J. D. KING & H. IRVING.

PAPER BAG MACHINE.

APPLICATION FILED MAR. 9, 1911.

1,030,783.

Patented June 25, 1912.

5 SHEETS—SHEET 1.

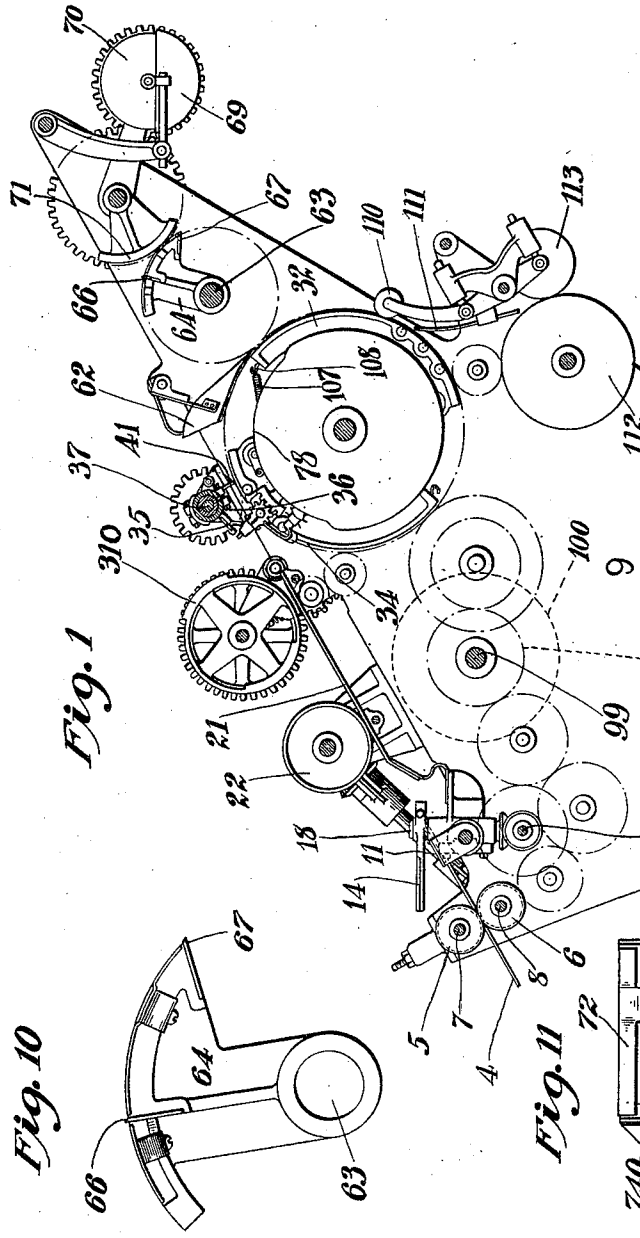

Fig. 1

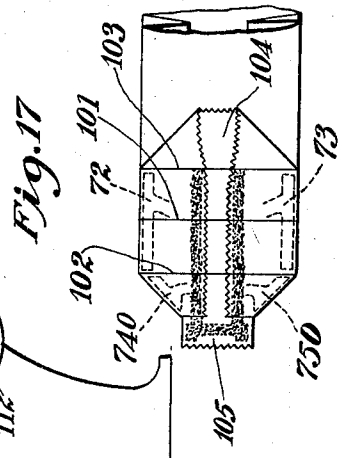

Fig. 17

Fig. 10

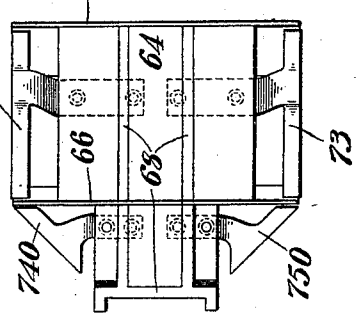

Fig. 11

Witnesses:

Louis B. Fischler

Chas W. La Rue

Inventors:

James D. King

Henry Irving

by Wilbur M. Stone

Attorney

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5 SHEETS—SHEET 2.

Fig. 2

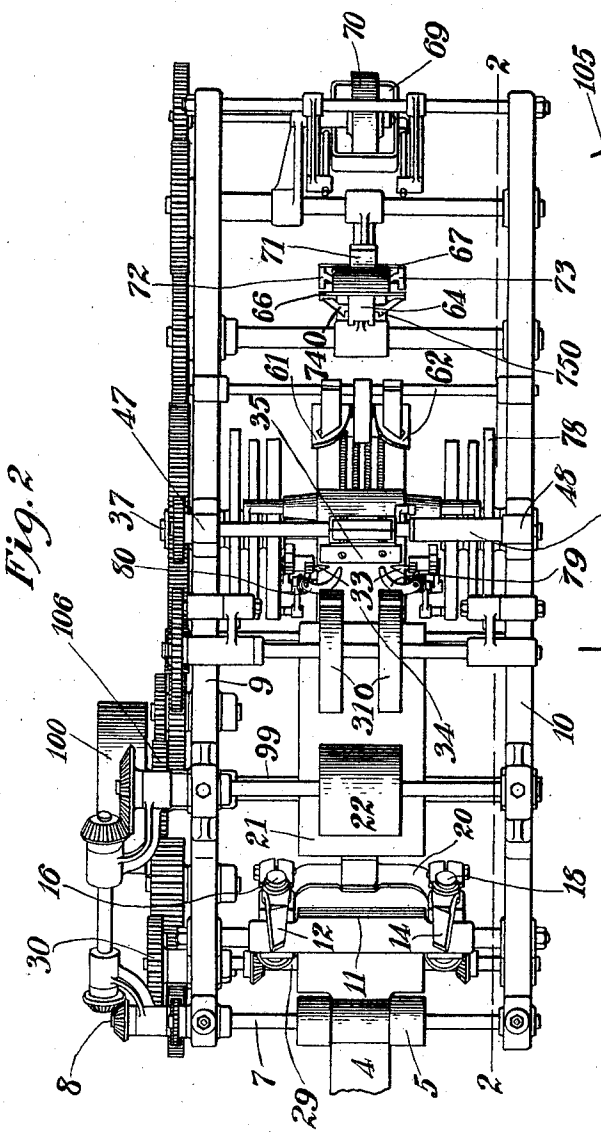


Fig. 20

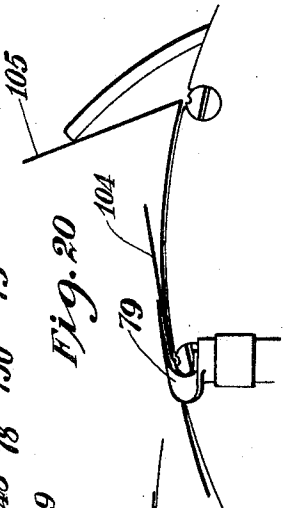


Fig. 19

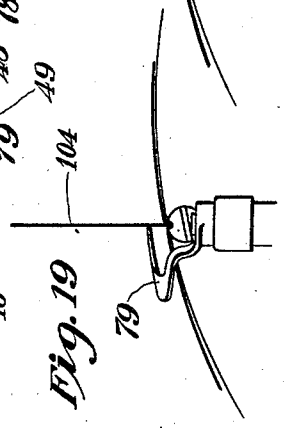
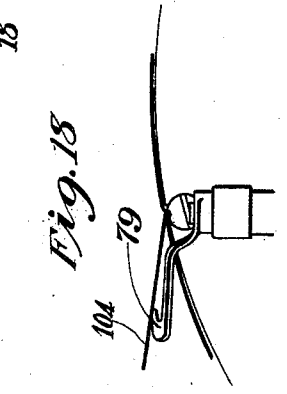


Fig. 18



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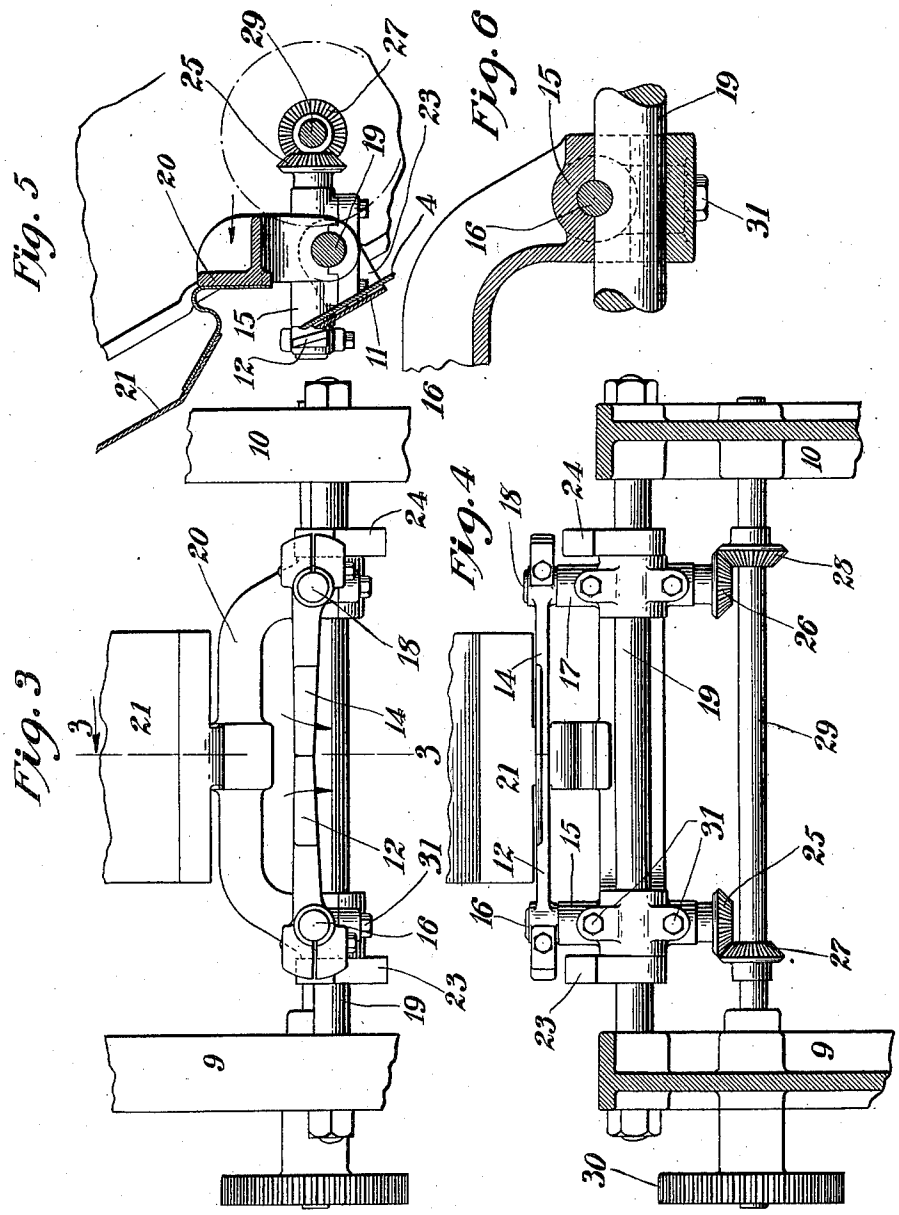

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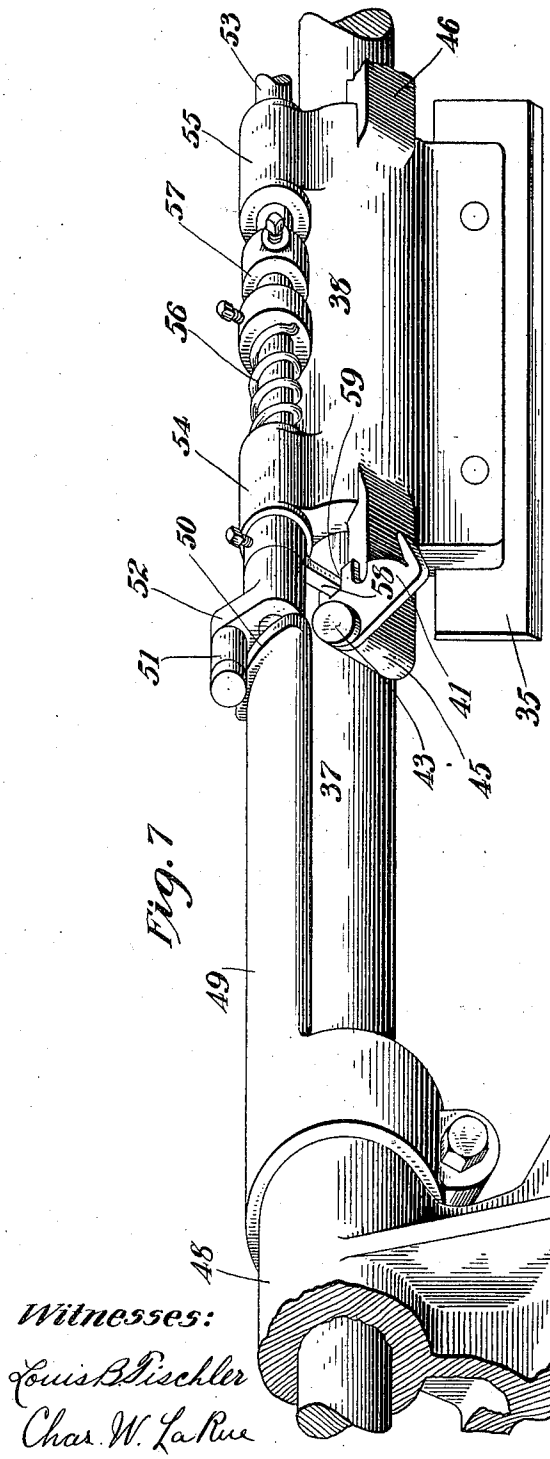

Fig. 7

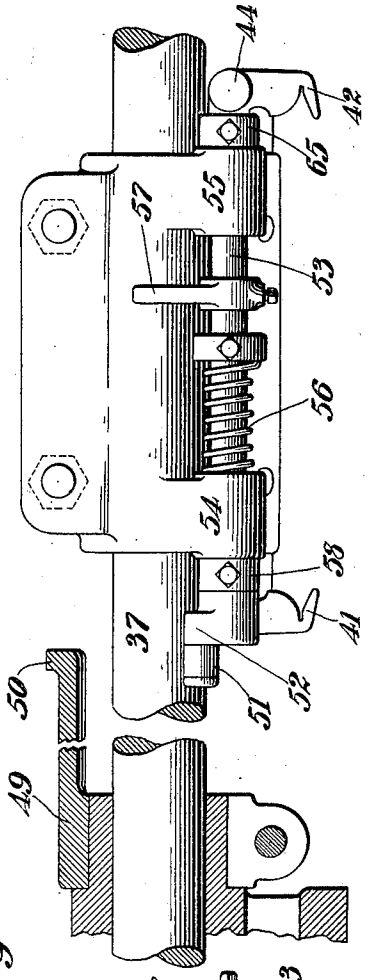

Fig. 8

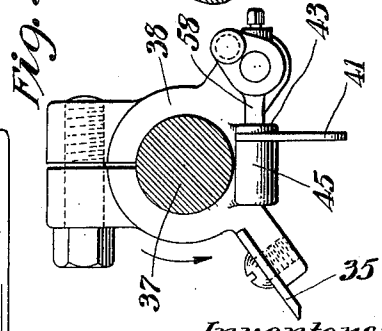

Fig. 9

Witnesses:

Louis B. Fischler

Chas. W. La Rue

Inventors:

James D. King

Henry Irving

by Wilbur M. Stone

Attorney

J. D. KING & H. IRVING.

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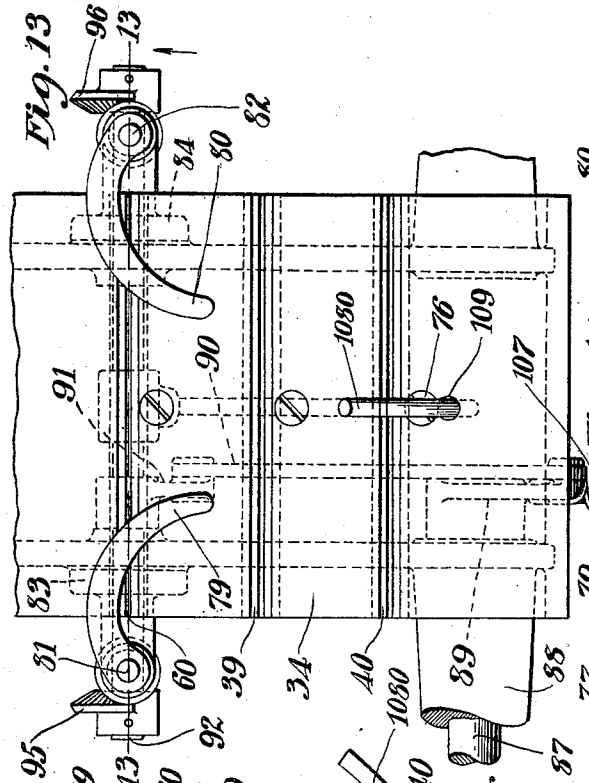

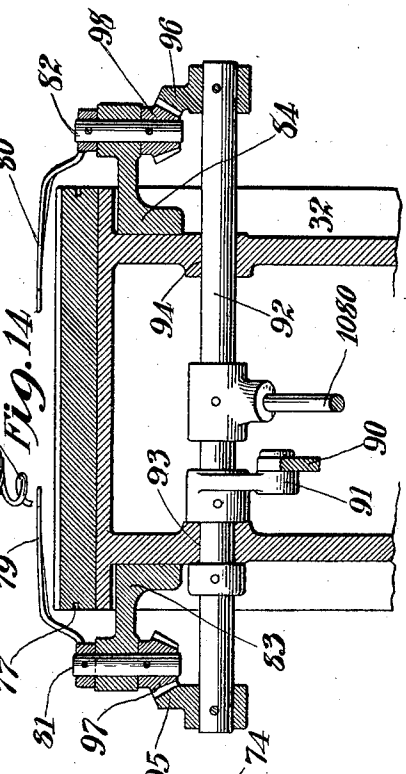

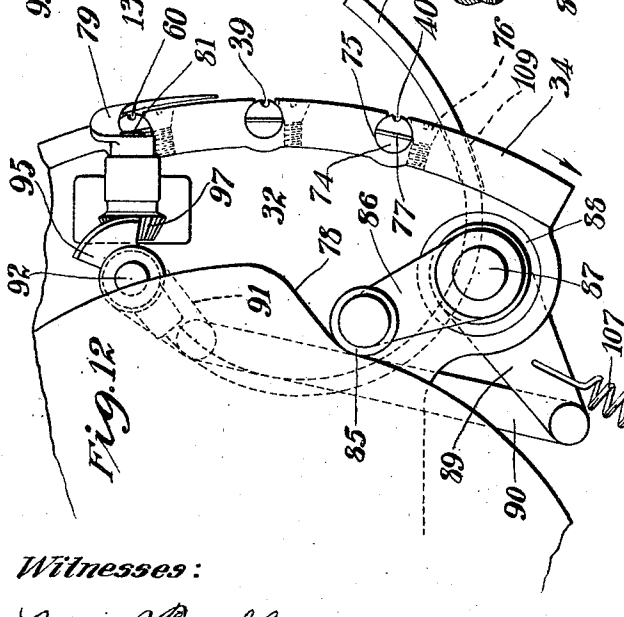

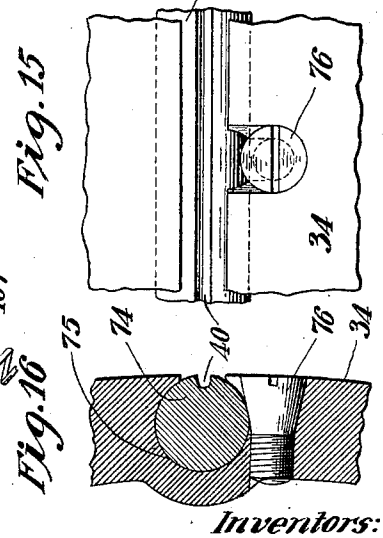

Witnesses:

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Chas. W. LaRue

Inventors:

James D. King

Henry Irving

by Wilbur M. Stone

Attorney

UNITED STATES PATENT OFFICE.

JAMES D. KING AND HENRY IRVING, OF NEW YORK, N. Y., ASSIGNORS TO CONTINENTAL PAPER BAG COMPANY, OF NEW YORK, N. Y., A CORPORATION OF MAINE.

PAPER-BAG MACHINE.

1,030,783. Specification of Letters Patent. Patented June 25, 1912.

Application filed March 9, 1911. Serial No. 613,412.

To all whom it may concern:

Be it known that we, JAMES D. KING and HENRY IRVING, citizens of the United States, and residents of New York, said KING in the county of Kings and said IRVING in the county of New York, State of New York, have invented certain new and useful Improvements in Paper-Bag Machines, of which the following is a specification.

This invention relates to paper bag machines and particularly to that class thereof which are adapted for making from paper tubing having an inwardly folded tuck in each side thereof self opening square paper bags of well known character.

The object of our improvements is to provide a machine of the class described particularly adapted for the rapid and accurate manufacture of paper bags of large size.

To these ends our improvements comprise mechanisms and combinations described and claimed herein and illustrated in their preferred form in the drawings accompanying this specification.

Figure 1 of the drawings is a sectional side elevation on line 2—2 of Fig. 2. Fig. 2 is a plan view corresponding with Fig. 1. Fig. 3 is a plan view of the tube severing mechanism; Fig. 4 is a front elevation thereof; Fig. 5 is a sectional elevation on line 3, 3, of Fig. 3 and Fig. 6 is a sectional view of a detail of what is shown in Figs. 3, 4 and 5. Fig. 7 is a perspective view of a portion of the tube opening mechanism; Fig. 8 is a plan view and Fig. 9 is an end view thereof. Fig. 10 is an end view of the yieldable ironers and Fig. 11 is a plan view thereof. Fig. 12 is a side view of the rear flap folders and of a portion of the creasing mechanism; Fig. 13 is a plan view thereof and Fig. 14 is a sectional elevation on line 13, 13 of Fig. 13. Figs. 15 and 16 are respectively plan and sectional views of a detail of the creasing mechanism. Fig. 17 is a plan view of a diamond folded bag blank. Figs. 18, 19 and 20 are diagrammatic side views illustrating steps in the operation of the rear flap folders.

The construction of machinery for the production of large sized bags, such for instance as those commonly denominated 16 lb. bags and up to 25 lb. bags, involves much more than the simple proportional enlargement of machines on which are successfully and rapidly made small sized bags, such for instance as 2 lb. bags or 4 lb. bags; in that instance, many moving parts of such succcessful small machine would have to be so increased in size and therefore in weight as to make their operations at commercially desirable speeds, impracticable. In large machines it is therefore necessary to materially modify many parts to adapt them to successful use. Our improvements are directed, in several of their features, particularly to machines for making such large sized bags.

The paper bag machine which we have illustrated as embodying our improvements is in general of well known character and the tucked paper tube from which the bags are to be formed is led into the machine about float 4 by means of the usual feed rolls 5, 6 fixed to shafts 7, 8 respectively revolubly mounted in side frames 9, 10. Said feed rolls 5, 6 deliver said bag tube over the end of float 4 under fixed knife 11 where the lower plies of said tube are severed against the end of said float and the upper ply of said tube is severed against knife 11 by means of simultaneously coacting strikers 12, 14. Said strikers are pivotally mounted at opposite sides of float 4 and are actuated to rotate continuously in opposite directions as indicated by their arrows, Fig. 3. Said strikers are of such length that their free ends just meet at their instant of engagement with the bag tube whereby a continuous line of severance is had across said tube. We preferably slightly incline the faces of said strikers so that at their time of meeting (Fig. 3) the severing of the bag tube will be from each edge inwardly toward the center. Said strikers are fixed to shafts 16, 18 revolubly mounted in sleeves 15, 17 respectively and said sleeves are clamped to rod 19 fixed in side frames 9, 10. Said shafts 16, 18 cut into rod 19 as shown in Fig. 6 which is a sectional end view of shaft 16 and the parts in its immediate vicinity. The direction of the view of Fig. 6 is indicated by the arrow

in Fig. 5. Sleeve 15 is clamped to rod 19 by means of clamp screws 31, 31 and sleeve 17 by means of similar clamp screws. Said sleeves 15, 17 are connected by frame 20 on which is supported table 21 forwardly and upwardly over which the severed bag blank passes under feed roll 22. Ears 23, 24 reach upwardly from sleeves 15, 17 respectively to support knife 11. Shafts 16, 18 have fixed to their lower ends bevel gears 25, 26, driven by bevel gears 27, 28 respectively fixed to shaft 29 rotatably mounted in bearings in side frames 9, 10. Said shaft 29 has gear 30 fixed to that end thereof outboard frame 9 and said gear is driven from the usual train (Figs. 1 and 2) at a suitable speed to time the strikers with the bag tube. As the bag blank is advanced by roll 22 over table 21 intermittent feed roll 310 engages and delivers said blank at an increased speed to and in time with one of the folding beds as 34 of rotative carrier 32. The usual side grippers 33, 33 thereupon clamp said blank to the folding-bed as 34 in coaction with the usual front clip not shown and creaser blade 35 revolubly mounted on shaft 37 coacts with creaser groove 39 in folding-bed 34 to form the main transverse crease 101, Fig. 17, in the bag blank.

Referring now more particularly to Figs. 7, 8 and 9 we have there illustrated means for lifting the upper plies of the side tucks of the leading end of the bag blank to facilitate and insure the accurate operation of the gripping means of the diamond folding mechanism. Said folding mechanism is indicated in a general way by 36, Fig. 1. Said side tuck lifting means comprises opposite hooks 41, 42 pivoted at 43, 44 in brackets 45, 46 extending to the left and right all respectively, from creaser head 38. Shaft 37 is revolubly mounted in brackets 47, 48 fixed to side frames 9, 10 respectively and arm 49 is clamped to bracket 48 and has cam 50 inreaching therefrom for engagement with roll 51 of rock arm 52 fixed to shaft 53. Said shaft 53 is revolubly mounted in ears 54, 55 on creaser head 38 and is urged in an anti-clockwise direction Fig. 7 by spring 56. Stop arm 57 is fixed to shaft 53 for engagement with creaser head 38. Arm 58 fixed to shaft 53 engages notch 59 of hook 41 to swing said hook on its pivot. Hook 42 is similarly engaged by arm 65 fixed to shaft 53 to swing said hook 42 inwardly in unison with the inward swing of hook 41. Said hooks 41, 42 rotate with shaft 37 into operative position just before creaser 35 engages the blank; said hooks thereupon swing inwardly toward each other gripping the upper plies of the opposite side tucks respectively and as said shaft 37 rotates in an anti-clockwise direction lift said upper plies. Immediately following, creaser 35 engages the blank and in coaction with creaser groove 39 forms main transverse crease 101, Fig. 17 across the blank. Whereupon the gripping means of the diamond folding mechanism engages and folds over backwardly the upper plies of the blank to form the diamond fold in the well-known manner. Said diamond folded blank then passes onwardly under fixed ironers 61, 62 which partially lay the diamond fold and especially the rear flap 104 thereof against the folding bed. The diamond folded blank is then carried rotatively onwardly on said folding-bed and is engaged by member 64 rotatively fixed on shaft 63 having bearings in side frames 9, 10. Said member 64 is best shown in Figs. 10 and 11 and comprises first, transverse creasing blades 66, 67 for coaction with creasing grooves 40, 60 respectively in each folding-bed as 34, for forming the usual creases 102, 103 Fig. 17 on which the end flaps of the diamond are later folded over in the formation of the bag bottom; second, pasting segment 68 which receives paste from the usual receptacle 69 by means of disk 70 and transfer segment 71; and third, spring supported ironing blades 72, 73 and 740, 750. Creasing blades 66, 67 are of well known character but the construction and mounting of the creasing groove members as 74 are novel and peculiar. Creasing groove 40 is formed lengthwise in cylindrical rod 74 seated in cylindrical channel 75 crosswise folding-bed 34 and said rod is approximately tangent to said cylinder. One or more tapered binding screws as 76 are provided to engage said rod 74 tangentially for holding it against turning and against endwise movement. By loosening said screws 76, rod 74 may be adjusted circumferentially to position groove 40 therein relative to its coacting blade 66. For rotating said rod a slot as 77 is provided in either end thereof for the reception of a screw driver blade.

For folding the end flaps 104, 105 to form the bag bottom we provide the following means mounted upon and traveling with the folding-bed. The rear flap 104 is first folded over in the direction of the travel of the bag blank by means of folding fingers 79, 80 fixed on shafts 81, 82 pivotally mounted in brackets 83, 84 respectively, on opposite sides of folding-bed 34. Said fingers are oscillated by fixed cam 78 through roll 85 on arm 86 fixed to rock shaft 87 pivotally mounted in sleeve 88 in carrier 32 under the forward end of folding-bed 34. Roll 85 may be urged to engagement with cam 78 by means of spring 107, one end of which is fixed to arm 89 and the other end to hook 108 in carrier 32. Said arm 89 is fixed on the inner end of shaft 87 and connected by

link 90 with arm 91 fixed to rock shaft 92 pivotally mounted in bearings 93, 94 in carrier 32 under folding-bed 34 and directly below shafts 81, 82. Said rock shaft 92 has fixed to its outboard ends, segment bevel gears 95, 96 driving bevel gears 97, 98 on the lower ends of finger shafts 81, 82 all respectively. Fingers 79, 80 are mounted to oscillate in approximately parallelism with said folding-bed, but we preferably mount them so that in their forward movement their points will approach nearer and nearer said bed. Thus said fingers will enter behind rear flap 104 uplifted by the previous action of creaser blade 67 (Fig. 18), raise that flap normal to the folding-bed (Fig. 19) and then fold it over and down closely onto the body of the bottom (Figs. 12, 13 and 20) and hold it there until the front flap is folded thereonto.

We are aware that rotatable rear flap folders mounted on axes stationary relative to the rotating folding-beds have heretofore been used but the time allowed for their coaction with the bag blank is necessarily very brief, while with our improved folders traveling with the folding-bed ample time for their operation is secured and the rear flap is retained in its folded position thereby as long as desired.

The mechanism which we preferably employ for folding the front flap is of well known character comprising curved finger 1080 fixed to rock shaft 92 and having its free end projecting upwardly through aperture 109 in folding-bed 34. Said finger holds end flap 105 in a partially folded condition (Figs. 12, 13 and 20) until ironing roll 110 engages said flap and folds it down thereby completing the bottom. Said bag is then delivered between guide 111 and ironing roll 110 and thence to rolls 112 and 113 whereby it is discharged from the machine.

The various moving parts of the machine are driven from the usual pulley 100 fixed to main shaft 99. Said shaft has also fixed thereto gear 106 which through the usual trains of gearing transmits properly timed movement to the several moving parts. Said trains of gearing being of well known character and mode of operation detailed description thereof is considered unnecessary.

We claim:—

1. A paper bag machine including in combination, a rotatable folding-bed, means for holding a bag-blank thereon, creasing means in said folding-bed comprising a transverse channel in said bed, a cylindrical member in said channel, a creasing groove in the cylindrical member, said cylindrical member being rotatable for shifting the creasing groove lengthwise the periphery of said folding-bed, and a binding screw for tangentially engaging the periphery of said movable member for holding it in any rotative position relative to said folding-bed.

2. A paper bag machine including in combination a rotatable folding-bed, means for holding a bag blank thereon, creasing means in the folding-bed, comprising a transverse channel in said bed, a rotatable cylindrical rod in said channel, a creasing groove in the rod and a tapered binding screw for tangentially engaging the periphery of said rod for holding it in any rotative position relative to said folding-bed.

3. Creasing means including in combination, a rotatable cylindrical rod, a creasing member lengthwise thereof and binding means for tangentially engaging the periphery of said rod for holding it in any chosen rotative position.

4. A paper bag machine including in combination, a rotatable folding-bed, means for holding a bag blank thereon, a rotatable member above the folding-bed, and oppositely disposed yieldable angular ironing blades mounted on said rotatable member.

5. A paper bag machine including in combination, a rotatable folding-bed, means for holding a bag blank thereon, a rotatable member above the folding-bed, a pair of oppositely disposed yieldable angular ironing blades and a pair of oppositely disposed yieldable parallel ironing blades mounted on said rotatable member.

6. A paper bag machine including in combination, a rotatable folding-bed, means for holding a bag blank thereon, a rotatable member above the folding-bed, a pasting segment mounted thereon, one or more creasing blades therein and oppositely disposed yieldable ironing blades mounted on said rotatable member.

7. A paper bag machine including in combination, a rotatable folding-bed, means for holding a bag blank thereon, a rotatable member above the folding-bed, a creasing blade mounted thereon, a pair of oppositely disposed hooks pivotally mounted on said rotary member for movement toward and from each other and means for actuating said hooks; a second rotatable member above the folding-bed and oppositely disposed yieldable ironing blades mounted on said rotatable member.

8. A paper bag machine including in combination, a rotatable folding-bed, means for holding a bag blank thereon, a rotatable member above the folding-bed, oppositely disposed yieldable angular ironing blades mounted on said rotatable member, a pair of oppositely disposed flap folding fingers mounted for oscillation approximately parallel with said folding-bed and means for oscillating said fingers in opposite directions.

9. Creasing means including in combination, a rotary member having a cylindrical periphery, a cylindrical rod mounted for free rotation in and tangent to said rotatable member, a creasing member in said rod and binding means for tangentially engaging the periphery of said rod for holding it in any chosen rotative position.

Signed this 7th day of March nineteen hundred and eleven (1911) before two subscribing witnesses.

JAMES D. KING.
HENRY IRVING.

Witnesses:
WILBUR M. STONE,
CHAS. W. LA RUE.