Nov. 5, 1946. B. A. HANNEWALD ET AL 2,410,731

BAG TURNER

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FIG. 2.

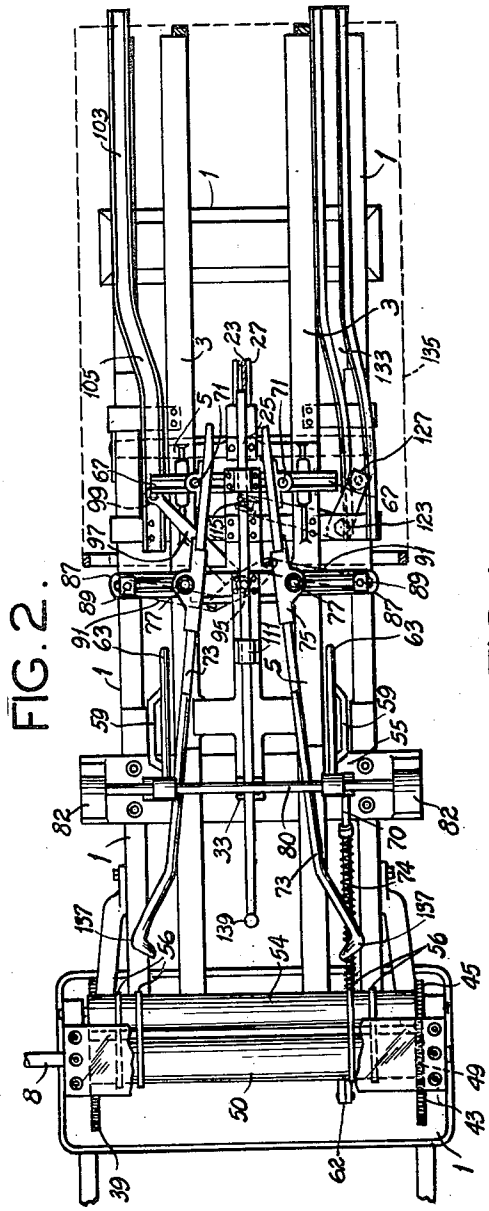
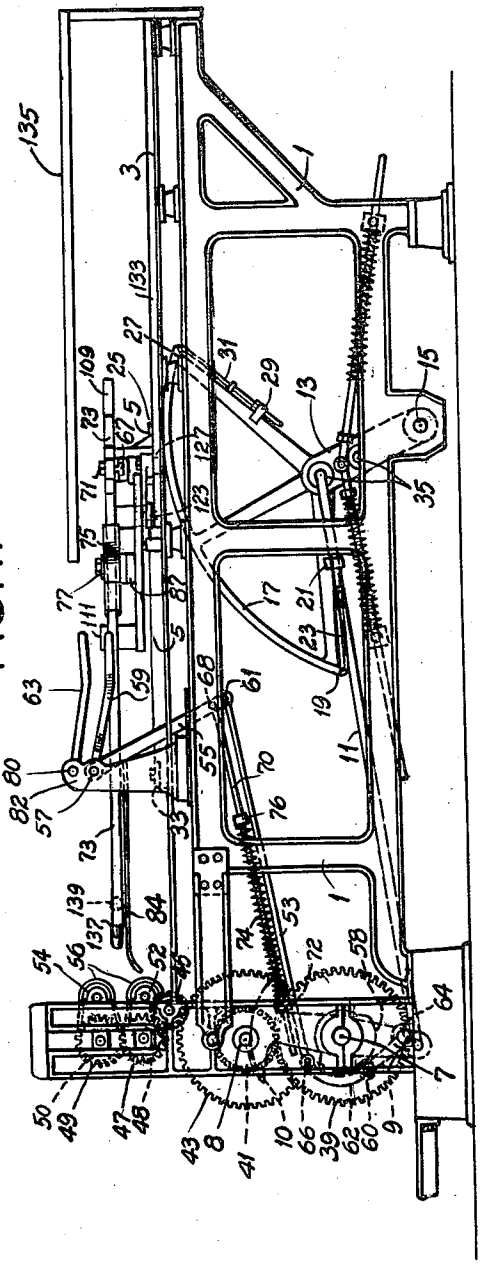


FIG. 1.



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FIG. 3.

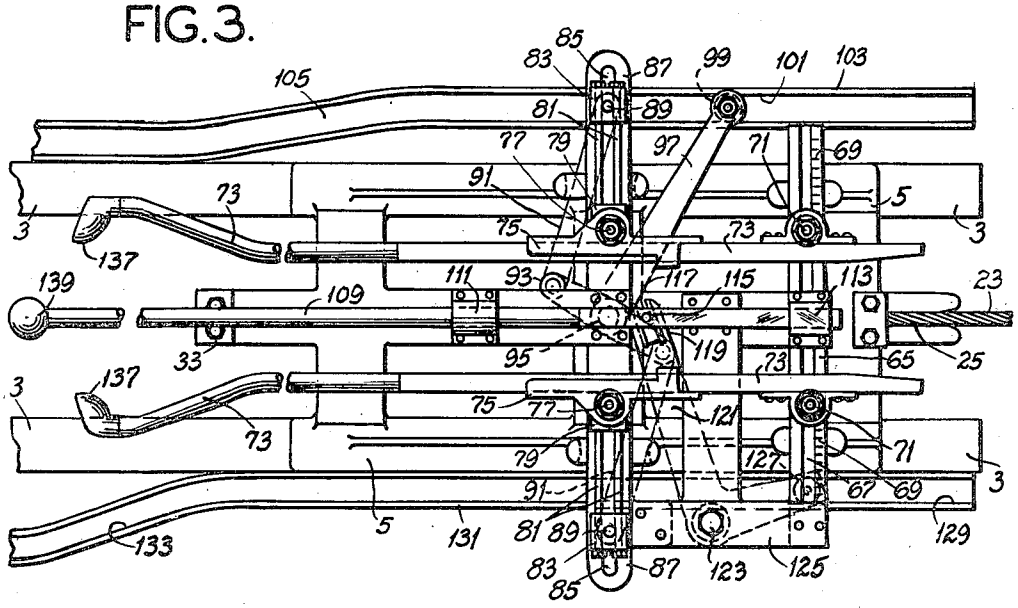


FIG. 4.

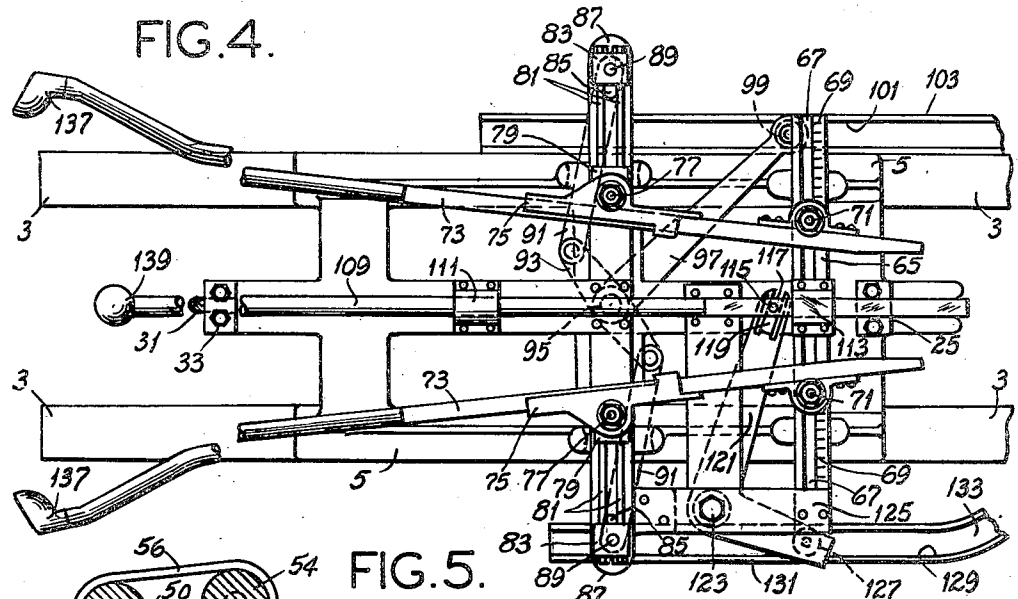
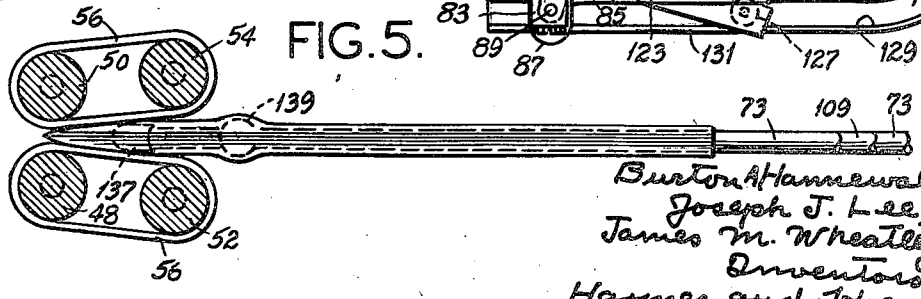


FIG. 5.



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BAG TURNER

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FIG. 6.

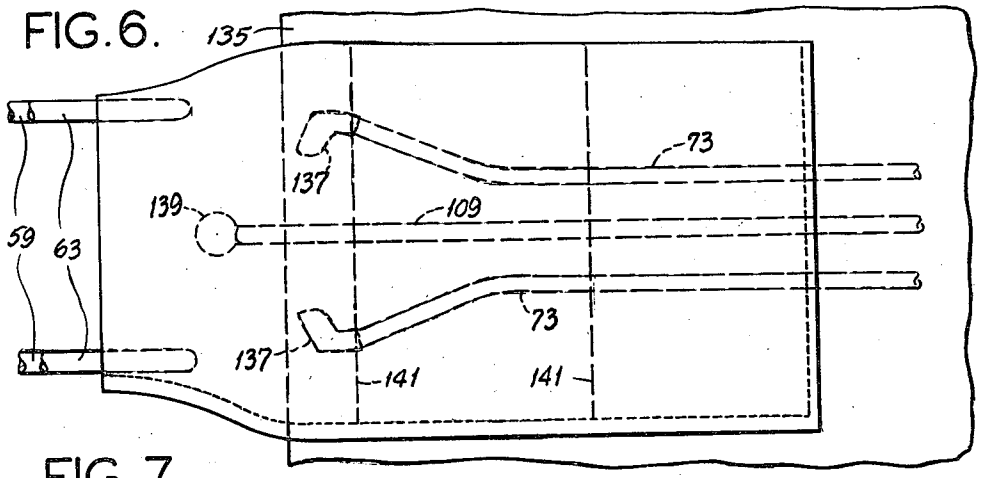


FIG. 7.

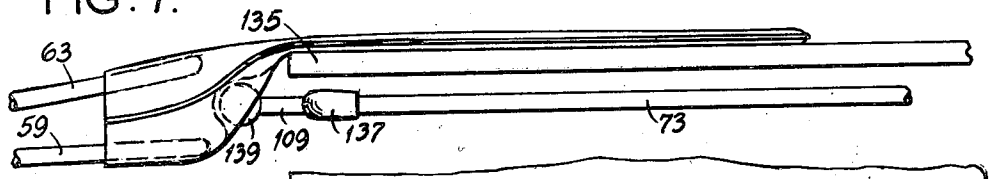


FIG. 8.

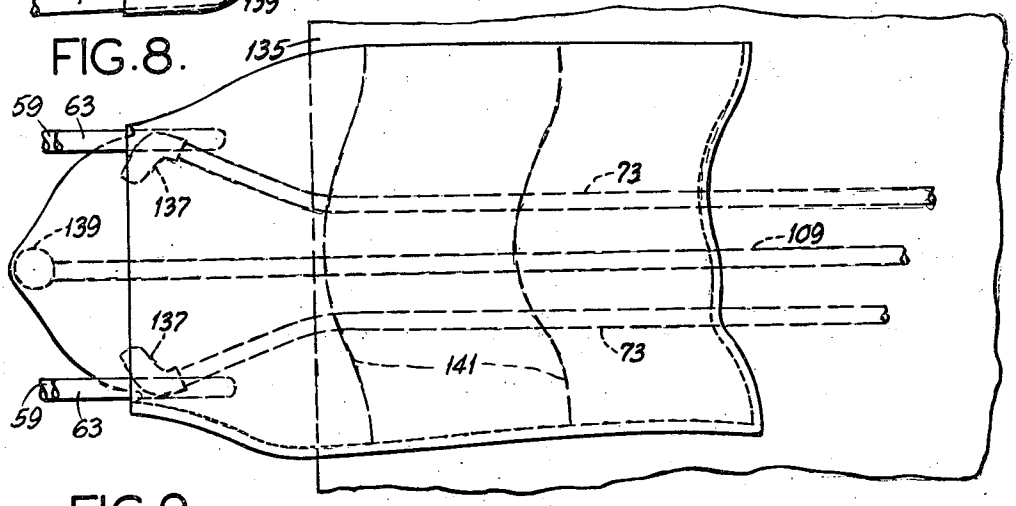
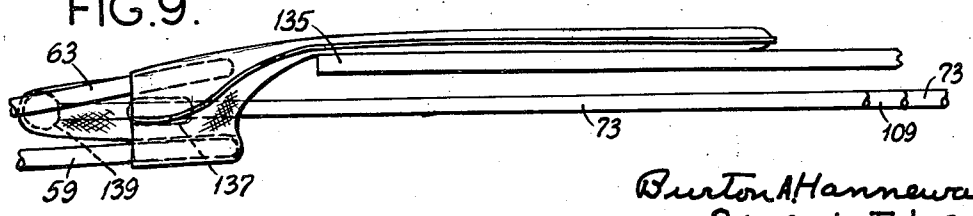


FIG. 9.



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BAG TURNER

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FIG. 10.

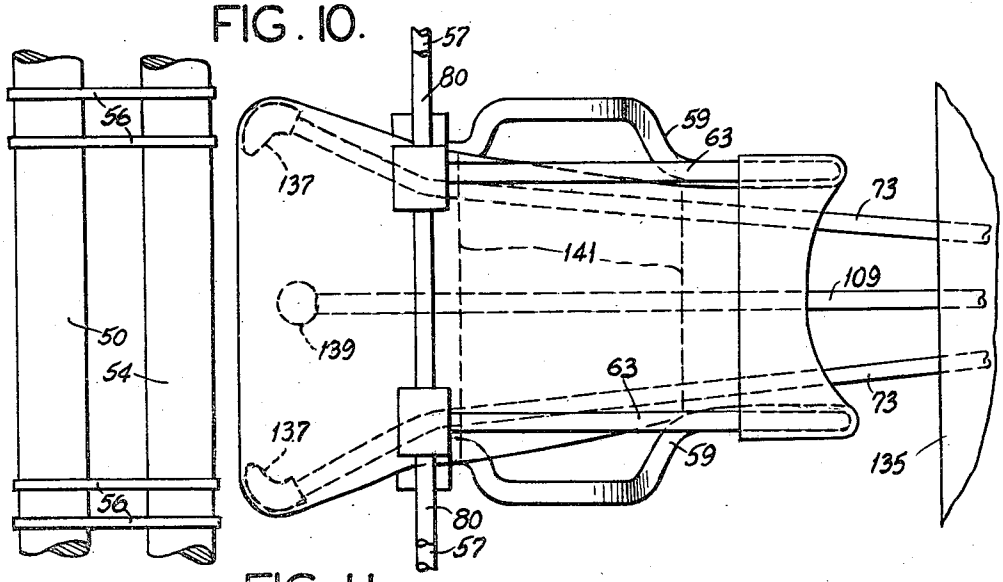
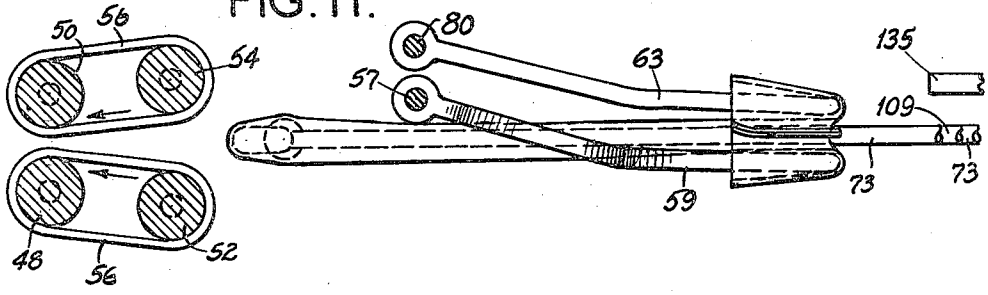


FIG. 11.



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Patented Nov. 5, 1946 2,410,731

UNITED STATES PATENT OFFICE

2,410,731

BAG TURNER

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Application November 8, 1945, Serial No. 627,402

10 Claims. (Cl. 223—39)

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This invention relates to bag turners, and with regard to certain more specific features, to so-called stick turners, particularly for turning banded-label bags such as shown in the United States patent applications of Charles V. Brady and August F. Ottinger, Serial Nos. 535,004, 578,976 and 646,577, filed May 10, 1944, February 21, 1945 and February 9, 1946, respectively.

Among the several objects of the invention may be noted the provision of a stick type of bag turner which will turn banded-label bags without tearing the labels; the provision of a turner of the class described which may be operated at the same speed as former turners operating on non-labeled bags; and the provision of apparatus of the class described which may readily be adapted to bag turning apparatus now in use. Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly comprises the elements and combinations of elements, features of construction, and arrangements of parts which will be exemplified in the structures hereinafter described, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, in which one of various possible embodiments of the invention is illustrated,

Fig. 1 is a side elevation showing substantially an entire bag turning apparatus to which the invention is applied;

Fig. 2 is a plan view of Fig. 1;

Fig. 3 is an enlarged detail plan view of significant portions of Fig. 2 shown in a retracted position;

Fig. 4 is a view similar to Fig. 3 showing the parts in an advanced position;

Fig. 5 is a fragmentary detail showing certain turning sticks feeding a bag into take-off means;

Fig. 6 is a diagrammatic view of parts set according to Fig. 3 but illustrating preliminary operations on a bag;

Fig. 7 is a front elevation of Fig. 6;

Fig. 8 is a view similar to Fig. 6 but showing an advanced position of parts;

Fig. 9 is a front elevation of Fig. 8;

Fig. 10 is a view similar to Fig. 8 but showing a still further advanced position of parts; and,

Fig. 11 is a front elevation of Fig. 10.

Similar reference characters indicate corresponding parts throughout the several views of the drawings.

So-called stick types of turning machines have been used for bag turning. In these a bag mouth is applied over several sticks, usually four. These

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sticks are then spread apart by pairs and additional reciprocating sticks are then driven against the bottoms of the bags to push these through the mouths so as to turn the bags inside out. By inside out is meant that bags which are manufactured with their rough seams outside are turned so as to place these rough seams inside. In general, two reciprocating turning sticks are used located quite close to the bag edges. These drive the bag bottoms through their mouths. The purpose of this is to produce a flat turned bag. This former scheme is satisfactory for bags which bear no inside labels or the like prior to turning. Such bags in general have the labels applied after turning.

According to said two applications above mentioned by number, and as further indicated herein, some bags are now made with a girthwise labeling band or the like applied to the fabric before the bag is formed. When the bag is sewn this band or label is on the inside. When such bags are applied to the old turners, the turning sticks operating quite close to the bag edges tend to buckle the bag fabric at these points, and consequently also the labels. The buckling is quite sharp, particularly at the bag edges. Since the stated labels have portions at the bag edges, they also are turned quite sharply and there is some tendency to tear, crack or break these so that they become disfigured in their final outside positions. The present invention overcomes this difficulty in respect to this class of labeled bags.

Referring now more particularly to Fig. 1, there is shown at numeral 1 a frame on which are guide rails 3 for a reciprocating carriage 5. In the frame 1 is a rotary crankshaft 7 carrying a crank 9 (counterweighted at 10) which through a connecting rod 11 oscillates a lever 13 pivoted at 15 in the frame 1. Shaft 7 is driven from a power shaft 8 through a gear train 41, 39. The lever 13 carries a grooved sector 17, the outer circular face of which is centered at 15. Looped over a forward edge 19 of the sector 17 and fastened at 21 is a cable 23 which passes tangentially off to the rear from the sector and is attached at 25 to the rear end of the carriage 5. Likewise, there is looped over a rear portion 27 of the sector 17 and fastened at 29 a cable 31 which passes tangentially from the sector forwardly to a fastening 33 at the front end of the carriage 5. Thus upon rotation of the crank 9 and oscillation of the lever 13, along with the oscillation of the sector 17, the carriage 5 may be reciprocated on the guide rails 3. The stroke may be adjusted by adjusting the position of the

pin joint between the connecting rod 11 and the lever 13 in one of several holes such as shown at 35, thus accommodating the stroke to various lengths of bags.

On the said shaft 8 is also a gear 43 which drives a pinion 45. The latter drives gears 47 and 49 for driving a set of draw rolls 48 and 50 receiving between them turned bags.

In front of the rolls 48 and 50 are mounted rolls 52 and 54, respectively. Belts 56 over the respective pairs of rolls 50, 54 and 48, 52 move in the direction shown in Fig. 11 to receive turned bags and eject them from the machine. A suitable belt shifter mechanism may be used for the belts 56 to adjust them laterally on the rolls to accommodate them to various bag widths, but since this shifter forms no part of the present invention, it is not shown nor further described.

On the shaft 7 is a cam 58 which bears against a follower roll 60, the latter being carried upon a lever 62 pivoted at 64. Pinned at 66 at the end of the lever 62 is a connecting rod 53. At the other end the rod 53 is pivoted at 61 to rocking lever 55. Pivoted at 68 on the lever 55 is a rod 70 which at its outer end slides through an eye 72 on the frame 1. A spring 74 reacting from the frame and against a collar 76 carried on the rod 70 serves to bias the driving linkage for the lever 55 so that the follower 60 is held against the cam 58.

Lever 55 is carried on a rock shaft 57 on which also are held two lower spreaders 59. On fixed shaft 80, above the spreaders 59 are two upper, non-rocking spreaders 63. By a known suitable means, not shown, the members of the respective pairs of spreaders 59 and 63 may be adjusted to various lateral distances for accommodation to various bag widths. The shafts 57 and 80 are carried upon a support 82. A platen 84 extends from this support toward the rolls 52 and 54. A table 135 is positioned above the frame 1 behind the support 82.

The parts above described are old and further description will be unnecessary. The improvements herein described have to do particularly with attachments on the carriage 5. Referring now more particularly to Figs. 3–11, the carriage 5 has rigidly mounted on it a crossbar 65 in which is a T-slot 67. Along it are index marks 69. In the slot 67 are adjustable T-headed studs 71 which may be loosened and tightened at any desired position along the slot 67. These bolts 71 form pivots for lateral, swinging turning sticks 73. These sticks swing in a horizontal plane. Each stick 73 has attached to it a block 75 which has a pivoted connection 77 with a head 79. Each head 79 is carried on the ends of a pair of rigid bars 81, extending from a slide 83. Each slide has a suitable extension in a guide slot 85 at the respective end of a second cross guide 87 of the carriage 5. Pivoted connections 89 serve to connect the slides 83 with oppositely angled and directed connecting links 91. These links 91 are inwardly pivoted to a rocker 93. The rocker is pivoted at 95 to the carriage 5. An extension arm 97 from the rocker 93 provides means for oscillating the rocker. This extension arm 97 at its outer end carries a roll follower 99 which slides in a groove 101 in a track 103 affixed to the frame 1. The groove 101, as indicated in Fig. 3 has an offset 105 which, when the carriage 5 is reciprocated serves to rotate the arm 97 relatively to the carriage 5. Thus when the carriage 5 traverses the frame 1, the rocker 93 will be oscillated and cause opposite reciprocating motions of the slides 83 in the guide slots 85. The heads 79 being rigidly connected with the slides 83 will cause properly timed rocking actions of the turning sticks 73 in the horizontal plane about the pivots 71.

At numeral 109 is shown a central turning stick which is slidable longitudinally in bearings 111 and 113. The front portion of the stick is round in bearing 111 and square in bearing 113, thus preventing it from turning indiscriminately on its axis. Pivoted at 115 on the stick 109 is an oscillating block 117 which fits in the forked end 119 of a bell crank 121. This bell crank is pivoted at 123 to an extension part 125 of the carriage 5. One leg of the bell crank carries a roll follower 127 which operates in a groove 129 of a second track 131, also attached to the frame 1. This track 131 has an offset 133 (Figs. 3 and 4) which upon reciprocation of the carriage 5 provides swinging movement of the bell crank 121 with respect to the carriage. This movement is of an oscillating character and at a predetermined point in the travel of the carriage 5 causes relative axial advance or retraction of the stick 109 with respect to the carriage.

Operation is as follows:

Rotation of the shaft 7 turns the crank 9 which through connecting rod 11 oscillates the rocker 15 and the sector 17. Thus the carriage 5 is reciprocated by the flexible connections 23 and 31. The cam 58 drives the follower 60 which, through the lever 62 and rod 53, oscillates the lever 55. This oscillates the lower set of spreaders 59. The upper spreaders 63 remain fixed.

Also, through the gear train 43, 47 and 49 is effected turning of the rolls 50, 48 and movement of the belts 56. Adjacent belt reaches move from the apron 84 toward the outlet of the machine.

Assuming that the carriage 5 is retracted to the right as far as possible (see Fig. 3), the lower spreaders 59 become raised so that they are close to the spreaders 63. The operator slides the open mouth of a bag over the spreaders 63 and 59, the body portion of the bag resting on table 135. This is done at the time that the carriage 5 is about to advance to the left.

As the carriage 5 begins to move forward, the spreaders 59 are caused to be withdrawn from the spreaders 63 so as to hold the mouth of the bag open and taut, providing an opening through which the body of the bag may be pushed to turn it inside out.

As the carriage advances the turning sticks 73 are together as shown in Fig. 3 with the end 139 of stick 109 in advanced position of ends 137 on the sticks 73. A substantial lead of stick 109 relative to sticks 73 is maintained during the early part of the travel.

The conditions are diagrammed in Figs. 6 to 11. As the carriage 5 advances the ball end 139 of the central turning stick 109 enters the center of one side of the bag and starts turning the bag inside out from its center (Figs. 6 and 7). As turning proceeds (Figs. 8 and 9) the sticks 73 follow in, at first without spreading. The lead of stick 109 is maintained. As the action continues the bag turns inside out at the center so that most of the inside label band 141 has been turned by a pull on the fabric from the center, as caused by the central stick 109. By first pushing the bag through its mouth by a central push as described, the label band 141 is bent with the least buckling. It should be noted that this band is generally made of paper attached by means of paste to the inside of the bag, which is made

of fabric. Therefore this gentle initial central turning action is doubly important.

After most or all of the label has been turned by the central stick 109, the follower 99 reaches the offset 105 in groove 101. This causes a clockwise rotation of the rocker 93 with a spreading of the slides 83 in the guides 85. This causes spreading of the pivots 77 and angling out of the lateral turning sticks 73. Thus these sticks take over the turning action after the danger to the label strip has passed. Turning is then completed by the sticks 73 (see Figs. 5, 10 and 11), which in spreading also flatten out the bag being turned. At the time that the turning action is taken over by the sticks 73, the follower 127 reaches the offset 133 in groove 129, which causes the bell crank 121 to rotate clockwise relative to the carriage 5. This causes retraction of the central stick 109 with respect to the carriage. Thus the central stick 109 loses ground with respect to forward movement of the sticks 73 and the turning is completed by the spread sticks 73. The ends 137 of these sticks feed the bottom end of the bag between the belts 56, which frictionally grasp the bag and feed it out of the machine from the platen 84. It will be noted that reciprocation of the turning sticks 73 and 109 is just above said platen 84.

It may be noted that the timing is such that as the bag reaches the end of the turning operation with its turned bottom near the belts 56, the lower spreaders 59 begin to rise so as to loosen the grip of all of the spreaders 59 and 63 on the bag mouth. Hence continued forward motion of the sticks 73 serves to strip the turned mouth of the bag from the ends of the spreaders 59 and 63. The ends of these spreaders are rounded so that this stripping action occurs without damage to the bag. The stripping action continues as the turned bottoms of the bags are fed in between the belts 56. Thus the bags are flattened throughout their lengths.

It will be understood that it is not desirable to continue the turning operation at the center by means of the ball 139 in advance of the ends 137 after the label has been satisfactorily either partially or completely turned. This is because the ball 139 might tend to punch a hole in the bottom of the bag if the timing of the action of spreaders 59 were not perfect. Therefore it is desirable during the final part of the turning operation as described to have the ball head 139 fall back relatively to the ends 137 until the ball is at least not substantially in advance of said ends 137. In other words, the ball 139 in the final stages of turning may be about between the ends 137 or behind them.

After the carriage 5 has reached the left-hand end of its trovel, the sector 17 oscillates back and retracts it. This causes a reverse order of the events above described and the withdrawal of the sticks into position under the table 15. At the time that the carriage 5 has retracted to the right its maximum distance, the operator applies another bag to the spreaders 59 and 63, which at this time have gone back to their non-spreading positions close to one another.

Advantages of the invention include the broad one stated, which is a starting of the turning action of the bag by means of a centrally applied turning stick which causes the easiest possible bending action on the materials of the inside paper or like attached label. Then as the functions of this central stick have been accomplished, the advancing, separating sticks 73 take over and

complete the turning in such a way as to present the turned bags flatwise into the belts 56 for delivery from the machine in desirable flat turned condition.

Another advantage of the invention is that it is easily applicable to present-day horizontal-table turners such as outlined, since all that is required is the addition of the track 131 and the following equipment on the cariage 5, such as the bell crank 121 and the central sliding turning stick 109.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As many changes could be made in the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

We claim:

1. An improvement in a bag turner having a reciprocating carriage which reciprocates a pair of oppositely located turning sticks; comprising a third turning stick loacted between said pair of sticks, bearing means on the carriage for supporting the third stick movably with respect to the carriage and parallel to its line of reciprocation, and means for moving said third stick relative to the carriage first so that its end is in advance of the ends of said pair of sticks and thereafter retracting with respect to the ends of said pair of sticks.

2. An improvement in a bag turner having a longitudinally reciprocating carriage which moves a pair of oppositely located turning sticks, the latter operating edgewise on bags; comprising a third turning stick located centrally with respect to said pair of sticks, bearing means on the carriage for supporting the third stick movably with respect to the carriage and parallel to its line of reciprocation, and means for moving said third stick longitudinally relative to the carriage first so that its end is in advance of the ends of said pair of sticks as the carriage starts a forward movement, and as the carriage nears the end of its forward movement retracting said third stick with respect to the ends of said pair of sticks until the end of the third stick is near or behind a line joining the ends of said pair of sticks.

3. An improvement in a bag turner having a reciprocating carriage which moves a pair of oppositely located turning sticks, the latter entering bags and spreading to operate edgewise on bags; comprising a third turning stick located in a plane substantially central with respect to the plane of spreading of said pair of sticks, bearing means on the carriage for supporting the third stick movably with respect to the carriage and parallel to its line of reciprocation, and means for moving said third stick longitudinally relative to the carriage so that its end is in advance of the ends of said pair of sticks as the carriage starts a forward movement, and as the carriage nears the ends of its forward movement and said pair of sticks spread retracting said third stick with respect to the spread ends of said pair of sticks until the end of the third stick is near or behind a line joining the ends of said pair of spread sticks.

4. In a bag turner having a reciprocating carriage adapted to advance and retract and having a pair of lateral and longitudinal turning sticks on the carriage; comprising a central longitudinal turning stick movable longitudinally with the car-

riage and relatively thereto, means responsive to the movement of the carriage for first maintaining the end of the central stick in advance of the ends of the lateral sticks during an initial part of the carriage advance, said means being adapted relatively to retract the end of said central stick with respect to the lateral sticks during further advance movement of the carriage.

5. In a bag turner having a reciprocating carriage adapted to advance and retract and having a pair of lateral and longitudinal turning sticks on the carriage, said sticks spreading upon advance of the carriage; comprising a central longitudinal turning stock movable longitudinally with the carriage and relatively thereto, means responsive to the movement of the carriage for first maintaining the end of the central stick in advance of the ends of the lateral sticks during an initial part of the carriage advance and before said sticks spread, said means being adapted relatively to retract the end of said central stick with respect to the lateral sticks during further advance movement of the carriage and as said pair of sticks spread.

6. In bag turning apparatus having a reciprocating carriage adapted to be advanced and retracted, and said carriage having longitudinal and laterally located turning sticks, the ends of which are adapted to be spread during the final period of the carriage advance; comprising a central longitudinal turning stick longitudinally movable on the carriage, means responsive to movement of the carriage for maintaining the end of said central stick ahead of the ends of said lateral sticks during initial advance movement of the carriage, said means during said spreading movement of the ends of the lateral sticks causing said end of the central stick to be retracted at least to a point approximately between the ends of said lateral sticks.

7. An attachment for bag turning apparatus having a reciprocating carriage adapted to advance and retract, said carriage having lateral turning sticks advancing and retracting therewith; comprising a central longitudinal stick longitudinally movable on and with respect to the carriage, a rocking means pivoted to the carriage and cooperating with said central stick to move it in respect to the carriage, a follower carried by said rocker, and a cam track stationary with respect to the carriage and engaged by said follower, said track being shaped to cause movement of the rocker in response to carriage movement, said track being shaped so that upon initial advance of the carriage the end of the central turning stick is located ahead of the ends of the lateral turning sticks and during final carriage advance said central turning stick is retracted to a position not substantially in advance of the said ends of the lateral sticks.

8. An attachment for bag turning apparatus having a reciprocating carriage adapted to advance and retract, said carriage having a pair of lateral turning sticks advancing and retracting therewith and having ends which spread as the advance progresses; comprising a central longitudinal stick longitudinally movable on and with respect to the carriage, a rocking means

pivoted to the carriage and cooperating with said central stick to move it in respect to the carriage, a follower carried by said rocker, and a cam track stationary with respect to the carriage and engaged by said follower, said track being shaped to move the rocker in response to carriage movement to move the rocker with respect to the carriage, said track being shaped so that upon initial advance of the carriage and before spreading of said pair of sticks the end of the central turning stick is located ahead of the ends of said pair of turning sticks and during further carriage advance said central turning stick is retracted to a position not substantially in advance of the then spread ends of said pair of sticks.

9. An attachment for a bag turner having a reciprocating carriage adapted to advance and retract, said carriage having pivoted thereon lateral turning sticks mounted to move with the carriage and to angle their ends away from one another during carriage advance; comprising a central longitudinal turning stick mounted on the carriage to move therewith and relatively thereto, a rocker pivoted to the carriage and cooperating with the central turning stick to move the same relatively to the carriage, a follower carried by the rocker, a stationary cam track fixed with respect to the carriage and cooperating with said follower, said cam track being shaped so that upon initial advance of the carriage the end of the central turning stick moves with the carriage in advance of the ends of said lateral turning sticks before said last-named ends separate, said cam track during the final advance movement of the carriage when the ends of the lateral sticks separate causing the advance end of said central turning stick to be retracted to a position substantially between said lateral turning sticks in their advance in the separated conditions of their ends.

10. An attachment for a two-stick bag turner having a reciprocating carriage upon which said sticks are mounted for advance and retraction of the ends of the sticks; comprising a central stick mounted on the carriage for movement therewith and longitudinally relatively thereto, a bell crank pivoted to the carriage, one arm of the bell crank having a forked connection with said central stick for moving the stick longitudinally with respect to the carriage, said bell crank having a second arm, a follower on said second arm, a stationary cam track adjacent to the path of motion of the carriage and cooperating with said follower, said cam track having a straight portion therein arranged to control said follower to hold the bell crank in a position wherein during initial advance movement of the carriage the end of said central turning stick protrudes beyond the ends of said lateral sticks, said track having an offset located so that at a predetermined time in the advance movement of the carriage said end of the central stick is retracted to a position more nearly adjacent to the ends of said lateral sticks as the carriage finishes its advance.

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