No. 629,888.

Patented Aug. 1, 1899.

E. E. CLAUSSEN.

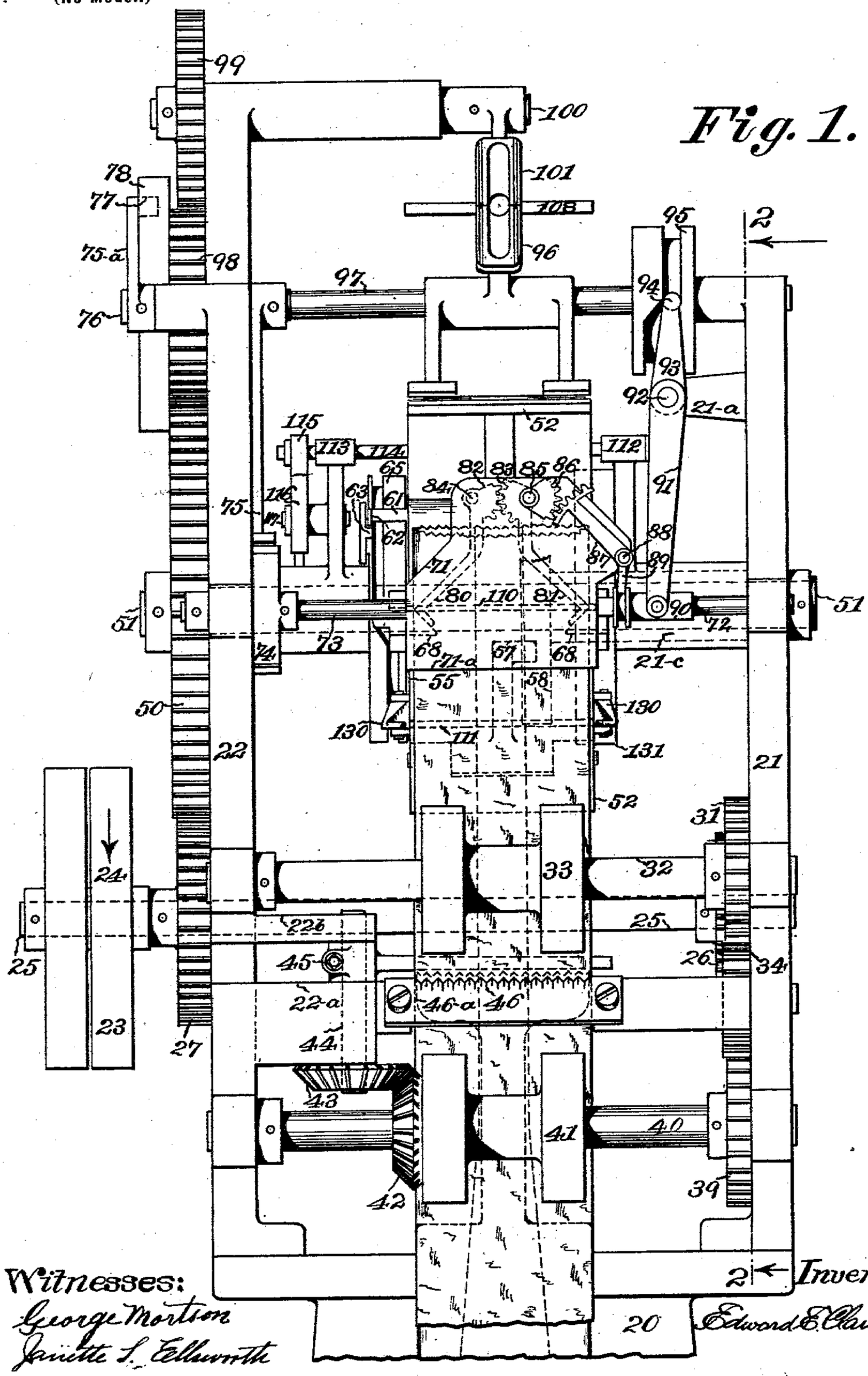
PAPER BAG MACHINE.

(Application filed Apr. 22, 1899.)

(No Model.)

5 Sheets—Sheet 1.

Fig. 1.



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Inventor:
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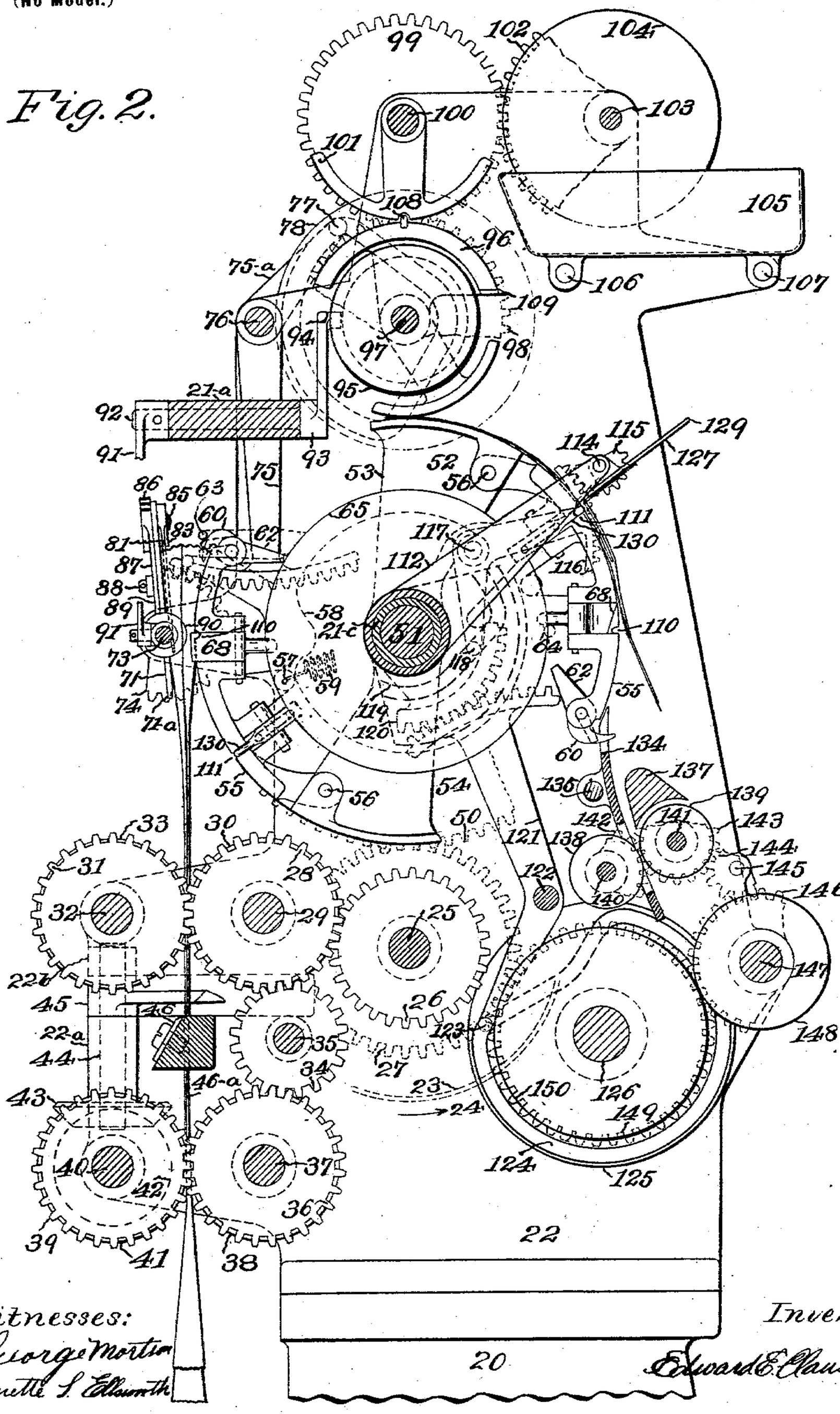
(No Model.) 5 Sheets—Sheet 2.

Fig. 2.



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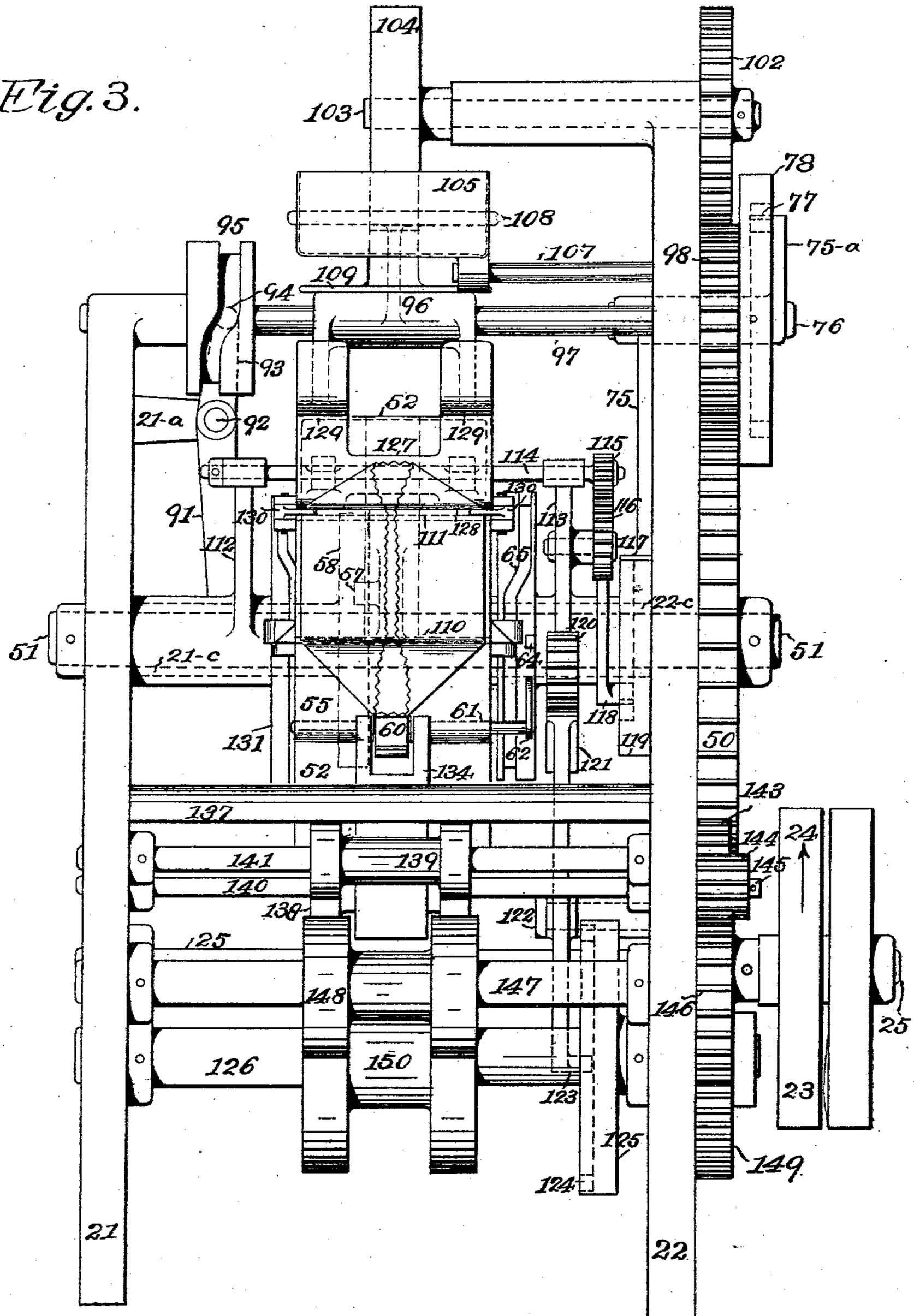
(No Model.) 5 Sheets—Sheet 3.

Fig. 3.



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(No Model.) 5 Sheets—Sheet 4.

Fig. 4.

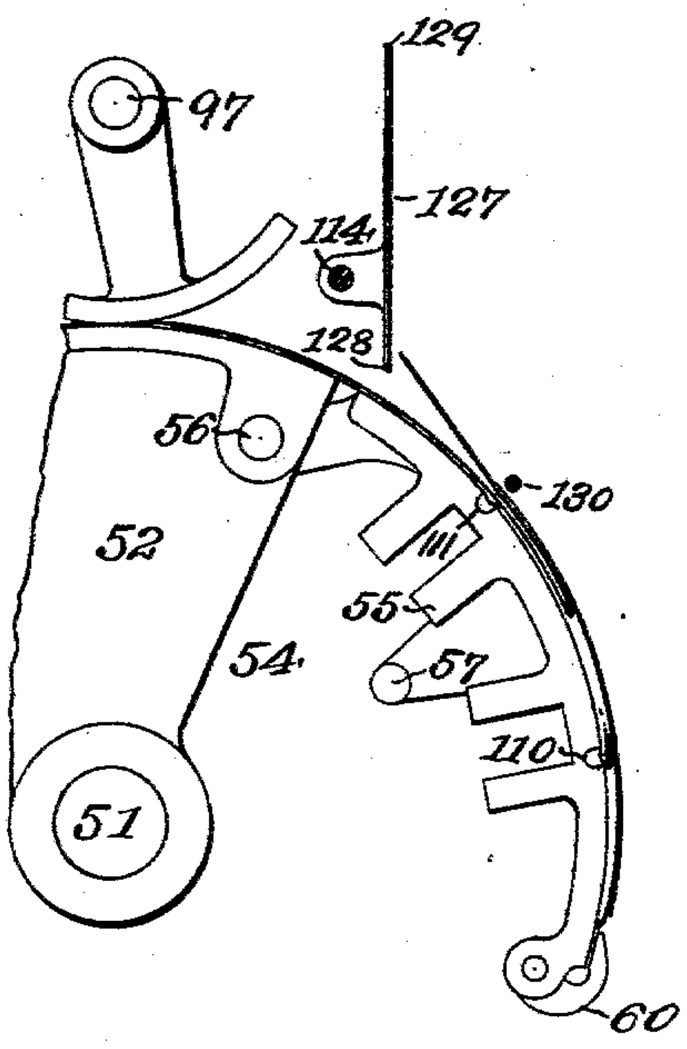


Fig. 5.

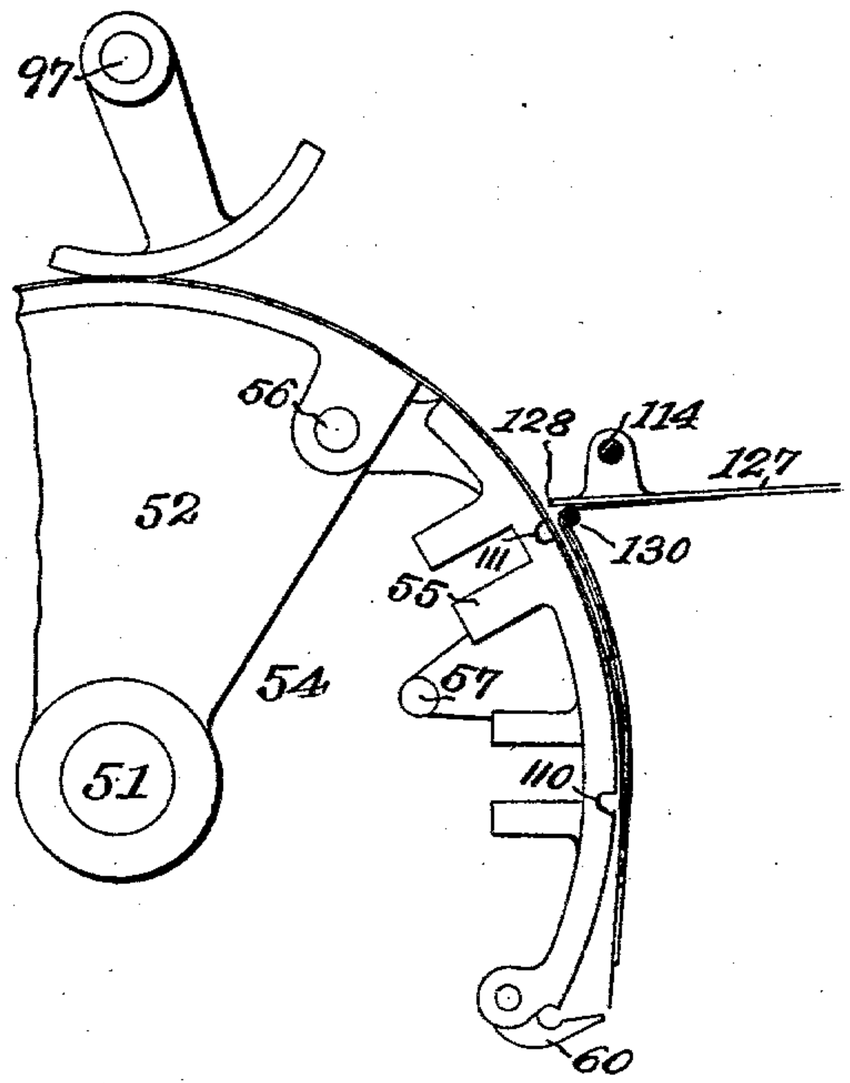


Fig. 6.

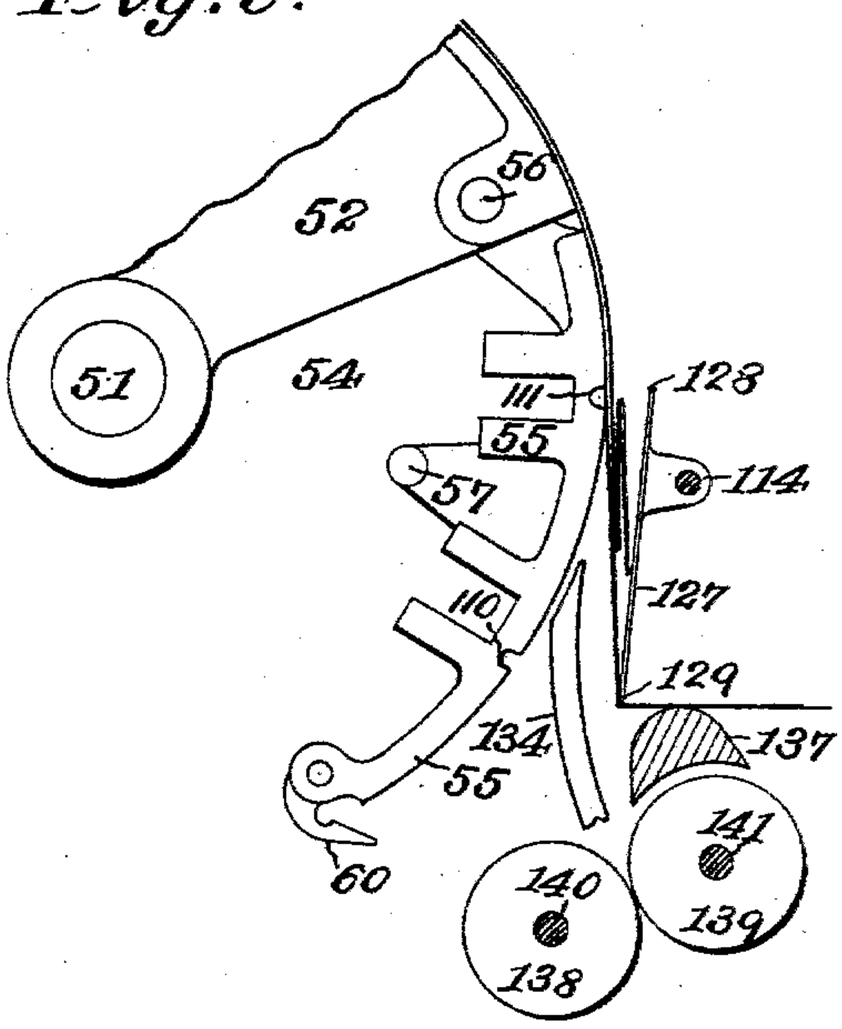
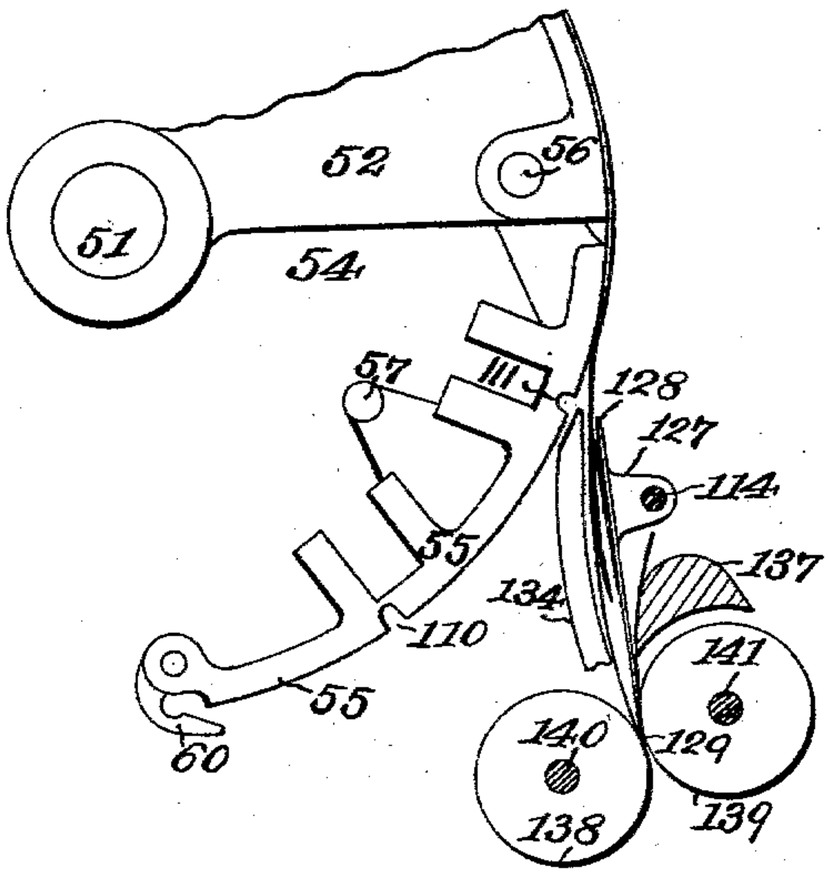


Fig. 7.



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(Application filed Apr. 22, 1899.)

(No Model.)

5 Sheets—Sheet 5.

Fig. 8.

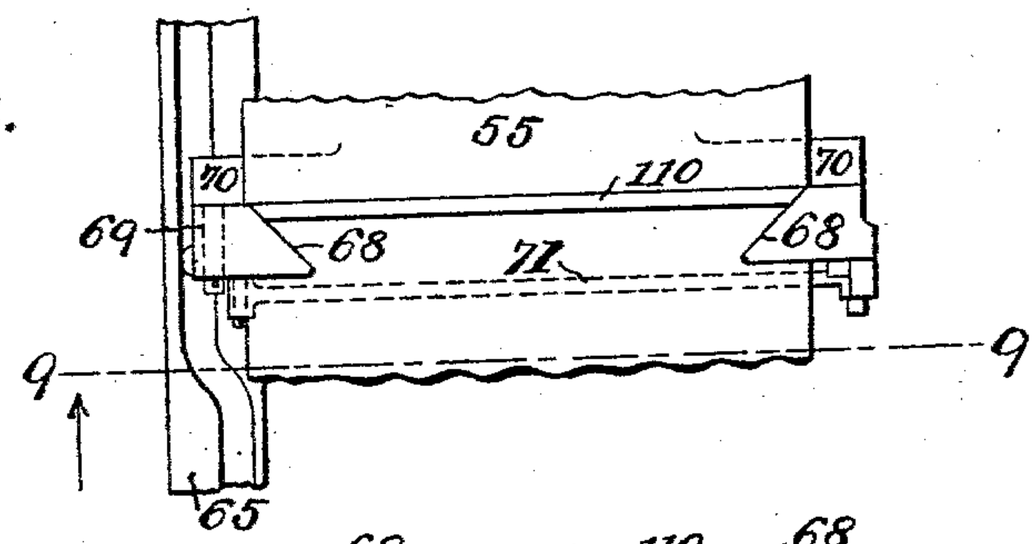


Fig. 9.

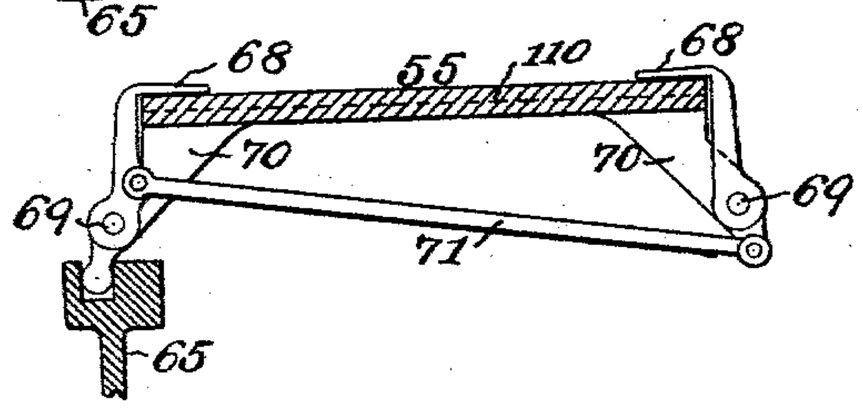


Fig. 10.

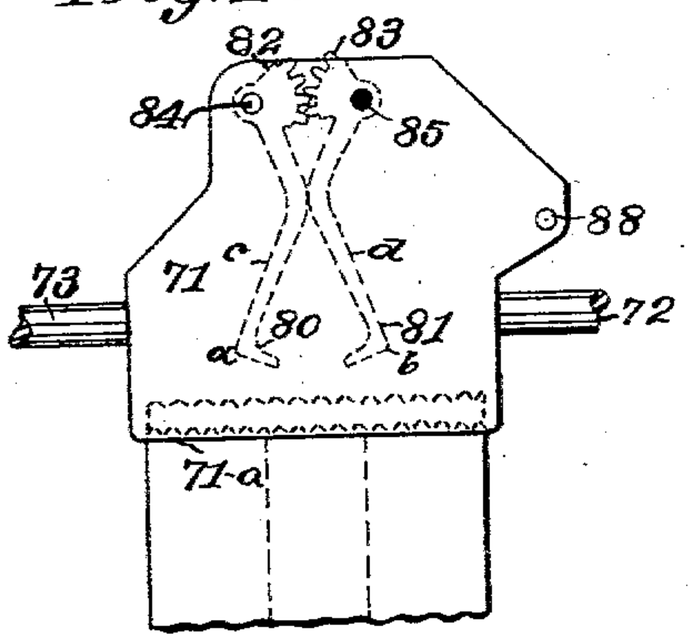


Fig. 11.

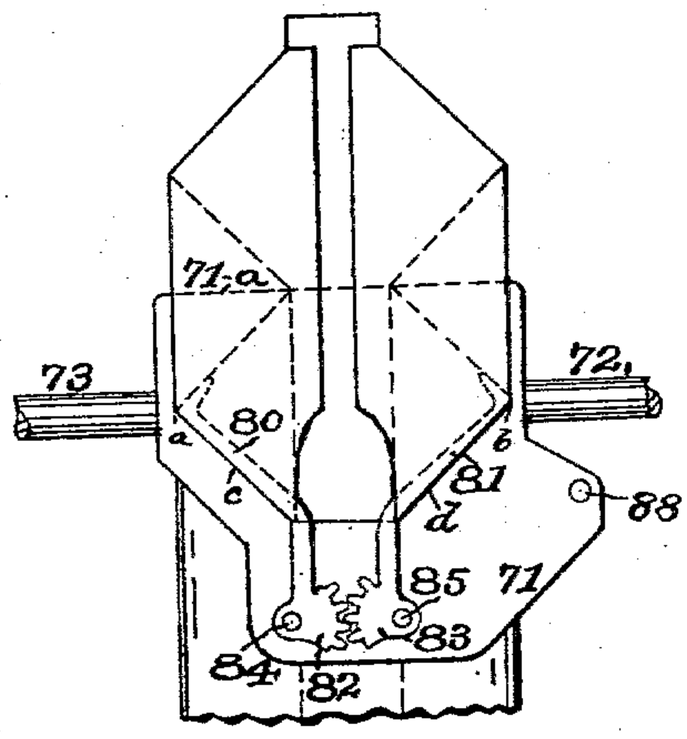


Fig. 13.

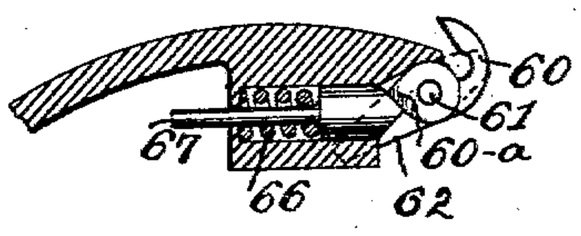


Fig. 12.

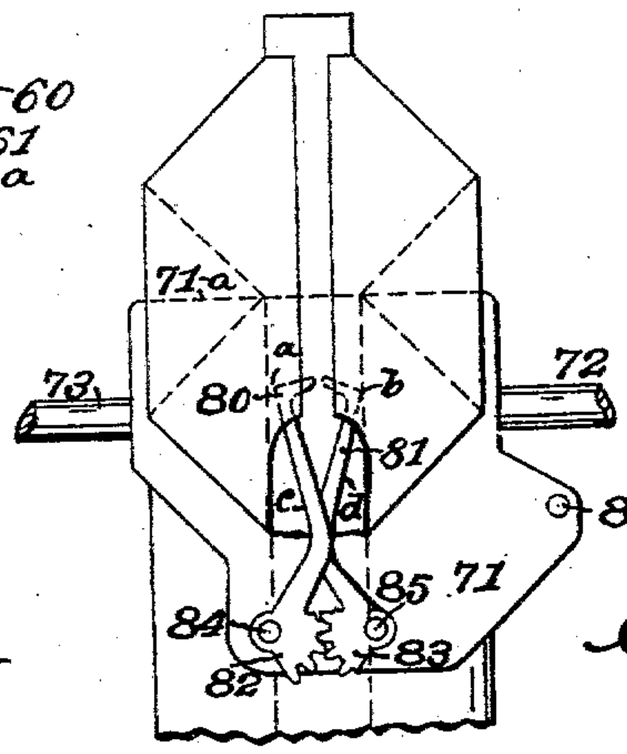
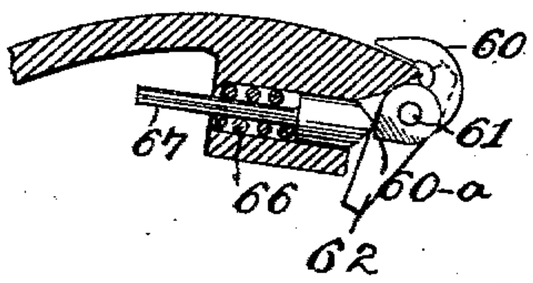


Fig. 14.



Witnesses:
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UNITED STATES PATENT OFFICE.

EDWARD E. CLAUSSEN, OF HARTFORD, CONNECTICUT.

PAPER-BAG MACHINE.

SPECIFICATION forming part of Letters Patent No. 629,888, dated August 1, 1899.

Application filed April 22, 1899. Serial No. 714,043. (No model.)

To all whom it may concern:

Be it known that I, EDWARD E. CLAUSSEN, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Paper-Bag Machines, of which the following is a full, clear, and exact specification.

This invention relates to an improved machine for automatically manufacturing square-bottomed paper bags from tucked-paper tubing.

The mechanism herein shown and described represents this invention in its adaptation to that class of machines in which the traveling folding-bed is represented as a rotating cylinder.

The object of this invention is to provide simple and convenient means for forming the diamond on tucked-paper tubing, then applying the paste, closing the two end flaps, and delivering the completed bag by a single folder mechanism into the delivery-rolls.

The invention will be best understood as described in connection with the drawings, in which it is illustrated and in which—

Figure 1 is a front view of the machine, showing the bottom-forming end of the tucked-paper tube in position ready for the bottom-forming mechanism to operate thereon, it being understood that the blank has been formed by any well-known mechanism and for clearness the parts in the rear of the machine omitted. Fig. 2 represents a sectional side view taken on line 2 2 of Fig. 1 and in the direction of the arrows. Fig. 3 is a rear elevation of the machine and for clearness having the parts at the front of the machine omitted. Figs. 4, 5, 6, and 7 represent diagrammatic edge views of successive steps of the end flaps and the corresponding positions of the flap-folder in operating upon the bag-blank. Fig. 8 is a plan view of the side clips on the cylinder and the mode of operating the same, whereas Fig. 9 is a sectional front view on line 9 9 of Fig. 8 and in the direction of the arrows. Figs. 10, 11, and 12 are front views of the vibrating tucker-plate and defining-fingers in different positions and showing the manner in which they enter the blank, fold the diamond, and then release the completed diamond form to enable the other mechanism to complete the bag-bottom. Figs. 13 and 14 represent sectional side views of the front clip as adapted to the supplemental carrier, the former figure showing the clip closed upon that carrier and the latter showing the clip opened.

In the following specification, of which the accompanying drawings form a part, similar letters and numerals of reference designate like or equivalent parts wherever found throughout the several views.

The arrows indicate, without further explanation, the direction of movement of parts, the positions of the various instrumentalities being shown to best advantage irrespective of the relative positions these parts may have to their respective cam-grooves, and the same is true of all parts hereinafter mentioned, it being considered sufficient for the purpose of this description to assume that the cams are properly cut to effect the various operations required at the proper times and to the proper extent.

The bed 20, which may be of any suitable construction to support the various frames and mechanisms, has supported on its upper surface and on each side thereof the uprights 21 and 22, in which the various shafts and mechanisms are journaled, as more fully described hereinafter.

Motion is communicated to the machine by means of the pulley 23, driven in the direction of the arrow 24, (see Figs. 1, 2, and 3,) fastened to the shaft 25, which is journaled in the uprights 21 and 22 and carries on the inner side of the upright 21 a gear 26 and on the outer side of the upright 22 a gear 27, from which the different motions and mechanisms are driven. The gear 26 meshes into the gear 28, which is fastened to the shaft 29, which is journaled in the uprights 21 and 22 and has fixed upon it the rear drawing-roll 30. The gear 28 meshes into the gear 31, which is fastened to the shaft 32, also journaled in the uprights 21 and 22, and has fastened thereto the upper front drawing-roll 33. The gear 28 meshes into the intermediate gear 34, which is mounted for rotation on the stud 35, fastened to the upright 21 and which meshes into the gear 36, fastened to the shaft 37, which is journaled in the uprights 21 and 22 and has fixed upon it the lower rear drawing-roll

38. The gear 36 meshes again into the gear 39, fastened upon the shaft 40, carrying the lower front drawing-roll 41. Fastened to the shaft 40 on the left-hand side of the drawing-roll 41 is the miter 42, meshing into the miter 43, securely held on the striker-shaft 44, which is journaled in projecting lugs 22^a and 22^b of the upright 22 and carries clamped thereto the striker-arm 45, which revolves across the path of the tube, carrying it against the serrated knife 46 and the float 46^a and severing a blank at each rotation thereof. The gears 28, 31, 36, and 39, with their corresponding rolls 30, 33, 38, and 41, are so geared in relation to the striker-arm 45 that to each revolution of the striker-arm a suitable length of tubing is drawn forward sufficient to make the body and the bottom-forming end of the bag-blank. By the means above described a continuous motion is transferred from the driving mechanism to the drawing-rolls, and the tucked-paper tube is severed into bag-blank lengths and delivered into the bottom-forming mechanisms, which perform their respective functions, as will now be explained.

On the left-hand side of the upright 22 and fastened to the shaft 25, as previously stated, is the gear 27, which meshes into the cylinder-gear 50, fastened to the shaft 51, which is journaled in the uprights 21 and 22 and has fastened thereto the mutilated cylinder 52, having the mutilations or sector-like sections 53 and 54, into which the supplemental carriers 55 are permitted to oscillate. The tops of the supplemental carriers when in their normal position form a part of the surface of that cylinder, as the normal position of the supplemental carrier is the one in which the top or folding surface of the carrier forms a continuation of the circle of the mutilated cylinder. In the drawings two of these supplemental carriers are shown, (indicated by the numeral 55,) and each of those carriers has its rear end pivoted to the cylinder by the shaft 56. On the lower side of the carriers are provided the lugs 57, adapted to engage the stationary cam 58, mounted on the inwardly-projecting bearing 21^c of the upright 21. Springs 59 tend to keep the supplemental carriers in engagement with their cam, which is of such shape that as the supplemental carrier is carried around by the rotation of the cylinder the carrier is caused to be oscillated toward the center of the cylinder and immediately returned to its normal position.

The supplemental carriers are provided with front clips 60, fastened to shafts 61, and their free ends are provided with arms 62, engaging as the cylinder is rotated the stationary pins 63 and 64, fastened to a projecting hub of the side-clip cam 65. Springs 66, acting on plugs 67 and having a beveled edge engaging beveled projections 60^a, tend to keep the clips in an opened or closed position, as best shown in Figs. 13 and 14. The location of the pins 63 and 64 in relation to the rotation of the cylinder and the severing of the bag-blank by the rotation of the striker-arm is such that the front clip 60 is caused to close against the pressure of the spring 66 as the leading end of the tube advances and holds the lower ply of the tube to the carrier 55, which is mounted to the cylinder 52, as shown in Figs. 1 and 2, to carry the same onward and to release the same again when the diamond form is completed. The cylinder 52 is also provided with two pairs of bevel-edged side clips—that is, with each front clip is coacting one pair of bevel-edged side clips 68, as best shown in Figs. 1, 2, 3, 8, and 9, and they are pivotally mounted on pins 69 in depending bosses 70 beneath the folding-surface of the carrier. The side clip 68 on the left-hand side of the machine is provided on its lower side with a projection engaging a cam 65, which is fastened on the bearing 22^c of the upright 22. A connecting-rod 71 (best shown in Figs. 8 and 9) couples the two clips together, whereby the same are simultaneously operated. The location of the side clips is such that the intersecting points of the edges of the bag-blank and the bevel edges of the side clips will eventually form the front corners of the completed bag-bottom and also correspond with the transverse creaser-groove 110, as will be explained hereinafter.

The stationary pins 63 and 64, that effect the movement of the front clips 60, and the stationary cam 65, that effects the movement of the side clips 68, as the cylinder revolves, are so shaped that as the advancing bottom-forming end arrives at a position as shown in Figs. 1 and 2 the front clip is caused to close, gripping the lower ply of the tucked-paper tube to the carrier. The side clips close in between the tucks and hold the lower tucks, and then as the carrier is caused to be carried around by the cylinder the same is brought toward the center of that cylinder to open and distend the tube and immediately return to its normal position.

The tucker-plate 71, provided with the folding edge 71^a, is mounted on the trunnions 72 and 73 in the stationary uprights 21 and 22 and is oscillated by means of the pinion-sector 74, rigidly connected to the trunnion 73 and meshing into the sector 75, pivotally mounted on the shaft 76, which is attached to the inner side of and adjacent to the upright 22. On the outside of the upright 22 and fastened to the shaft 76 is the upwardly-extending arm 75^a, provided with the projection 77, engaging the groove of the cam 78, which is fastened to the shaft 97 and whereby the tucker-plate is adapted to be vibrated from the normal downward position (see Figs. 1 and 10) through the arc of a circle of about one hundred and eighty degrees to the extreme upper position of Figs. 11 and 12.

The center line of the trunnions 72 and 73 coincides with a line that passes through the two points of intersection formed by the edges of the tube and the forty-five-degree edges of

the side clips. The distance from the center line of the folding edge of the tucker-plate is substantially equal to the depth of the tucks and serves to define the primary transverse folding-line across the tubular blank as the same is carried onward by the carrier.

The tucker-plate is provided with a pair of oppositely-disposed defining-fingers 80 and 81, geared together by the pinions 82 and 83, whereby they are simultaneously operated. The defining-fingers 80 and 81 are provided with the defining ends *a* and *b* and the defining edges *c* and *d*, the ends *a* and *b* being adapted to engage the outer edges on the inside of the tucks and defining the corners where the bottom of the bag is to be located, whereas the defining edges *c* and *d* lie in the folds of the diamond form when completed, as shown in Fig. 11. The defining-finger 70 is pivoted to the tucker-plate by the pivot 84, whereas its corresponding and coacting finger 81 is held on the shaft 85, extending through to the other side of the tucker-plate and to which is fastened the sector 86, meshing into the sector 87, having the downwardly-projecting arm 89 and pivotally mounted on the pivot 88. The arm 89 engages between the two flanges of the collar 90, which is laterally movable on the trunnion 72 and operated by the arm 91 on the shaft 92, journaled on a projecting hub 21^a of the upright 21. On the inner end the shaft carries the cam-arm 93, provided with the projection 94, engaging a groove of the cam 95 on the shaft 97. By the mechanism just described the defining-fingers are simultaneously operated from the position shown in Fig. 10 to the position of Fig. 11.

The timing of the groove in the cam 78 that operates the tucker-plate 71 and the timing of the groove in the cam 95 that effects the movement of the defining-fingers 80 and 81 is such that the tucker-plate is in its normal downward position and the defining-fingers brought together, so that the same may properly enter into the advancing bottom-forming end of the bag-blank. Then the fingers are simultaneously distended to their extreme limit of outer movement, the tucker-plate oscillated through the arc of a circle of about one hundred and eighty degrees, which completes the diamond form, as shown in Fig. 11, and the fingers are brought together so that the diamond-formed blank can be withdrawn, as represented in Fig. 12. The lower ply of the tube having been gripped, as previously stated, and the upper ply being held by the defining-fingers, as just described, the combined movements of these mechanisms will effect the distending and unfolding of the tucks of the tube, form the well-known inside triangular folds, and define the primary transverse folding-line across the tube by the edge of the tucker-plate, as clearly shown in the drawings, and the tubular blank is converted into the diamond form of Fig. 12.

The position of the defining-fingers is substantially such that when the same are in their extreme limit of outer movement, as shown in Fig. 11, the ends *a* and *b* coincide with the center line of the trunnions of the tucker-plate 71, and the angle formed by the defining edges is about ninety degrees. The ends of the defining-fingers produce the other corners of the bag-bottom during the process of converting the tube into the diamond form.

The paste is applied to the diamond-formed bag-bottom by the paste-sector 96, fastened to the shaft 97, journaled in the uprights 21 and 22 and carrying connected thereto the gear 98, engaging the gear 99, fastened on the shaft 100, journaled in the upright 22, and that shaft carries securely fastened thereto the paste-segment 101. The gear 99 meshes again into the gear 102, fastened on the shaft 103, to which is fastened the paste-roll 104, revolving in the paste-box 105, held on two rods 106 and 107 to the upright 22, and from which the paste is delivered to the diamond-formed bag-blank.

The gears 98, 99, and 102 are so geared in relation to the cylinder-gear 50 that the face of the paste-sector 96 comes in contact with the surface of the cylinder twice to each revolution of the cylinder, and in this manner the paste is deposited on each bag as it passes along. The folding of the rear and front flaps is accomplished as follows: The paste-sector 96 has attached thereto the two creaser-blades 108 and 109 at a distance apart, measured upon the circumference of the paster, equal to twice the depth of the tucks, which corresponds with the transverse creaser-groove 110 and 111 in the carriers. On the inwardly-projecting bearings 21^c and 22^c of the uprights 21 and 22, respectively, are mounted for oscillatory motion the arms 112 and 113, provided at the upper ends with bearings adapted to receive the folder-plate shaft 114, having attached on its outer side the sector 115, meshing into the sector 116, pivotally mounted on the stud 117, held on the arm 113. The downward extension of the sector 116 is provided with the projection 118, engaging a groove in the stationary cam 119, which is held on the bearing 22^c. The arm 113 is also provided with a sector 120, meshing into a sector 121, mounted on the stud 122, fastened in the upright 22, and that sector is provided with a projection 123, engaging a cam-groove 124 of the cam 125, securely held upon and revolving with the shaft 126. Fastened on the folder-plate shaft 114 is the folder-plate 127, provided with the folding edges 128 and 129. By the means just described the folder-plate 127 receives an oscillatory motion, caused by the arms 112 and 113, the intermediate mechanism, and the cam-groove 124, over and near the upper surface of the cylinder and the carriers and also a vibratory motion about the folder-shaft by means of the stationary cam 119. The timing of the cam-groove 124 of the cam 125 is such that the arms 112 and 113,

which carry the plate 127, are oscillated at a gradually-increasing speed, so that as soon as the plate is able to get back of the flap the oscillation begins and increases in speed and oscillates faster than the circumferential speed of the cylinder until the position shown in Fig. 6 is reached, when its speed is reduced, moving with the speed of the cylinder until the second flap is folded and delivered into the delivery-rolls 140 and 141. The supplemental carriers are also provided with two oppositely-disposed holding-fingers 130, pivotally mounted on pivots on projecting lugs of the carriers, identical in construction, arrangement, and operation with those of the side clips and clearly shown in Figs. 8 and 9, and those holding-fingers are also connected by a connecting-rod for simultaneous oscillation and operated by an arm engaging a groove of the stationary cam 131, mounted on the bearing 21^c of the upright 21, and whereby the holding-fingers are adapted to be oscillated over the folding-surface of those carriers into operative position about opposite the creaser-groove 111 and also oscillated back to open adjustment out of engagement, as clearly shown in Figs. 1 and 3. The only difference between the side clips and the holding-fingers 130 is in their shape, which rises over the carriers, the side clips having that portion beveled, whereas the holding-fingers are cylindrical and have rounded ends. As a convenient means for delivering the completed bag I have arranged the delivery-plate 134, fastened on the stud 135, held to the uprights, and which prevents the bag from being forced out of its line of motion. The flap-bar 137 is securely held to the uprights, and as the front clip is caused to be opened the front of the bag springs away from the carrier over the flap-bar 137, thereby enabling the folding-plate 127 to complete its function, as represented in Figs. 6 and 7. The upper delivery-rolls 138 and 139 are respectively fastened to shafts 140 and 141, journaled in the uprights and carrying on their outer sides the gears 142 and 143, the latter meshing into the gear 144, loosely mounted on the stud 145, and that gear meshes into the lower delivery-gear 146 on the shaft 147, to which the lower small delivery-roll 148 is fastened. The gear 146 meshes again into the large lower delivery-gear 149, which engages the gear 27 and wherefrom the motion is communicated. The gear 149 is fastened on the shaft 126, to which the large lower delivery-roll 150 is secured, as clearly shown in Fig. 1.

The operation of the machine is as follows: The paper, of proper width to manufacture the desired bag, is taken from the roll at the base of the machine, folded around the former, (not shown in the drawings,) and converted into a continuous tucked-paper tube, which is guided into the bite of the drawing-rolls 38 and 41 under the serrated knife 46 and between the rolls 30 and 33, and as the striker-arm 45 revolves across the path of the tube it forces the tube against the serrated edge of the knife 46 and the float 46^a and severs the blank therefrom at each revolution. The drawing-rolls are so geared in relation to the rotation of the striker as to feed through a suitable length for each rotation thereof. The bottom-forming end of the tube is then guided into the bottom-forming mechanism in such a manner that the upper ply enters between the tucker-plate 71 and the defining-fingers, so that the defining-fingers enter into the mouth of the tube on one side, whereas on the other side the tube is gripped to the supplemental carrier 55 by the front clip 60 and the two oppositely-disposed bevel-edged side clips 68. The tube as it arrives at about the position shown in Figs. 1 and 2 is clasped by the front clip 60, the same being caused to be closed by the cylinder revolving and by virtue of the pin 63, and the side clips 68 are also then caused to be closed by means of the cam 65, thus holding the lower part of the tube to the supplemental carrier. Simultaneously the defining-fingers are caused to be moved to their extreme outer limit of movement by means of the cam-groove in the cam 95, and as the cylinder continues to rotate the supplemental carrier is swung away from the tucker-plate. At the same time the tucker-plate is vibrated, the defining edge 71^a forming the primary transverse folding-line across the tubular blank and defining the well-known inside triangular folds, converting the tubular blank into the diamond form of Figs. 11 and 12. The bag-blank is then carried onward by the revolving cylinder to the paste-sector 96, which applies the paste and creases the blank by the engagement of the creaser-blades 108 and 109, coöperating with the creaser-grooves 110 and 111 in the carrier, thereby raising the rear flap slightly from the carrier. The holding-fingers 130 are then thrust into their inner adjustment, and the folding-plate 127 is then vibrated, whereby the folding edge 128 engages the rear flap, and as the folding-plate is then caused to be turned it effects the folding of the rear flap over the holding-finger 130. The front clip 60 and the bevel-edged side clips 68 are then released, thereby allowing the front end of the blank to spring forward over the flap-bar 137, and as the folding-plate continues to be turned about the shaft 114 the folding edge 129 engages in the crease formed by the creaser 109 and its coacting groove 110 and turns over the front flap and delivers the completed bag into the bite of the delivery-rolls 138 and 139.

Having thus fully described my invention, what I claim is—

1. The combination of a conveyer, an oscillating carrier having its rearward end pivoted to the conveyer, mechanism for oscillating the carrier upon its pivot, devices for holding the lower ply of a tucked-paper tube upon the face of the carrier, the tucker-plate,

defining-fingers adapted to enter into the tucked tube and operate upon the inside edges of the tube, all combined and operating to unfold the blank into the diamond form during the forward movement of the conveyer and during the oscillation of the carrier, substantially as described.

2. The combination of a conveyer, an oscillating carrier having its rearward end pivoted to the conveyer, mechanism for oscillating the carrier upon its pivot, devices for holding the lower ply of a tucked-paper tube upon the face of the carrier, the tucker-plate, means for oscillating the tucker-plate upon its trunnions 72 and 73, defining-fingers adapted to enter into the tucked-paper tube and operate upon the inside edges of the tube, all combined and operating to unfold the blank into the diamond form during the forward movement of the conveyer and during the oscillation of the carrier, substantially as described.

3. The combination of a conveyer, an oscillating carrier having its rearward end pivoted to the conveyer, the cam for oscillating the carrier upon its pivot, devices for holding the lower ply of the tucked-paper tube upon the face of the carrier, the tucker-plate, means for oscillating the tucker-plate upon its trunnions, the defining-fingers adapted to enter into the tucked tube provided with the defining ends to operate upon the inside edges of the tube, all combined and operating substantially as described, so that during the forward movement of the conveyer and the oscillation of the carrier, the ends of the defining-fingers are in substantial alinement with the center of the trunnions of the oscillating tucker-plate, substantially as described.

4. The combination of a conveyer, an oscillating carrier having its rearward end pivoted to the conveyer, the cam for oscillating the carrier upon its pivot, devices for holding the lower ply of the tucked-paper tube upon the face of the carrier, the tucker-plate, means for oscillating the tucker-plate upon its trunnions, the defining-fingers adapted to enter into the tucked tube provided with the defining ends to operate upon the inside edges of the tube, means for vibrating the defining-fingers, all combined and operating substantially as described, so that during the forward movement of the conveyer and the oscillation of the carrier, the ends of the defining-fingers are in substantial alinement with the center of the trunnions of the oscillating tucker-plate, substantially as described.

5. The combination of a conveyer, an oscillating carrier having its rearward end pivoted to the conveyer, the cam for oscillating the carrier upon its pivot, devices for holding the lower ply of the tucked-paper tube upon the face of the carrier, the tucker-plate, means for oscillating the tucker-plate upon its trunnions, the defining-fingers adapted to enter into the tucked tube provided with the defining ends to operate upon the inside edges of the tube, means for vibrating the defining-fingers, consisting of the cam 95 and its intermediate mechanism so that when the bottom-forming end of the bag-blank enters between the tucker-plate and the carrier, the defining-fingers close together, and during the oscillation of the tucker-plate and the vibration of the carrier, the defining-fingers are spread to their outer adjustment, substantially as described.

6. In a paper-bag machine, comprising in combination, the conveyer, an oscillating carrier having its rearward end pivoted to the conveyer, mechanism for oscillating the carrier upon its pivot, the front clip and the bevel-edged side clips adapted to hold the lower ply of a tucked-paper tube upon the face of the carrier, the tucker-plate, means for oscillating the tucker-plate upon its trunnions, the defining-fingers provided with the defining ends adapted to operate upon the inside edges of the tube, means for vibrating the defining-fingers, consisting of the cam 95 and its intermediate mechanism, so that when the bottom-forming end of the bag-blank enters between the tucker-plate and the carrier, the defining-fingers close together, all combined and operating substantially as described, so that during the forward movement of the conveyer and the oscillation of the carrier, the ends of the defining-fingers are in substantial alinement with the center of the trunnions of the oscillating tucker-plate.

7. In a paper-bag machine, comprising in combination, the conveyer, an oscillating carrier having its rearward end pivoted to the conveyer, mechanism for oscillating the carrier upon its pivot, the front clip and the bevel-edged side clips adapted to hold the lower ply of a tucked-paper tube upon the face of the carrier, the tucker-plate, means for oscillating the tucker-plate upon its trunnions, the defining-fingers provided with the defining ends adapted to operate upon the inside edges of the tube, means for vibrating the defining-fingers, consisting of the cam 95 operating the laterally-sliding collar 90, the sectors 86 and 87 and the pinions 82 and 83, so that when the bottom-forming end of the bag-blank enters between the tucker-plate and the carrier, the defining-fingers close together, all combined and operating substantially as described, so that during the forward movement of the conveyer and the oscillation of the carrier, the ends of the defining-fingers are in substantial alinement with the center of the trunnions of the oscillating tucker-plate.

8. In combination, the tucker-plate 71 provided with the defining edge 71^a, actuating mechanism for operating the tucker-plate, trunnions 72 and 73 mounted in the uprights upon which the tucker-plate is mounted, defining-fingers 80 and 81 mounted upon the tucker-plate, pinions 82 and 83 and sectors 86 and 87, and a laterally-sliding collar and means for operating the collar, all combined and operating as set forth.

9. In a paper-bag machine, comprising in combination, a rotating bed, mechanism for holding a paper-bag blank to that bed, the folder-blade provided with a vibratory motion for vibrating over and near the surface of the bed, and mechanisms for turning that folder-blade substantially as described for performing the two successive steps of folding the rear flap and the front flap substantially as described.

10. The combination of a rotating bed, mechanism for holding a paper-bag blank to that bed, the folder-blade provided with a vibratory motion to vibrate over and near the surface of the bed and traveling at a faster rate than the bed to turn over the rear flap, and mechanism for turning that folding-blade to perform the two successive steps in the folding of the rear flap and the front flap by the folding-blade, substantially as described.

11. The combination of a rotating bed, mechanism for holding a paper-bag blank to that bed, the folder-blade provided with the folding edges 128 and 129 and adapted to receive a vibratory motion to vibrate at an increased speed over and near the surface of the bed, and mechanism for turning the folding-blade, all combined and operating to perform the two successive foldings of the rear and front flaps substantially as described and as set forth.

12. In a paper-bag machine, comprising in combination, a rotating bed, mechanism for holding a paper-bag blank to that bed, the folder-blade provided with a vibratory motion for vibrating over and near the surface of the bed, and mechanism for turning that folder-blade substantially as described, the flap-bar 137, the delivery-rolls 138 and 139 combined and operating to turn the two flaps and deliver the completed bag into the delivery-rolls substantially as described.

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Witnesses:
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