used, the mouth of it is opened, and as it is filled it will open out to the position shown in Fig. XIV.

By using a blast of air to open up the sides of the bag in order to give the mechanical appliances above described a chance to fold and tuck in the corners of the bottom of the bag a very inexpensive and effective means is provided for accomplishing this purpose.

The belts 2 are driven by a sprocket-chain 40 from a suitable motive power, and the belts 4, 5, and 10 are driven by a sprocket wheel and chain connection 41 between the shaft of one of the belts 2 and the shaft of the upper roller 6, the shaft of the upper roller 6 being connected to the shaft of the lower roller 6 by a pair of pinions 42. (See Fig. I and dotted lines, Fig. IV.)

If it is desired to form creases in the bottom of the bag at the place where the corners are bent by the folders 32, this may be done by interposing a pair of rollers 43 (see Figs. VII and VIII) between the belts 2 and the rollers 3, one of these rollers having a pair of recesses 44 and the other a pair of blades 45, so that as the bags pass between the rollers, properly timed, the blades will act upon them to crease them at the points where they will be bent when they come in contact with the folders 32.

I claim as my invention—

1. In a machine of the class described, means for directing a blast of air against a bag to open up the sides thereof, in combination with folders for bending back the corners of the bag, substantially as described

2. In a machine of the class described, the combination of means for directing a blast of air against the bag to open up the sides thereof, means for folding back the corners of the bag, and means for pressing the sides of the bag down onto the corners, substantially as set forth.

3. In a machine of the class described, the combination of means for directing a blast of air against a bag for opening up the sides thereof, means for folding back the corners of the bag, means for tucking in the corners of the bag, and means for pressing the sides of the bag down onto the corners, substantially as described.

4. In a machine of the class described, the combination of means for directing a blast of air against a bag to open up the sides thereof, and V-shaped blades for folding back the corners of the bag, substantially as set forth.

5. In a machine of the class described, the combination of means for directing a blast of air against a bag to open up the sides thereof, V-shaped blades for folding back the corners of the bag, and plates for tucking in the corners, substantially as set forth.

6. In a machine of the class described, the combination of means for directing a blast of air against a bag to open up the sides thereof, V-shaped blades for folding back the corners of the bag, stationary plates for tucking in the corners, and rollers having graduated cone-shaped ends for pressing the sides of the bag down onto the corners, substantially as set forth.

7. In a machine of the class described, the combination of means for directing a blast of air against a bag to open up the sides thereof, blades for folding back the corners of the bag, stationary plates for tucking in the corners, and a series of pairs of rollers for progressively pressing the sides of the bag down onto the corners, said rollers having cone-shaped ends of progressively-varying angle, substantially as set forth.

8. In a machine of the class described, the combination of means for directing a blast of air against a bag to open up the sides thereof, means beyond the air-blast for folding back the corners of the bag, and means for directing the bags accurately to the machine, consisting of a pair of belts and cone-shaped rollers located in the rear of the air-blast, substantially as described.

9. In a machine of the class described, means for directing a blast of air against a bag for opening up the sides thereof, belts between which the bags are carried while being operated upon, rollers located over and beneath the belts, and means for folding back the corners of the bag, substantially as set forth.

10. In a machine of the class described, the combination of means for directing a blast of air against a bag to open up the sides thereof, belts between which the bags are carried while being operated upon, loose rollers located over one of the belts, rollers located beneath the other belt, and means for folding back and in the corners of the bag and means for pressing the sides of the bag down upon the corners, substantially as described.

11. In a machine of the class described the combination with feeding mechanism acting on the center of the bellows-folded bags, of means for distending the bellows-folded sides, means for tucking in the corners of the bag, flat plates, as 35, arranged to hold in the corners in tucked-in position and a series of rollers of progressively-increasing cone shape for gradually bending down the bellows folds over the plates 35.

JAMES WEST.

Witnesses:
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HENRY DISTLER.