P. J. GAGNON, JR.

BAG TURNING MACHINE.

APPLICATION FILED APR. 19, 1918.

1,308,944.

Patented July 8, 1919.

3 SHEETS—SHEET 1.

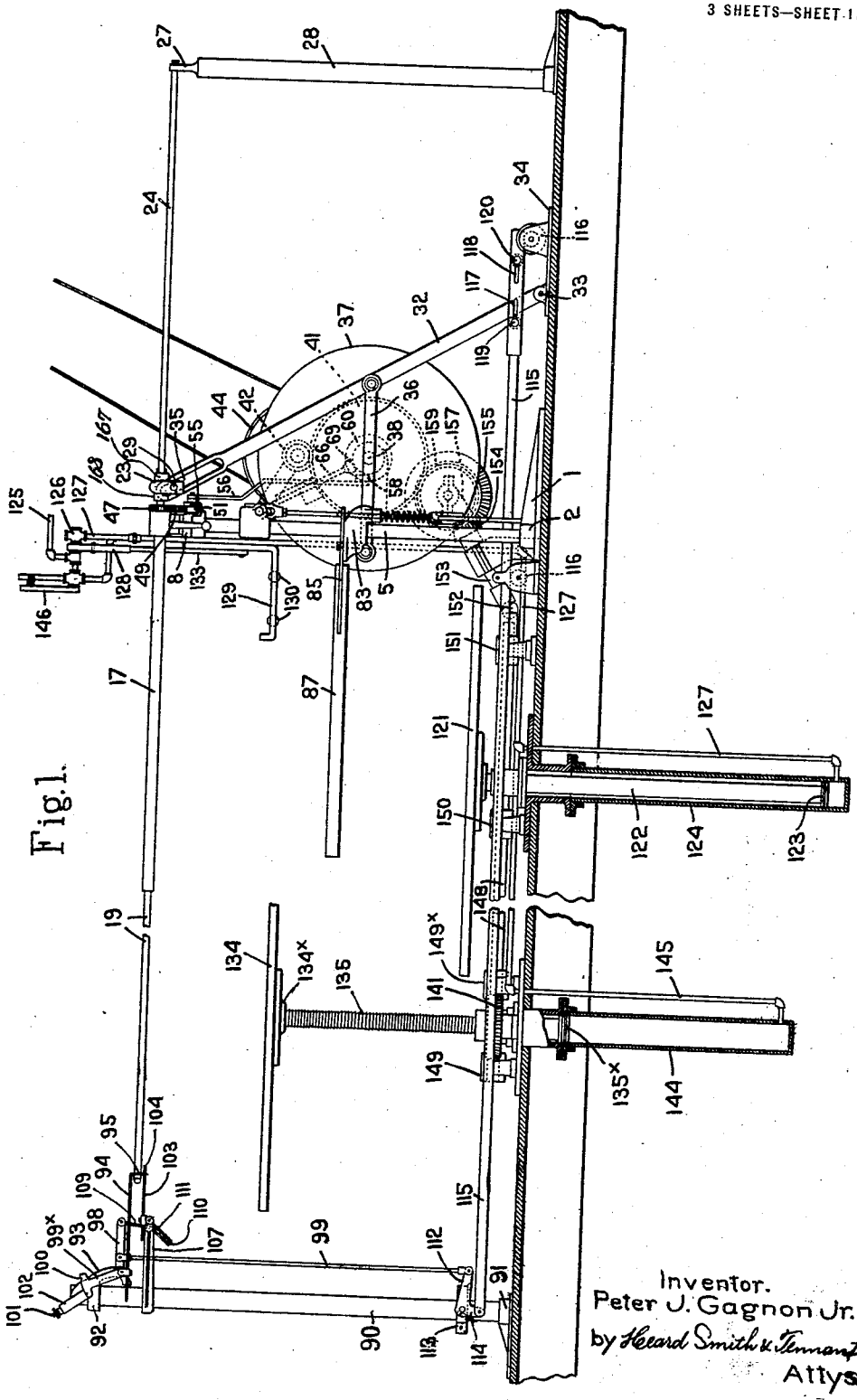


Fig. 1.

Inventor.
Peter J. Gagnon Jr.
by Heard Smith & Tennant.
Attys.

P. J. GAGNON, JR.

BAG TURNING MACHINE.

APPLICATION FILED APR. 19, 1918.

1,308,944.

Patented July 8, 1919.

3 SHEETS—SHEET 2.

Fig. 2.

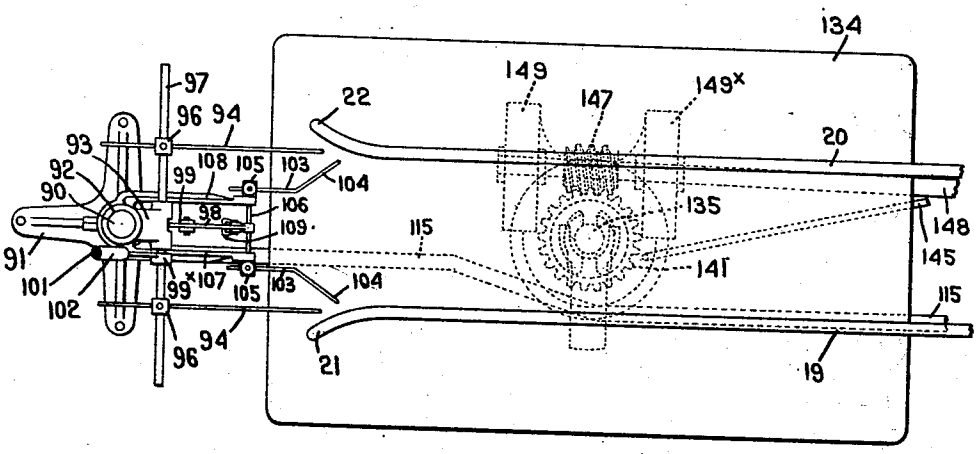
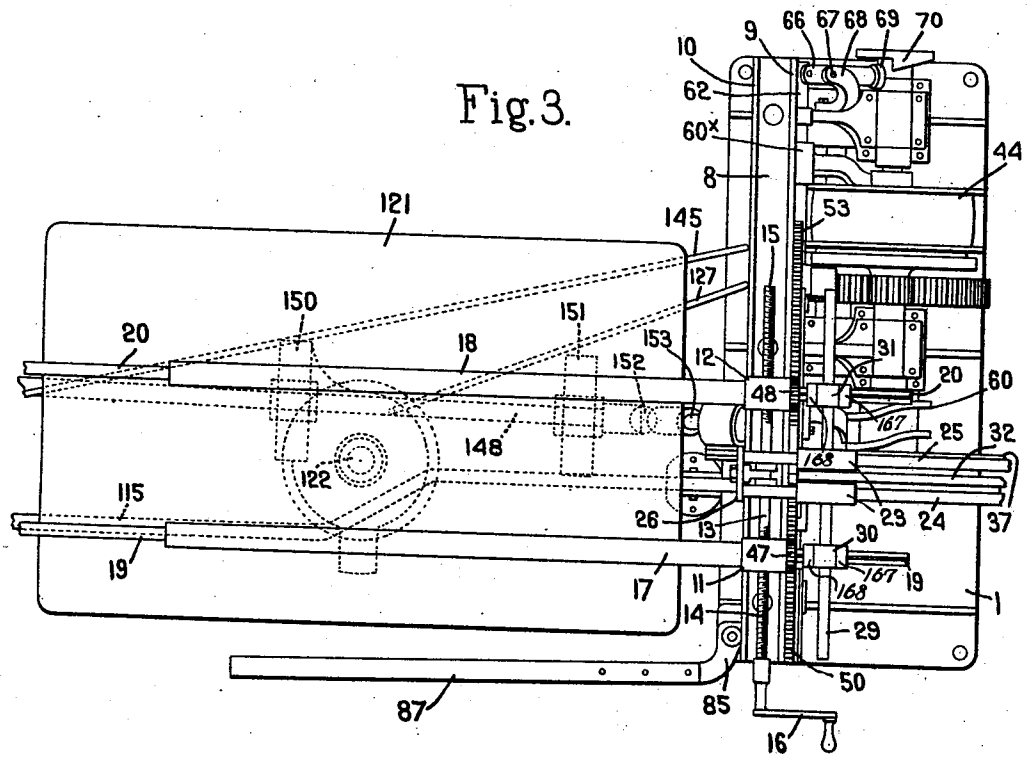


Fig. 3.



Inventor.
Peter J. Gagnon Jr.
by Heard Smith & Tennant.
Attys.

THE COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

P. J. GAGNON, JR.
BAG TURNING MACHINE.
APPLICATION FILED APR. 19, 1918.

1,308,944.

Patented July 8, 1919.
3 SHEETS—SHEET 3.

Fig. 5.

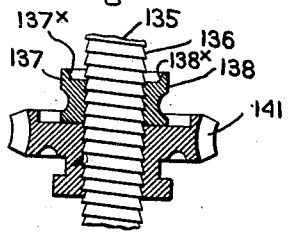
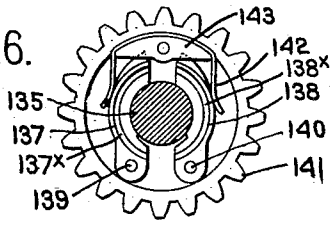


Fig. 4.

Fig. 6.



Inventor.
Peter J. Gagnon Jr.
by Heard Smith & Tennant.
Attys.

UNITED STATES PATENT OFFICE.

PETER J. GAGNON, JR., OF SOUTH LOWELL, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO RALPH A. WILSON, OF LOWELL, MASSACHUSETTS.

BAG-TURNING MACHINE.

1,308,944. Specification of Letters Patent. Patented July 8, 1919.

Application filed April 19, 1918. Serial No. 229,540.

To all whom it may concern:

Be it known that I, PETER J. GAGNON, Jr., a citizen of the United States, and resident of South Lowell, county of Middlesex, State of Massachusetts, have invented an Improvement in Bag-Turning Machines, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates to improvements in bag turning machines and the object thereof is to provide a machine which may be adjusted to turn bags of different widths and in which the bag turning members will more readily enter a positioned bag and which may be more easily withdrawn from the bag thus making it easier for the operator and thereby enabling a larger number of bags to be turned per day.

Another object of the invention is to provide means for rotating two or more reciprocable bag turning members during the advancing movement or the advancing and retracting movements whereby the turning of the bag will be facilitated.

A further object of the invention is to provide means for relatively adjusting the reciprocable and rotary bag turning members to permit the turning of bags of different widths and lengths.

A further object of the invention is to provide novel means for gripping the bag while the bag turning members are being withdrawn with means for actuating the same which may be adjusted to permit the turning of bags of different widths and lengths.

A further object of the invention is to provide a novel bag receiving means upon which the turned bags may be dropped with means for actuating said receiving means to lower the pile of bags as the same are built up, so that the uppermost bag will be at all times at substantially the same level.

Another object of the invention is to provide a supporting means for the bags to be turned with means for automatically operating the same to maintain the uppermost bag in substantially the same position relatively to the bag turning members and within convenient reach of the operator.

Another object of the invention is to provide a stop mechanism which will be certain and effective in its operation and in which the shock due to sudden starting and stopping will be reduced to a minimum.

Other objects and features of the invention will more fully appear from the following description and the accompanying drawings and will be pointed out in the annexed claims.

The preferred embodiment of the invention illustrated in the accompanying drawings comprises certain improvements upon the bag turning mechanism disclosed in my prior Patent No. 1,171,034 in which a pair of parallel reciprocating bag turning members are caused to enter the mouth of a positioned bag and in traversing the same to turn it inside out. In the operation of that machine, the operator grasps the mouth of the bag and reverses, or folds back, the edge thereof over his thumbs in such a manner as to present the reversed portion to the ends of the advancing bag turning members, and continues to hold the bag until the turning operation is completed. Automatically operable means are provided to grip the bag at the limit of the advancing movement of said turning members and hold the bag during their retraction, the turned bags being deposited upon a table which is carried by a standard supported by a fluid under pressure. In that device the bag turning rods were reciprocated in parallelism and spaced apart substantially the width of the bag so that it was necessary for the operator to spread the top of the bag to its full width when placing it upon the bag turning means.

In the present invention reciprocable bag turning means of substantially the same character are used but means are provided for rotating them in opposite directions so that their bag engaging surfaces will tend to draw the bag upon them. Preferably the ends of said members are offset so that when the bag turning members are in retracted position the ends converge, then as the members are moved forward to engage the bag and the converging ends have entered the bag said members are rotated to reverse position, thereby spreading the bag and causing the ends to follow the seams of the bag to the corners, thus insuring the turning of the corners of the bag.

A preferred embodiment of the invention is illustrated in the drawings, in which—

Figure 1 is a side elevation showing more

or less diagrammatically the assembled construction of a bag turning machine.

Fig. 2 is a plan view showing the ends of the bag turning members in extended position illustrating a table on which the bags are deposited and the gripping mechanism which serves to strip the bags from the turning members.

Fig. 3 is a plan view of the central portion of the machine illustrating the table for supporting the bags to be turned, and also a portion of the bag turning mechanism and the means for actuating the same.

Fig. 4 is a view of the end of the machine looking from the right to the left, the supporting means for the cross head which actuates the bag turning members having been omitted and certain parts of the driving mechanism shown in section.

Fig. 5 is a vertical sectional view showing the gear and split nut which supports the standard for the bag receiving table, and

Fig 6 is a plan view of the same.

The bag turning machine illustrated herein has a frame which preferably comprises a cast iron base 1 adapted to be secured to the floor, said base having upwardly extending bosses 2, 3, 4, in which are seated posts 5, 6, 7 which may be made of commercial piping of a desired size screwed into said bosses.

The posts 5, 6 and 7 support at their upper ends a horizontal plate 8 having downwardly extending bosses provided with sockets to receive the upper ends of said posts.

The plate 8 is provided with upwardly extending marginal flanges 9, 10 which serve as guides for the bases of journal boxes 11 and 12 which are adjustably mounted upon the plate 8 and adapted to be moved toward and from each other by means of a rod 13 having screws 14, 15 of opposite pitch engaging respectively the journal boxes 11 and 12. A suitable crank 16 may be provided for rotating the rod 13.

The journal boxes 11 and 12 are provided with sleeves 17 and 18 preferably extending in parallelism and providing bearings for the bag turning members 19 and 20 which are in the form of tubes or rods having their bag engaging ends 21, 22 bent out of alinement with the axis of said rods. The ends 21, 22 are adapted when the rods are in normal retracted position to converge so that when the bag turning members are moved forwardly said ends will enter the mouth of the bag more readily.

The bag turning members 19 and 20 are reciprocated by means of a cross head slidably mounted upon a pair of parallel rods 24, 25 said guide rods being supported at their forward ends by a bracket 26 secured to the plate 8 and at their outer ends by a suitable bracket 27 carried by the posts 28.

The cross head also comprises a rod 29 extending transversely through the slidably mounted members 23, and provided with brackets 30, 31 engaging the end portions of said bag turning members 19, 20.

The cross head may be reciprocated in any suitable manner. A convenient means which is illustrated herein comprises a lever 32 which is mounted upon a pivot 33 carried by bosses extending upwardly from a stand 34 secured to the floor. The upper end of the lever 32 has a slot 35 which engages the rod 29 of the cross head between the sliding members 23 of the cross head, the lever 32 being oscillated by a pitman 36 pivotally connected at one end at approximately its middle and at the other end to a disk or fly wheel 37 within the periphery of the latter. The fly wheel 37 is carried at the end of a shaft 38 which is journaled in suitable bearings 39, 40 secured to the posts 6 and 7 respectively.

The shaft 38 may be driven in any suitable manner but preferably is provided with a gear 41 which meshes with a pinion 42 mounted upon a shaft 43 which is actuated through a suitable pulley 44 having a conical clutch face 45 adapted to be engaged by a cone 46 secured upon the shaft 43. Suitable means for causing engagement and disengagement of the cone clutch form a part of my invention and will be more fully described hereinafter. It will be obvious that the rotation of the shaft 38 and of the disk 37 will cause an oscillation of the lever 32 which in turn will reciprocate the cross head 23 to advance and retract the bag turning members.

Any suitable means may be provided for rotating the bag turning members either continuously or intermittently in the same direction but preferably in opposite directions to effect the purpose heretofore stated of causing the ends of the bag turning members to converge during their entrance into the mouth of the bag and to diverge during the advancing, turning movement.

A preferred means which is illustrated herein comprises a pair of racks and gears adapted respectively to oscillate the bag turning members in opposite directions, said racks being actuated from a cam upon the main shaft of the machine. The bag turning members 19 and 20 are provided respectively with gears 47, 48 having feather and slot connection to said rods to permit the rods to slide axially through the gears. The gear 47 engages an idle gear 49 which in turn meshes with a rack 50 slidably mounted in a guideway 51 carried by the plate 8. The rack 50 is secured at its end to a cross head 52 to which a rack 53 extending in the opposite direction from the rack 50 is also secured. The rack 53 is mounted in a suitable guideway 54 carried by the plate 8 and meshes with a gear 48. The reciprocation

therefore, of the cross head 52 will cause the gears 47, 48 to rotate in opposite directions thereby transmitting to the bag turning members 19, 20 a rotative movement which will cause the bent ends to converge and to separate as above described.

Any suitable means may be provided for reciprocating the cross head 52. A convenient means which is illustrated herein comprises a link 55 which connects the cross head 52 to the upper end of a lever 56 which is pivotally mounted upon a bracket 57 carried by the post 6. The lower end of the lever 56 is provided with a stud carrying an anti-friction roll 58 which engages the groove 59 of a cam 60 which is secured to the main shaft 38. The cam groove 59 desirably is so formed as to actuate the lever 56 after the ends of the bag turning members have advanced sufficiently to enter the bag and the lever 56 is so proportioned as to move the racks 50 and 53, just enough to cause a rotation of the gears 47 and 48 one hundred eighty degrees so that the bent ends 21, 22 of the bag turning members 19 and 20 will be rotated from the converging position in which they enter, to the diverging position illustrated in Fig. 2, shortly after they have entered the mouth of the bag and will remain in such position until the bag turning members have advanced to their limit and the bottom corners of the bags turned.

The cam 60 preferably is also constructed to cause the withdrawal of the bag turning members in their diverging positions until the ends 21, 22 approach the mouth of the bag whereupon the actuating means is operated to rotate said bag turning members to initial position.

In the preferred embodiment of the invention disclosed herein the reciprocation of the bag turning members and their rotation above described is accomplished through a single rotation of the main shaft 38 and means are provided for starting of the said mechanism and stopping the same upon each rotation of the shaft, said means being under the control of the operator.

In the preferred means illustrated herein the pulley 44, which is driven by a suitable belt from any power transmitting mechanism, is slidably mounted on the shaft 43 and is moved longitudinally thereof by a bracket $60^{\times}$ engaging a groove 61 in the hub of said pulley. The bracket $60^{\times}$ is rigidly secured upon a shaft 62 which is slidably mounted in bearings 63 secured respectively to the posts 5, 6, and 7.

A brake comprising a plunger 64 slidably journaled in bearings 65 and forced forward by a spring $65^{\times}$ is pivotally mounted upon the shaft 62 between suitable collars and is adapted to engage the rear face of the cone when the pulley 44 is removed from engagement with the cone. A suitable lug upon the frame sustains the braking means in position to engage the rear face of the cone while its pivotal connection upon the shaft 62 permits the brake to be removed from operative position when it is desired to run the machine continuously.

The outer end of the rod 62 is pivotally connected to the lever 66 which is fulcrumed upon a stud 67 on a bracket 68 projecting laterally from the bearing for the main shaft 43, the opposite end of said lever being provided with a roller 69 adapted to be engaged by a cam 70 secured to the end of the main shaft 38. The cam 70 is so positioned as to actuate the lever 66 to withdraw the pulley 44 from engagement with the cone 46 when the bag turning members have been retracted to initial position.

In order to provide for the easy starting of the machine by the operator, means are provided for releasing a resilient mechanism which will automatically cause the engagement between the cone and the pulley aforesaid.

This is accomplished by a helical spring 71 surrounding the shaft 62 and bearing at one end against the bracket 63 and which forms one of the journals for the shaft 62. The opposite end of said spring engages a collar 72 fixedly secured upon the shaft 62, the spring 71 being normally under compression and tending to force the pulley 44 into engagement with the cone 45.

When the shaft 62 is actuated by the cam 70 to remove the pulley 44 from engagement with the cone 45 against the compression of the spring 71 the parts are locked in said disengaged position by means of a toggle comprising links 73, 74 the link 73 being pivotally connected to a boss 75 upon the bracket 63 and the link 74 to a boss 76 upon a collar 77 which is fixedly secured to the shaft 62. The toggle links are so proportioned that when the shaft 62 is actuated to cause disengagement between the cone and pulley the links 73 and 74 will be brought into substantially axial alinement thereby positively preventing reëngagement of the cone and the pulley.

Any suitable means may be provided for actuating the toggle links 73, 74. As illustrated herein a hanger 78 is secured to the pivot which connects the links 73 and 74 and is provided with a downwardly extending rod 79 having at its end a weight 80 which always tends to draw the toggle members 73, 74 into locking position. In order to break the toggle lock for the purpose of starting the machine the rod 79 is provided with an adjustment stop 81 which may be in the form of nuts screwed upon a screw threaded portion of said rod. These nuts are adapted to be engaged by the preferably bifurcated end of the arm 82 of the bell crank lever which is fulcrumed upon a

bracket 83 carried by the post 5. The other arm 84 of said bell crank lever is provided with a cylindrical extension which is pivotally connected to an operating lever 85 which may conveniently be fulcrumed upon an extension 86 of the bracket 83.

The operating lever 85 desirably is provided with a wooden extension 87 adapted to be engaged by the leg of the operator. The arm 82 of the bell crank lever which is operable to engage the nut 81 to raise the rod 79 and break the toggle is normally held down and out of engagement with the nut by a helical spring 88 which is connected at its upper end to said arm and at its lower end anchored to the base 1.

In the operation of the machine the operator first positions a bag in front of the ends of the bag turning members, and reverses or folds over the edge of the open end thereof with his thumbs in such a manner as to thrust the reversed portion over the ends 21, 22 of the bag turning members. He then presses upon a lever 87 actuating the bell crank lever to cause the arm 82 thereof to engage the stop 81 on the rod 79 and by elevating the latter force the toggle links out of alinement, thereby breaking the toggle lock. Upon the breaking of this lock the spring 71 slides the shaft 62 longitudinally and forces the pulley 44 into engagement with the cone 46 thereby starting the machine and causing the reciprocation and rotation of the bag turning members in the manner aforesaid.

The advancing bag turning members first enter the reversed portion of the open end of the bag with their ends converging, then as they progress along the bag are rotated until the ends diverge. They are then held in this position until the limit of advancing movement is reached and the corners of the bag turned. The operator then releases his hold upon the mouth of the bag. When the bag has thus been fully turned it is in position to be stripped from the bag turning members. Preferably means are provided for gripping the bottom of the bag when the same has been fully turned and for holding it until the bag turning members have been withdrawn therefrom.

Another feature of my invention comprises an improved gripping mechanism for this purpose. As illustrated herein the gripping mechanism is carried by a post 90 which may be in the form of a pipe secured in a screw threaded socket extending upwardly from a stand 91 adapted to be secured to the floor. The upper end of said post is provided with a bracket 92 having an arm 93 extending diagonally downwardly to provide a journal for a pivoted bag penetrating instrumentality.

The bag penetrating instrumentality which is illustrated herein comprises a pair of rods 94 having downwardly turned sharp pointed ends 95 adapted to be thrust into the bag. The rods 94 are adjustably secured by brackets 96 to a rod 97 which is rotatably mounted in the depending bracket arm 93.

The bag penetrating instrumentality is actuated through a central arm 98 which is secured to the rod 97 and is oscillated by a vertical link 99 through mechanism which will hereinafter be described. An arm having a sector-like member $99^{\times}$ is rigidly secured to the rod 97 and is provided at its arcuate end with notches 100 which are adapted to be engaged by a spring pressed bolt 101 slidably mounted in a stand 102 carried by the bracket 92. In order to insure proper grouping of the bag and to support the lower side of the bottom of the bag while it is being withdrawn from the bag turning members I have provided a pivotally mounted means adapted to coöperate with and preferably operable by the bag penetrating instrumentalities. This means comprises a pair of arms 103 preferably having diverging end portions 104 adapted to engage the under surface of the bottom of the bag, said arms being connected by brackets 105 to a rod 106 which is rotatably mounted in journals in arms 107, 108 of a bracket connected to the post 90. Any desirable means may be provided for causing proper cooperation of the bag supporting members 103 and the bag penetrating instrumentalities 94. A convenient means which is illustrated herein comprises a link 109 depending from the arm 98 which actuates the bag penetrating instrumentalities, the lower end of said link engaging a slot or way 110 in a downwardly inclined member 111 which is rigidly secured to the rod 106.

It will be obvious that the reciprocation of the rod 99 oscillates the arm 98 and thereby moves the bag penetrating instrumentality about its pivotal support. At the same time the depending link 109 actuates the bag engaging member 103 in the opposite direction so that these members grip the bag as by the closing up of a pair of jaws and release the bag by a reverse movement. Inasmuch as it is necessary to actuate the bag gripping means when the bag has been fully turned and to release the bag gripping means when the bag turning members are withdrawn from the mouth of the bag it is desirable that the gripping mechanism shall be actuated by the same means as that which operates the bag turning members. This is accomplished in the present invention by connecting the rod 99 to the arm 112 of the bell crank lever which is pivoted upon a bracket 113 at the lower portion of the post 90. The other arm 114 of said bell crank lever is connected to a bar 115 which is supported upon suitable rollers 116 disposed

at desirable distances along the floor or upon the frame. The bar 115 is provided at its opposite end with slots 117, 118 in which the studs or shafts of rollers 119, 120 are adjustably mounted, said rollers being positioned to engage opposite sides of the lever 32 which actuates the bag turning mechanism. By reason of this construction the lever 32 engages respectively the rollers 119 and 120 near the ends of its oscillating movement and only actuates the gripping mechanism when such engagement takes place.

By providing means for adjusting the position of these rollers the bag gripping mechanism may be operated at any desired time in the reciprocation of the bag turning members to release the bag just as the turning members are being withdraw from its mouth.

It may be stated that the engagement of the spring actuated pin 101 with the notches 100 on the sector 99× serves to lock the bag gripping device either in gripping position or in expanded position as the same may be actuated by contact of the lever 32 with the roller 119 or the roller 120.

Another feature of the invention relates to means for supporting the bags about to be turned and for receiving the bags after they are turned. The preferred mechanism for supporting the bags which are to be turned comprises a table 121 having a central standard 122 in the form of a piston, the head 123 of which fits a cylinder 124 supported by and preferably extending through the floor by which the machine is supported. Means are provided for supplying the cylinder 124 with fluid under pressure, preferably air under pressure and for controlling the same.

As illustrated herein air under pressure is supplied through the main pipe 125 leading from a suitable compressor through a three-way cock 126 to a pipe 127 which leads to the lower portion of the cylinder. A lever 128 may be provided for regulating the amount of fluid under pressure delivered to the cylinder and consequently thereby regulating the height of the table which supports the bags about to be turned. In operating the machine it is desirable that the table shall always support the uppermost bag at substantially the same height with the mouth extending away from the operator so that the operator can raise the mouth of the bag and with his thumbs reverse the end portion of it and slip the reversed portion over the ends of the bag turning members without making any unnecessary exertion. To this end means are provided for actuating the three-way cock which controls the supply of fluid under pressure to the cylinder 124 which will be actuated by the engagement of the uppermost bag. A preferred means comprises an arm 129 which may be provided with antifriction rollers 130 adapted to engage the uppermost bag. The arm 129 desirably is offset as illustrated in Fig. 4 and pivoted at its opposite end to a suitable stud 131 carried by the plate 8.

Intermediate of its ends the arm 129 is secured by a pivot 132 to a link 133 which is connected at its upper end to the lever 128.

It will be obvious that the mechanism may be so constructed that when the table 121 descends the weight of the arm 129 will actuate the lever 128 to turn on a supply of fluid under pressure. This supply of fluid will then actuate the piston 123 to raise the table 121 and as the table is raised the uppermost bag will carry upwardly with it the arm 129 which will first shut off the supply of compressed air when the table reaches the predetermined height. Further pressure upon the table will cause the actuation of the valve to release the compressed air through the usual vent in such valve so that the lever can descend to the neutral position. By this means the table will be at all times so supported that the uppermost bag is in exactly the same position within the reach of the operator.

A further feature of the invention consists in providing a means for receiving the turned bag which will be caused to descend as successive bags are deposited upon it so that the turned bags may be properly piled one upon another. In my prior patent means are disclosed for accomplishing this purpose which consist of a table supported by a fluid under pressure, the table being adapted to be reversed end for end as successive bags are deposited. The descent of the table is controlled by a valve in the pipe which conveys the fluid under pressure to the cylinder which supports the table.

In the use of that device it was contemplated to supply the actuating fluid under pressure at such a pressure that the additional weight placed upon the table as successive bags were piled thereupon would serve to depress the table so as to maintain the uppermost bag at substantially the same level.

In the present device the bag receiving means is provided with mechanism operable to lower the table gradually during the operation of the machine and independent means are provided for restoring the table to its initial position.

As shown herein the bag receiving table 134 is supported by a central standard 135 which is provided with the peculiar form of screw threads illustrated in Fig. 5 in which the wall 136 of each screw thread is beveled downwardly and outwardly, and the under surface of the screw thread presents a flat shoulder. These screw threads are adapted to be engaged by complementary screw

threads formed upon sections of a split nut comprising a pair of complementary members 137—138 which are pivotally mounted upon studs 139, 140 upon the web of a worm gear 141. The sections 137, 138 of the split nut are normally pressed toward each other to cause engagement of their threads with the threads of the standard by a spring 142 which engages the outsides of the members 137, 138 and tends to force them together. The spring 142 desirably is clamped between an arcuate support 143 and inner face of the rim of the gear as illustrated in Fig. 6.

In order automatically to release the engagement between the split nut and the gear upon the standard 135 the supporting plate for the center of the table is provided with a downwardly extending boss 134ˣ having a beveled peripheral surface adapted to engage complementary beveled surfaces 137ˣ, 138ˣ on the sections of the split nut, so that when the table reaches its lowermost position it will automatically spread the sections of the split nut apart, thus releasing the same from engagement with the screw and arresting the table while permitting the gear 141 to continue to rotate.

It will be obvious that the gear 141 may be rotated so as to cause the table 134 to descend as successive bags are placed upon it. In order to raise the table to elevated or initial position I have provided a quickly actuated means operable by the fluid under pressure. As illustrated herein the lower end of the stem 135 is provided with a piston head 135ˣ fitting a cylinder 144 through which air under pressure is supplied by a pipe 145 connected by a three-way cock with the supply pipe 125. The three-way cock may be actuated by a lever 146 which preferably is retained in neutral position by a suitable spring. When the operator is about to start the machine he pulls the lever 146 so that fluid under pressure is introduced into the cylinder 144 and the table forced upwardly by the pressure therein to its highest position. The bag turning machine is then started and the gear 141 rotated to cause the gradual descent of the table.

The gear 141 preferably is a worm gear and is engaged by a worm 147 upon a shaft 148 mounted in suitable bearings 149, 149ˣ, 150, 151, the opposite end of said shaft being connected by a universal joint 152 to a short shaft 153 having a beveled gear 154 upon it which meshes with a gear 155 upon a countershaft 156 carried by brackets 157, 158 secured respectively to the posts 6 and 7. The shaft 156 desirably is driven from the gear 41 through a gear 159 meshing therewith. In order to provide an independent control for the table actuating mechanism the gear 159 desirably is loosely mounted upon the shaft 156 and is provided with a clutch face 160 which is engaged by a complementary face upon a clutch member 161 slidably secured upon the shaft 156. The clutch 161 may be actuated in any desirable manner, a convenient means which is illustrated herein comprises a lever 162 which is mounted at its lower end upon a pivot 163 carried by the base 1 of the main frame, said lever 162 being connected intermediate of its ends to a latch 164 having notches 165 adapted to lock the clutch either into or out of engagement with the gear 159 by engagement with a keeper 166.

In the operation of the machine a pile of bags are placed upon the table 121 and fluid under pressure is admitted to the cylinder 124 until the uppermost bag engages the arm 129 which controls the supply of fluid under pressure, thereupon the supply is automatically shut off and the uppermost bag retained at a predetermined elevation above the floor. The operator then grasps the bag and with his thumbs reverses a portion of the mouth thereof presenting the reversed portion to the bag turning members which at that time are withdrawn to their limit, the offset end portions being in a converging position so as to readily enter the bag presented to them, the bag being thus held by the operator until it is fully turned by the advancing bag turning members. The operator then presses with his knee upon the lever 87 rocking the same and actuating the arm 84 of the bell crank lever, causing the arm 82 thereof to raise the rod 79 and to break the toggle 73, 74. Thereupon the spring 71 slides the shaft 62 lengthwise (to the left) and forces the conical face 45 of the pulley 44 into engagement with the cone 46 of the shaft 43. Inasmuch as the pulley 44 is a driven pulley the rotation of the shaft 43 causes the gear 42 to drive the gear 41 upon the main shaft 38, thereby rotating the disk 37 and through the pitman 36 actuating the lever 32 which in turn reciprocates the cross head which is connected to the bag turning members.

The rotation of the main shaft 38 also causes the cam 60 to oscillate the lever 56 and thereby to reciprocate the racks 50 and 53, thus causing the rotation of the gears 47 and 48 respectively which are feathered upon the bag turning members and causing the bag turning members as they advance to turn so that their previously converging ends are brought to a diverging position before the bag is completely turned. This rotative movement of the bag turning members not only assists the operator in applying the bag to the bag turning members but also insures the proper stretching of the bag and the complete turning of the corners by the diverging ends of the bag turning members. While it is desirable that the end portions of the bag turning members shall be bent and positioned in the manner de-

scribed to enable the mouth of the bag to be easily slipped over them, it will be readily understood that if straight bag turning members are used, their rotative movement will facilitate their entry into the bag; also that the rotation of the bag turning members in opposite directions will tend to stretch the bag and thereby insure proper reversal of the seam and corner portions of the bag. When the bag has been completely turned, the operator releases his hold upon it and the bag is then stripped from the turning members in the following manner.

When the bag turning members have advanced to their limit and the bag has been fully turned the lever 32 engages the roller 119 upon the sliding bar 115 and actuates the bell crank 112, 114 thereby causing the link 99 to draw down upon the arm 98 of the bag penetrating instrumentality and to force the prongs 95 through the bottom portion of the bag. At the same time the link 109 actuates the bag supporting members 103 to grip the lower portion of the bag. Continued rotation of the main shaft 38 causes the withdrawal of the bag turning members from the bag and the restoration of the bag turning members to their original converging position.

During this retracting movement the lever 32 is oscillated (to the right Fig. 1) so that it comes in contact with the roller 120 on the bar 115 just as the ends of the bag turning member are about to be removed from the mouth of the bag. Further movement of the lever 32 in the same direction causes the retraction of the bag penetrating members 95 and supporting member 103 so that the bag is released substantially simultaneously at both ends and falls upon the table 134.

As the bags successively drop upon the table 134 the table is lowered by the rotation of the gear 141 through its split nut which engages the screw threads upon the standard 135.

When the bags have been turned and the bag turning members retracted to initial position the cam 70 upon the main shaft 38 engages the roller 69 upon the lever 66 and actuates said lever to move the shaft 62 endwise (to the right) thereby disengaging the pulley 44 from the cone 46 and applying the brake 64, thus instantly arresting the machine.

This operation occurs upon each full backward and forward reciprocation of the bag turning members unless the operator continues to press upon the operating lever 87, in which case the bag turning members continue to reciprocate.

If it is desired to retain the bag receiving table 134 at a predetermined height without lowering the same during the operation of the bag turning mechanism, the latch 164 may be raised to release the engagement of the inner notch with the keeper 166 then pushed endwise until the outer notch 165 engages the keeper, thus the clutch 161 will have been shifted and locked out of engagement with the clutch 160 of the gear 159, thereby preventing the rotation of the shaft 153, the worm 147 and the gear 141 so that the table will remain in the position in which it has been placed.

When it is desired to raise the table the operator pulls the lever 146 sufficiently to actuate the three-way valve to supply a fluid under pressure to the cylinder 144 beneath the piston 135×, thereby forcing the standard 135 upwardly through the split nut until the desired height is reached, whereupon the shutting of the three-way valve by reverse movement of the lever will stop the elevation of the table. The peculiar formation of the threads 136, which are of conical form, readily permits the upward movement of the standard of the table while positively preventing its downward movement.

In order to provide for turning bags of different lengths suitable collars 167, 168 (see Figs. 1 and 3) are secured to the bag turning members 19, 20 upon opposite sides of the brackets 30, 31 by set screws or other releasable means so that the bag turning members may be withdrawn or extended through said brackets 31 to any desired position. When the bag turning members are thus shortened for shorter bags the penetrating members 94 of the bag gripping mechanism are adjusted forward through their brackets 96 and the bag supporting members 103 are correspondingly adjusted forward to their brackets 105 so that the gripping means will properly engage the bottom portion of the bag as above described.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. In a bag turning machine comprising a plurality of bag turning members, means for reciprocating said members to cause them to enter and while advancing reverse a positioned bag and means for rotating said members during their advancing movement, whereby their introduction into the bag is facilitated and the proper turning of the bag insured.

2. In a bag turning machine comprising a plurality of bag turning members, means for reciprocating said members to cause them to enter and while advancing reverse a positioned bag and means for rotating said members oppositely in one direction during their advancing movement to facilitate their introduction into the bag and for rotating them in the reverse direction during their withdrawal from the bag.

3. In a bag turning machine comprising

a plurality of bag turning members, means for reciprocating said members to cause them to enter and while advancing reverse a positioned bag and means for rotating said members oppositely in one direction during their advancing movement to facilitate their introductions into the bag and for rotating them in the reverse direction during their withdrawal from the bag comprising gears slidably mounted upon said bag turning members and means for rotating said gears.

4. In a bag turning machine comprising a plurality of bag turning members, means for reciprocating said members to cause them to enter and while advancing reverse a positioned bag and means for rotating said members oppositely in one direction during their advancing movement to facilitate their introduction into the bag and for rotating them in the reverse direction during their withdrawal from the bag comprising gears slidably mounted upon said bag turning members, racks engaging said gears and means for reciprocating said racks.

5. In a bag turning machine comprising a plurality of bag turning members having their bag engaging ends bent away from axial alinement and converging toward each other when said members are in retracted position, means for reciprocating said members axially to enter and during their advancing movement reverse a positioned bag, and means for rotating said members during their advancing movement to cause their bag engaging ends to diverge, whereby the introduction of the bag turning members into the bag is facilitated and the turning of the corners of the bag insured.

6. In a bag turning machine comprising a plurality of bag turning members having their bag engaging ends bent away from axial alinement and converging toward each other when said members are in retracted position, means for reciprocating said members axially to enter and during their advancing movement reverse a positioned bag, and means for rotating said members during their advancing movement to cause their bag engaging ends to diverge, whereby the introduction of the bag turning members into the bag is facilitated and the turning of the corners of the bag insured, said means acting upon withdrawal to rotate said bag turning members in the reverse direction to release the turned bag.

7. In a bag turning machine comprising a plurality of bag turning members having their bag engaging ends bent away from axial alinement and converging toward each other when said members are in retracted position, means for reciprocating said members axially to enter and during their advancing movement reverse a positioned bag, and means for rotating said members during their advancing movement to cause their bag engaging ends to diverge, whereby the introduction of the bag turning members into the bag is facilitated and the turning of the corners of the bag insured, said means acting upon withdrawal to rotate said bag turning members in the reverse direction to release the turned bag, gripping means and means for actuating the same to hold the turned bag during the withdrawal of the bag turning members and to release said bag upon the removal of the bag turning members.

8. In a bag turning machine comprising a plurality of bag turning members, means for reciprocating said members to cause their bag engaging ends to enter and turn a positioned bag, means for rotating said members during their reciprocating movement and means for adjusting said bag turning members toward and from each other.

9. In a bag turning machine, a frame, a pair of gears journaled in bearings slidably mounted on said frame, bag turning members slidably keyed to said gears, means for reciprocating said bag turning members axially to cause them to enter and turn a positioned bag, means for rotating said gears alternately in opposite directions during their advancing and retracting movements respectively and means for adjusting said bearings toward and from each other whereby bags of different widths may be turned.

10. In a bag turning machine, a frame, a pair of gears journaled in bearings slidably mounted on said frame, bag turning members slidably keyed to said gears, means for reciprocating said bag turning members axially to cause them to enter and turn a positioned bag, means for rotating said gears alternately in opposite directions during their advancing and retracting movements respectively and means for adjusting said bearings toward and from each other whereby bags of different widths may be turned including a screw having threads of opposite pitch engaging the respective slidable bearings.

11. In a bag turning machine comprising a plurality of bag turning members, means including a cross head for reciprocating the same to cause them to enter and turn a positioned bag, means for adjusting said members in said cross head, and means for rotating said bag turning members during their reciprocating movement.

12. In a bag turning machine comprising a plurality of bag turning members, actuating means for advancing and retracting said members to cause them to engage and turn a positioned bag and withdraw from the same, including a clutch, means constantly acting to force the members of said clutch into engagement, automatically operating means for withdrawing said clutch mem-

bers from engagement with each other when the bag turning members reach retracted position and manually controlled means for causing reëngagement of said clutch members.

13. In a bag turning machine comprising a plurality of bag turning members, actuating means for advancing and retracting said members to cause them to engage and turn a positioned bag and withdraw from the same, including a clutch, means constantly acting to force the members of said clutch into engagement, automatically operating means for withdrawing said clutch members from engagement with each other when the bag turning members reach retracted position, means for locking said clutch members out of engagement including a toggle and manually operable means for breaking the toggle.

14. In a bag turning machine comprising a plurality of bag turning members, actuating means for advancing and retracting said members to cause them to engage and turn a positioned bag and withdraw from the same, including a clutch, means constantly acting to force the members of said clutch into engagement, automatically operating means for withdrawing said clutch members from engagement with each other when the bag turning members reach retracted position, means for locking said clutch members out of engagement including a toggle, a weight suspended from the pivotal connection of the knee of said toggle and manually operable means for raising the weight and breaking said toggle.

15. In a bag turning machine comprising a plurality of bag turning members, actuating means for advancing and retracting said members to cause them to engage and turn a positioned bag and withdraw from the same, including a clutch, means constantly acting to force the members of said clutch into engagement, automatically operating means for withdrawing said clutch members from engagement with each other when the bag turning members reach retracted position, means for locking said clutch members out of engagement including a toggle, a weight suspended from the pivotal connection of the knee of said toggle and manually operable means including a bell crank lever adapted to be engaged by the leg of the operator and operable to raise the weight and break said toggle.

16. In a bag turning machine comprising a plurality of bag turning members, actuating means for advancing and retracting said members to cause them to engage and turn a positioned bag to withdraw from the same, including a clutch, means constantly acting to force the members of said clutch into engagement, automatically operating means for withdrawing said clutch members from engagement with each other when the bag turning members reach retracted position, means for locking said clutch members out of engagement including a toggle, a rod connected to the knee of said toggle having an adjustable stop thereon, a lever engaging said stop and means operable by the leg of the operator to actuate said lever to break the toggle.

In testimony whereof, I have signed my name to this specification.

PETER J. GAGNON, Jr.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."