

April 17, 1934.

Y. A. AHNGER

1,955,401

BAG TURNING AND LINING MACHINE

Filed April 29, 1930

6 Sheets-Sheet 1

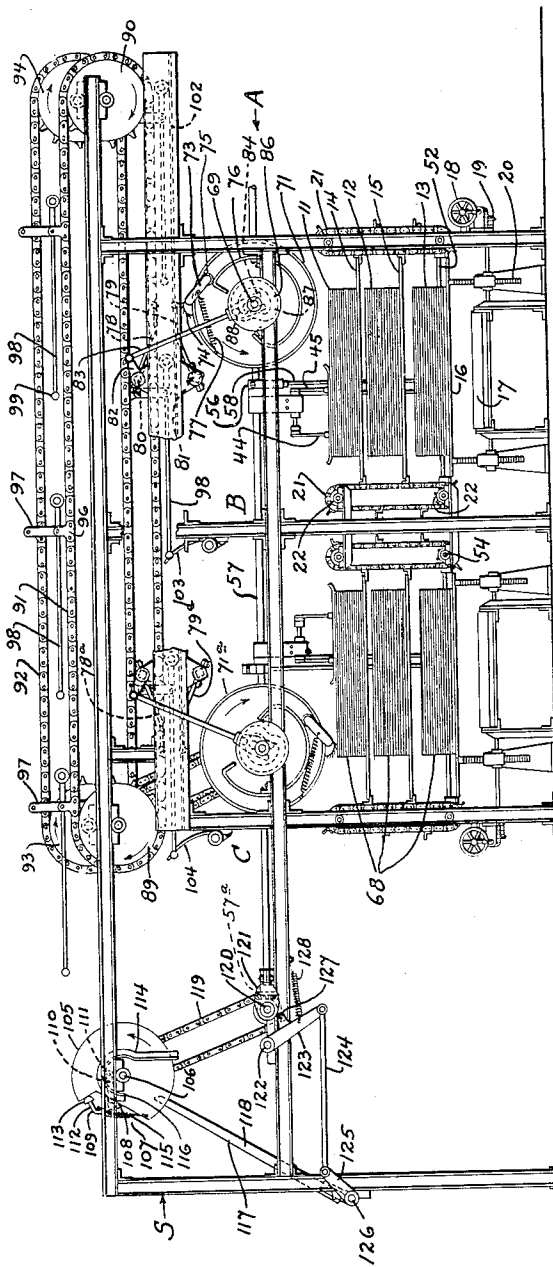


Fig. 1.

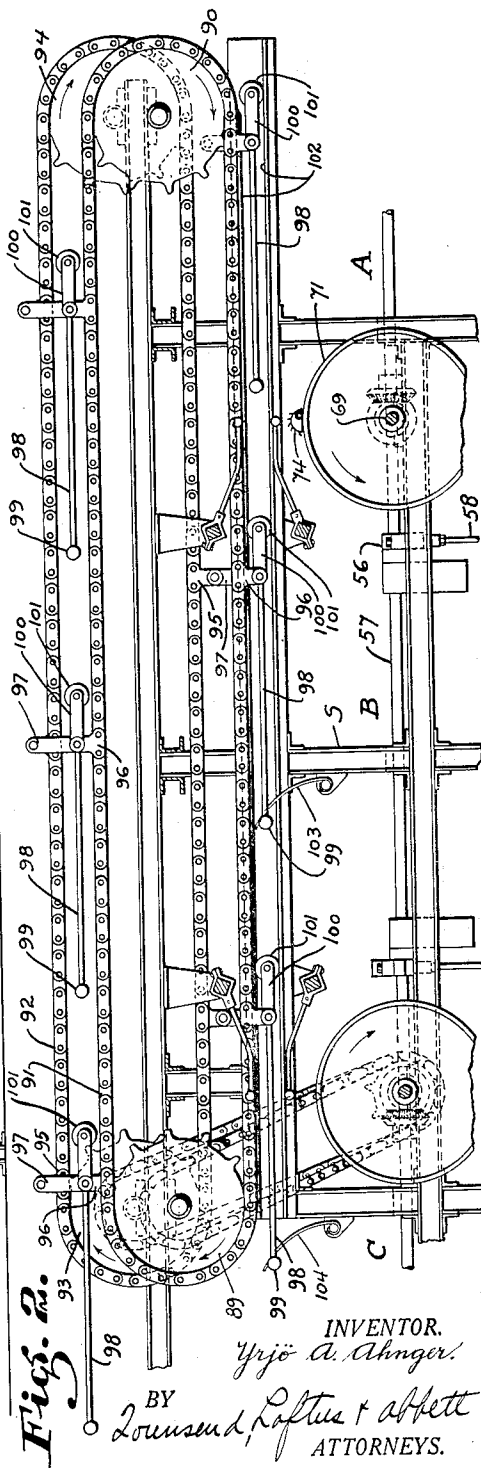


Fig. 2.

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6 Sheets-Sheet 2

Fig. 4.

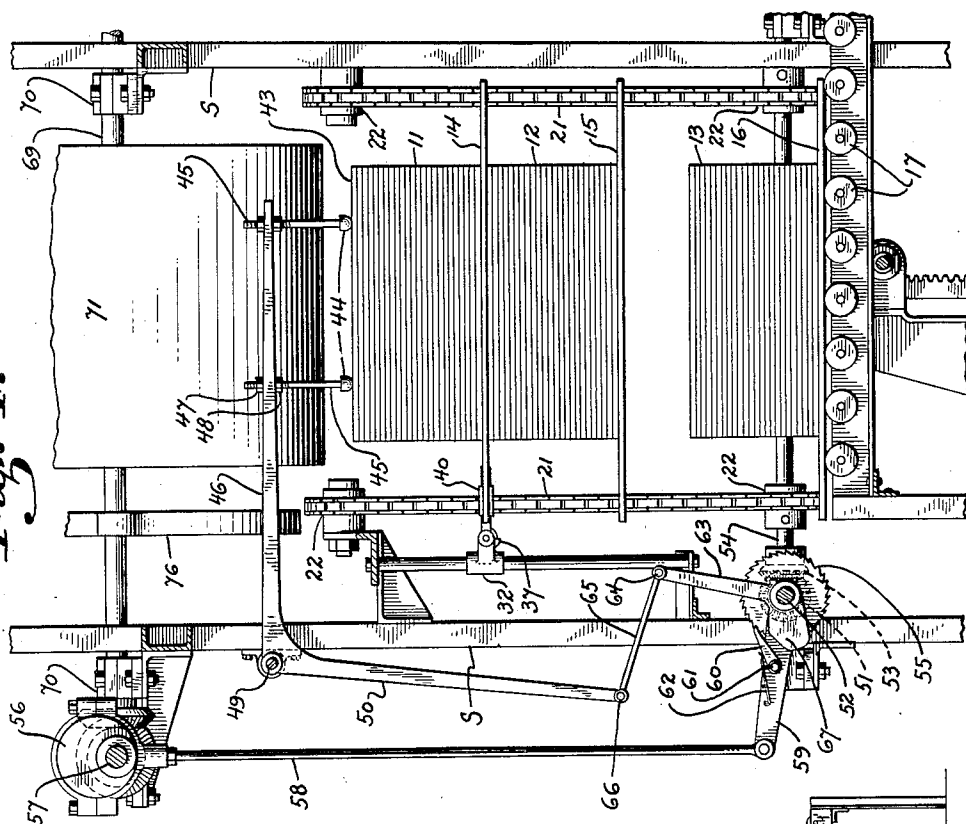
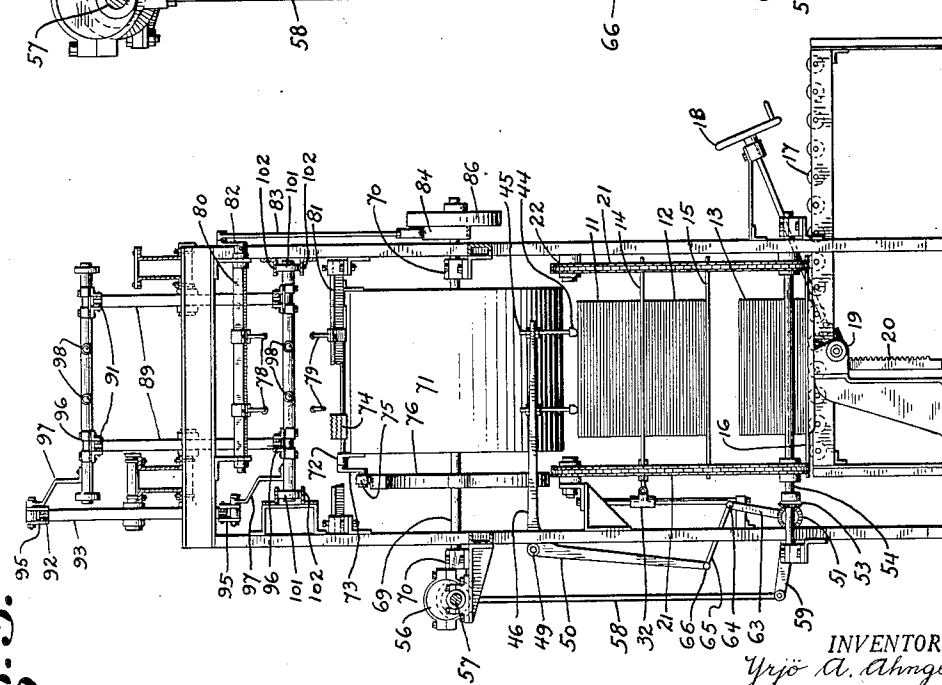


Fig. 3.



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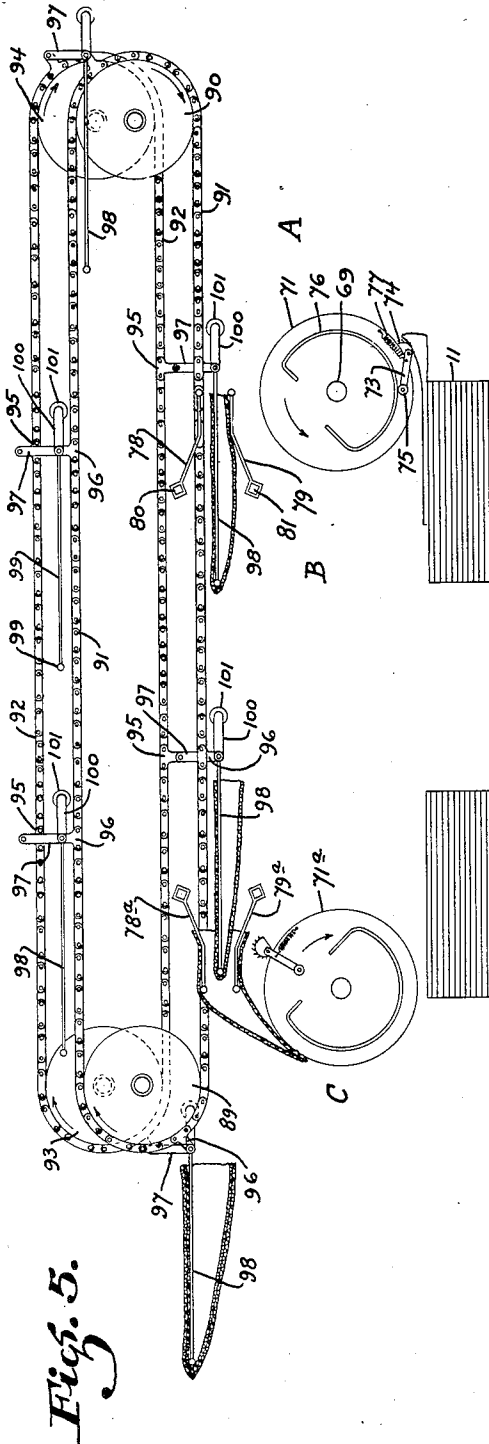
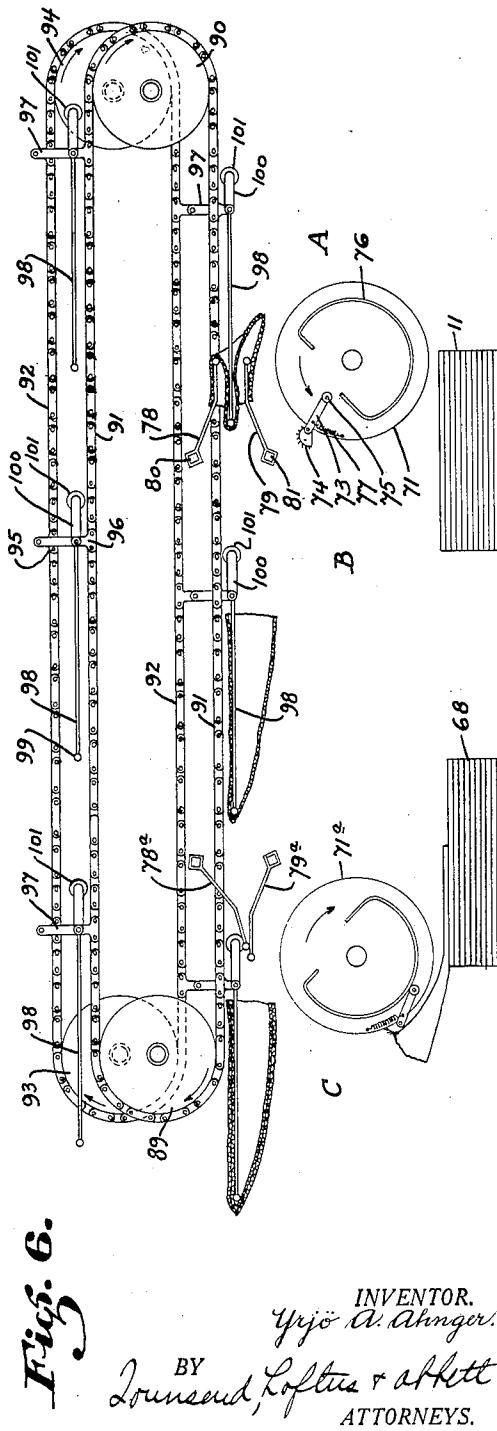
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BAG TURNING AND LINING MACHINE

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6 Sheets-Sheet 3



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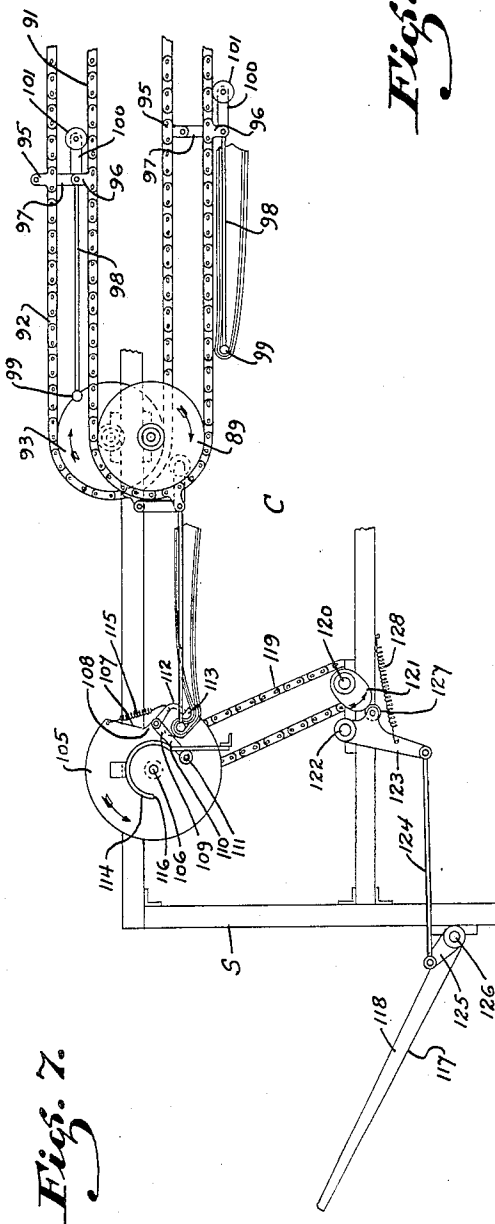
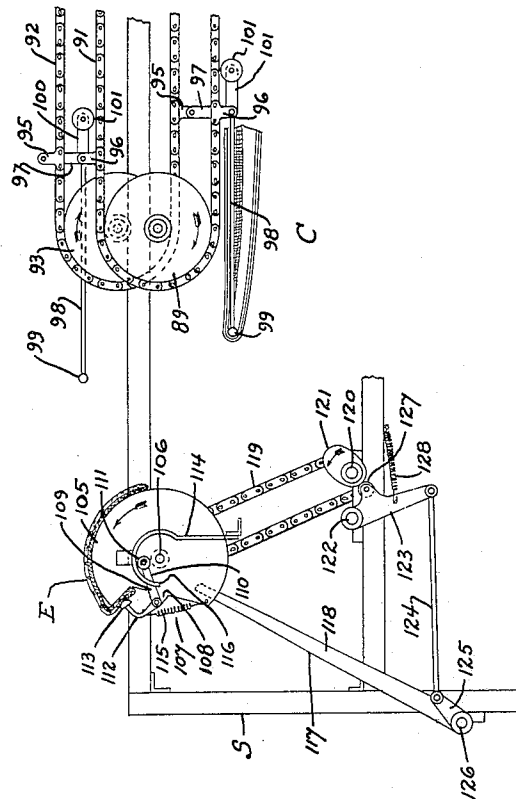
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BAG TURNING AND LINING MACHINE

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6 Sheets-Sheet 4



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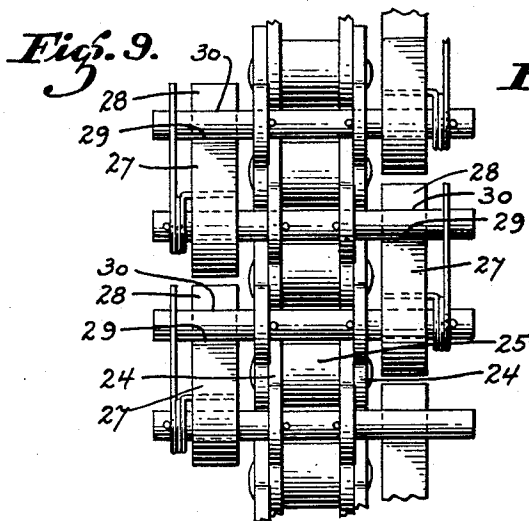
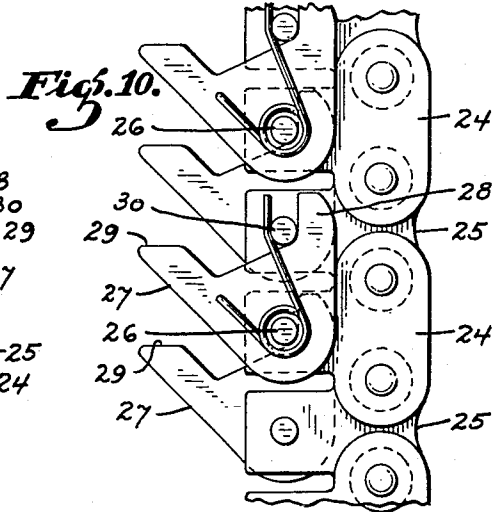
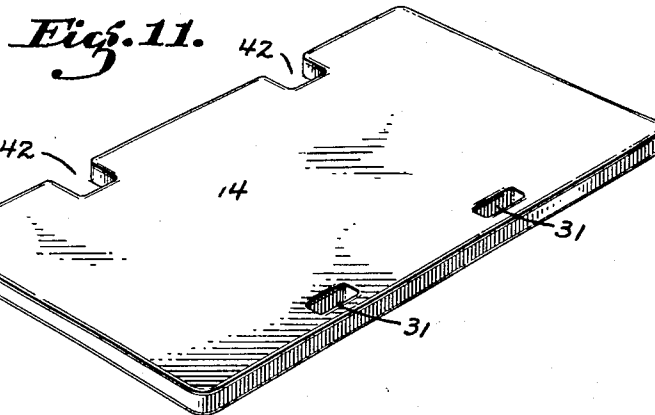
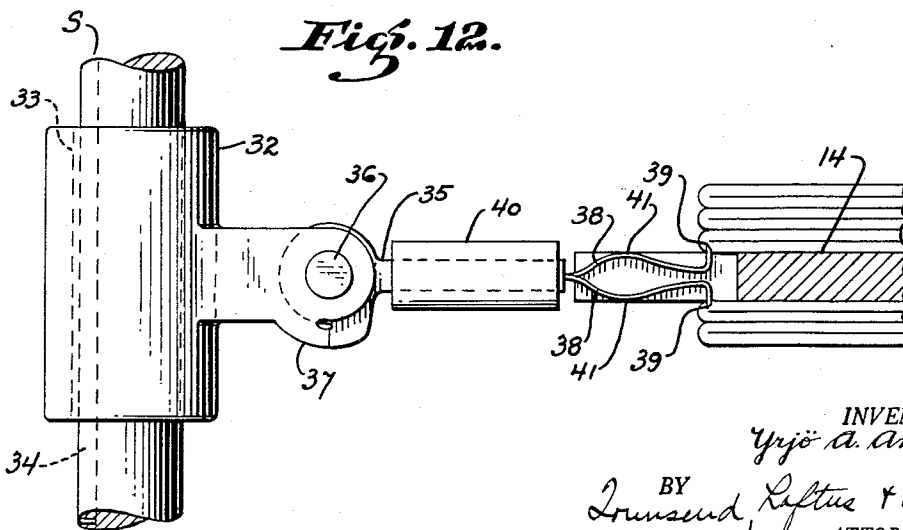
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BAG TURNING AND LINING MACHINE

Filed April 29, 1930

6 Sheets-Sheet 5



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BAG TURNING AND LINING MACHINE

Filed April 29, 1930

6 Sheets-Sheet 6

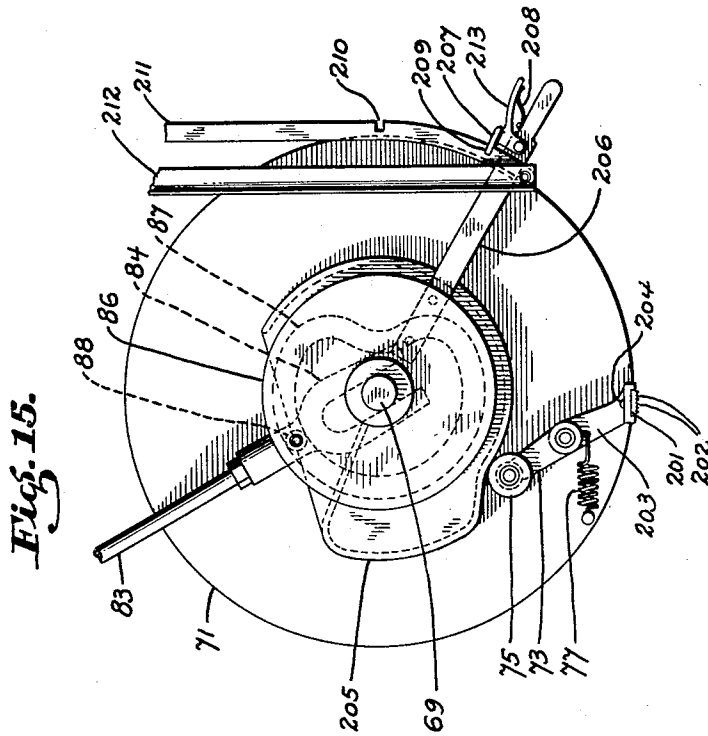


Fig. 15.

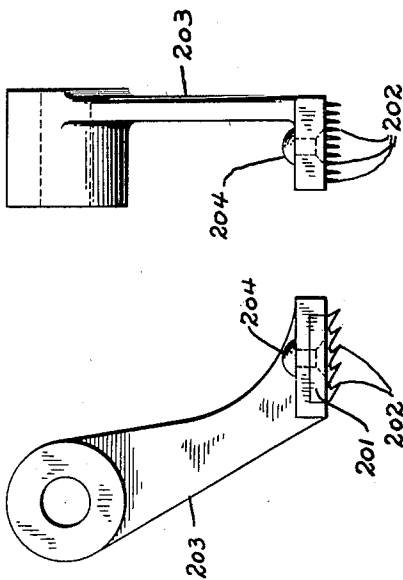


Fig. 14.

Fig. 13.

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UNITED STATES PATENT OFFICE

1,955,401

BAG TURNING AND LINING MACHINE

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Application April 29, 1930, Serial No. 448,265

36 Claims. (Cl. 223-20)

This invention relates to machines used in the manufacture of bags, and specifically to machines for turning and lining bags.

An object of the invention is to provide a machine which will automatically pick a bag off of a pile of bags and turn it inside out.

Another object of the invention is to provide a machine which will not only pick a bag or a bag liner off of a pile and turn it inside out, but will also automatically insert such turned liner into a bag, thus making a complete bag ready for use for containing sugar or other commodity.

Another object of the invention is to provide means to feed bags and bag liners to be turned and inserted, whereby they are presented to the machine in piles in such a manner that the top of the pile remains at a constant level.

Another object of the invention is to provide means to remove the completed bags and to suitably dispose of them as they emerge completed from the machine.

Other objects will appear from the appended description taken in connection with the appended drawings, in which I have illustrated an exemplification of my invention.

Referring to these drawings—

Fig. 1 is a front elevational view illustrating my invention,

Fig. 2 is a similar view of a portion thereof on an enlarged scale,

Fig. 3 is a view from the left end of Fig. 1, with parts removed,

Fig. 4 is a view similar to Fig. 3 of a portion of the device on an enlarged scale,

Figs. 5, 6, 7, and 8 are more or less diagrammatic views illustrating the operation of the machine,

Fig. 9 is a front elevation on an enlarged scale of the chains and supporting lugs,

Fig. 10 is a side elevation thereof,

Fig. 11 is a perspective view of a supporting plate,

Fig. 12 is an enlarged vertical sectional view with the chain removed illustrating the means for holding the bags while a plate is being removed,

Fig. 13 is a side elevation of a different form of the members for picking up the bags,

Fig. 14 is a front elevation thereof, and

Fig. 15 is an elevation of a means for making inoperative the members which pick up the bags.

I provide a suitable supporting member designated generally by S, this supporting member having various uprights and cross members not specifically hereinafter referred to, since the ne-

cessity thereof and location thereof will be obvious from the appended description.

I provide a series of piles of bag linings 11, 12, 13 to be operated upon by a machine constructed according to my invention, and these are stacked on trays 14, 15, 16, respectively, which are preferably of aluminum. These trays are shoved one at a time along and over the rollers 17 so that they will be moved to the left as shown in Fig. 3, to a position where they may be lifted by a rack and pinion elevator which comprises an operating hand wheel 18 actuating a pinion 19, which in turn actuates a rack 20 to raise it and thereby to raise the aluminum plate and the stack of bag linings thereon to a suitable height where it is to be taken up and raised further by a chain elevator. This chain elevator comprises two chains 21 passing over suitably located sprockets 22, as illustrated more in detail in Figs. 9 and 10. The chains are made up of outer links 24 and connecting links 25 suitably connected together by pins 26. On the pins 26 are suitably journaled, for partial rotation thereon, lugs 27 so arranged as to permit the trays to be raised past them but preventing motion of the trays in a downward direction therepast. Thus, as the lugs on the inner bight of these elevator chains move upwardly with the chains, they will carry the trays with them, but they will permit the trays to be raised by the rack and pinion elevator (or manually) to such a position that the top liner or bag lining of the stack on a tray may be raised to contact with the aluminum plate of the next adjacent stack thereabove. These lugs comprise a forked member having arms 28 and 29 and they are pivoted on the pins 26 at the fork. Lugs 30 are provided as extensions of the pins to function as stops to prevent the arms 28 from swinging to the left as shown on Fig. 10, and they thereby prevent the arms 29 which support the aluminum trays from moving downwardly to a position wherein they will no longer support such trays. It will now be apparent that as the tray is shoved upwardly past the lug 27, the arms 29 will be shoved inwardly thereby and the tray may accordingly pass such lugs and be moved higher up on the chain.

Thus as the different stacks of bag linings are moved inwardly along the rollers 17 onto the rack and pinion elevator, such rack and pinion elevator is actuated to move this stack into direct contact with the stack next above it.

A means is provided whereby the aluminum trays may be removed as they reach a position near the top of the composite stack. These trays

are preferably rectangular in cross section, as illustrated on Fig. 11, and they are each provided with hand holes 31 to permit the operator to insert his hands therethrough to get a good grip thereon. The trays are to be removed manually, and at times when there are bag linings still upon the tray, other bag linings, of course, being in contact with the bottom side thereof.

Means are provided to prevent the bags from being pulled out of alignment in the stack when the trays are removed, such means being best illustrated in Fig. 12. A sleeve 32 is slidable on a part of the supporting member S and, if desired, it may be keyed thereon by means of the key 33 suitably attached to the sleeve and riding in a slot 34 in the supporting member. An arm 35 is mounted for vertical pivotal movement on the sleeve 32 by means of a pivot member 36 and, if desired, this may be provided with a stop member 37 whereby the arm 35 may not fall below a desired fixed position. Suitable spring gripping members 38 having toothed or pointed ends 39 are mounted on the arm 35, which are so shaped that they are normally in gripping position and which may be brought out of gripping position by means of a sleeve 40 slidable on the arm 35 and over the gripping members 38 to contact with the bulges 41 thereof to force them together and thus to withdraw the gripping ends from the bag liners. To accommodate the gripping ends 39, the plates 14 are cut away, as at 42, so that the grippers may grip the bags within the rectangular area of the plates without, however, gripping the plates. When it is desired to remove a plate, the gripping ends 39 are caused to take hold of bag linings both above and below the particular plate to be removed, whereby the gripping members tightly hold these bags without so holding the aluminum plate, which may then be removed manually, as previously described. When a plate is to be removed the grippers, with the sleeves 40 over the bulges 38, are brought into position in the cut-away portions 42 of the plate, the sleeves are moved to the left as shown on Fig. 12, whereby the liners above and below the plate are gripped, the plate is pulled out manually, the sleeves 40 are then slid to the right as shown on Fig. 12, and the whole gripping device is then moved bodily away from the pile.

Means are provided to maintain the top 43 of the composite pile at a constant height, irrespective of whether or not bag linings are being removed therefrom. Feelers 44 are mounted on rods 45, the ends of which are provided with screw threads, these rods passing through perforations in an arm 46, and nuts 47, 48 are provided to hold them in adjusted position on the arm. The arm 46 is a member of a bell-crank lever pivotally supported on the supporting frame at 49, this bell-crank lever also having a downwardly projecting arm 50.

A bevel gear 51 is fixed to the shaft 52, while a bevel gear 53 meshing with the bevel gear 51 is fixed to the shaft 54 on which sprockets of the chain elevator are mounted. Fixed to the shaft 52 is a ratchet 55. An eccentric 56 is mounted on the power driven shaft 57, this eccentric being connected by the link 58 to the lever 59 upon which the pawl 60 is mounted at 61 for rotation, this pawl being normally held against the ratchet by the spring 62. The lever 59 is loosely mounted for rotation on the shaft 52. Rotation of the shaft 57 will thus cause a back and forth rotation of the lever 59 which carries the pawl 60.

Normally, this pawl 60 on its upward movement with the lever will cause rotation of the ratchet and it will ride over the teeth of the ratchet on its downward movement, so that normally the shaft 52 is given an intermittent rotating movement in the operation of the machine by the rotation of the driven shaft 57. Loosely mounted on the shaft 52 is a bell-crank lever, one arm 63 of which is pivotally connected at 64 to a bar 65, the other end of which is pivotally connected at 66 to the lower end of the arm 50. The other arm 67 of this bell-crank lever is normally out of contact with the pawl 60, but when the feelers 44 are pushed by the stack of bag liners up to a predetermined height, they will, through operation of the arms 46 and 50, the bar 65, and the arm 63, cause this other arm to be raised up to move the pawl and to hold it out of contact with the ratchet, whereby a continued rotation of the driven shaft 57 will no longer cause operation of the chain elevator. There will thus be a tendency for the pile to remain at a predetermined constant height since, as soon as the top thereof gets slightly above this height, the elevator will cease to operate until bag liners are withdrawn from the top and the feelers 44 move downwardly a corresponding distance, whereupon the arm 67 moves down to release the pawl again to engage it with the ratchet.

Another apparatus similar in all respects to that already described with respect to the bag liners is provided to feed piles of bags 63.

Means is provided to pick the top bag liner off of the pile and to feed it to the machine to be there operated upon, and a similar means is provided to pick the top bag of the pile thereof and likewise to feed it to the machine. These feeding or picking means are similar to each other and therefore only one thereof will be described.

Mounted upon a shaft 69 which in turn is mounted in journals 70 upon the supporting frame, is a drum 71 which rotates with said shaft. The end face of the drum 71 is extended at its edge to form an ear 72 to which an arm 73 is pivotally connected, the outer end of this arm being provided with picker fingers 74 extending generally in the direction of rotation of the drum, as indicated by the arrow on the drawings. The inner end of this arm is provided with a roller 75 which, during part of the revolution of the drum, rides along a track formed by a suitably mounted stationary cam 76, a tension spring 77 being provided to pull this roller against said cam. As the drum rotates, the arm 73 will, of course, rotate therewith, as will the picker fingers 74, but due to the pivotal connection of the arm on the drum and due to the shape of the cam, these picker fingers will be given a very much accelerated forward movement at the proper moment so that the picker fingers will swing about very fast and dig themselves sufficiently into the upper layer of the top bag liner to grasp it, these fingers being so proportioned that they will not at the same time grasp the lower layer of the top bag liner. The bag liner is grasped at the end near its mouth, as shown diagrammatically at the right hand end of Fig. 5, the bag liner being picked up and rotated at such velocity that it is swung open due to the resistance of the air. As the pivot point of the arm on the drum approaches its topmost point, the roller on the arm will ride off of the upper end of the cam 76, thereby imparting to the arm a sudden backward movement, whereby the picker fingers 74 are withdrawn from the bag liner, the mouth of which

has already been swung over a suitable support. This support comprises two pairs of arms 78 and 79 which function as a bag clamping device, the pair of arms 78 being attached to a shaft 80, and the pair of arms 79 to a shaft 81. Fixed to the shaft 80 is a lever arm 82, to the end of which is pivoted a connecting rod 83 at one of its ends and which is provided at its other end with a yoke 84, the arms of which straddle the shaft 69, to which is fixed a cam 86 having a track 87 cut therein, in which a pin 88 fixed to the yoke rides, the shape of this cam being such that the shaft 80 is rotatably reciprocated at the proper time to swing the arms 78, these arms being swung down so that the ends thereof will contact with or be closely adjacent to the ends of the arms 79 at the moment when the mouth of the bag liner is swung thereover, after which the ends of the arms 78 recede from the ends of the arms 79 to stretch the mouth of the bag holder open. The mouth of the bag holder at this time is at the left end of the bag liner.

A similar device, which therefore need not be described in detail, is provided to remove in a similar manner a bag from the pile 68, the drum 71a of this device rotating however, in a direction opposite to that of the rotation of the drum 71 so that the bag is picked up and swung onto and held by the arms 78a and 79a, and the mouth of this bag is at the right end thereof, in order that it may receive the bag liner which was supported on the arms 78 and 79, but which has in the meanwhile been turned inside out. The arms 78, 79, 78a and 79a have, of course, smooth ends which are preferably slightly enlarged.

The means to turn the bag liner comprises a pair of similar sprockets 89 mounted on the same shaft, and a second pair of similar sprockets 90 mounted on the same but different shaft, and a pair of chains 91 runs over these sprockets. A chain 92 runs over sprockets 93 and 94, the sprocket 93 being similar to the sprockets 89, and the sprocket 94 being similar to the sprockets 90, while the chain 92 is similar to the chains 91 with the single exception that the axis of the sprocket 93 is different from that of the sprocket 89 and the axis of the sprocket 94 is similarly different from that of the sprocket 90. Standards 95 are fixedly attached to the chain 92, and similar standards 96 are fixedly attached to the chain 91 nearest the chain 92. Arms 97 are pivotally mounted on these standards so that one end of each arm 97 is pivoted at one end thereof to a standard 95 and at the other end thereof to a corresponding standard 96, as a result of which the arms 97 will move in an orbit similar to that of the chains, but these arms will always remain parallel to each other and will not swing around on passing about the sprockets. In the specific embodiment shown on the drawings these arms 97 always remain upright while traveling through their orbit. Plunger rods 98 are suitably attached to the arms 97 and it is preferred that this attachment be such that these plunger rods bear a fixed relation to such arms. These plunger rods are preferably provided with enlarged smooth rounded ends 99 and with an extension 100 carrying a roller 101. It will now be apparent that the projecting operative ends of the plunger rods 98 will always point in the same direction, namely, to the left as shown on the drawings, throughout their movement through their orbit. Another result of the structure described is that the plunger rods may be maintained in an operative position which is fixed with respect to the axis of the arms 97.

I prefer, however, to provide the rollers 101 and a track for guiding them in order to insure the proper positioning of the plunger rods while they are turning bag liners inside out, transporting such turned bag liners to the bags, inserting them therein and delivering such lined bags to a collecting and stacking device to be described later. As a matter of actual practice, this track 102 need extend only along the lower end of the bight, as shown in Fig. 2, and it has been found preferable to extend the lower of these tracks out a little beyond the entrance end thereof, as shown at the right of this figure. This track is advantageous since the chains are never quite taut and there is therefore generally a tendency for the arms 97 to wobble slightly. Springs 103 and 104 are provided for a purpose to be described hereinafter.

The operation of the elevators being such, as already described, that the top of the pile of bag liners and the top of the pile of bags are each retained automatically in constant operative feeding relation to the picker members, it will now be apparent that the right hand picker member (station A) will pick up a bag lining, open the mouth thereof, and position it on the arms 78, 79, the ends of which are close together, whereupon these ends are separated to hold the bag liner stretched open with its mouth pointing to the left. A plunger rod 98 in its travel strikes against the closed end of this liner, pushing this through the mouth of the bag, while the extended arms 78, 79 retard this motion somewhat by friction on the liner, which aids in the complete reversal without creasing. A partly reversed bag liner is illustrated at station A in Fig. 6, while a completely reversed bag liner as it leaves the arms 78, 79, is illustrated at station A in Fig. 5, and at station B in Fig. 6. A bag liner about to enter a bag is illustrated at station C, Fig. 5, while a completely lined bag is illustrated at station C, Fig. 6.

The spring 103 stretches the lower side of the turned bag liner by frictional contact therewith as it passes station B, and the spring 104 acts similarly on the lined bag at station C, whereby the corners are effectively turned and caused to contact closely with each other.

The completely finished bag, that is, the bag lined with a liner bag which has been turned inside out, is then taken off of the plunger rods 98 and swung around and delivered to fly-rods which pile the bags up in stacks. A series of discs 105, preferably made of wood, are mounted on a shaft 106, the discs having similar cut-away portions 107, ears or lugs 108 thereon projecting into said cut-away portions. Pivoted on the ears 108 are bell-crank levers 109, the arms 110 of which carry a roller 111, while the other arms 112 thereof are bent so that the outer end thereof points in about the same direction as, or about parallel to, the arms 110, these arms 112 being provided at their ends with enlarged bag gripping members 113. A suitably mounted stationary cam 114 is provided, against which the roller 111 rides during a part of the revolution of the discs 105 for a purpose which will appear hereinafter, as will the purpose of the tension spring 115 connected to the discs and to the arm 112.

The discs 105 are so positioned that the ends of the completed bags carried by the plunger rods 98 are received in the cut-away portions 107 of such discs as the discs rotate, at which time the roller 111 contacts with the cam track 114 to cause the ends of the arms 113 to press the ends of the bags against the shoulder of the cut-away

portion of the discs. The end of the bags are thus held fast to the discs as the plunger rods 98 are retracted. The discs rotate rather rapidly so that the bags are pulled around as illustrated at 5 E in Fig. 8, the closed ends thereof being held fast during this rotation due to the shape of the fixed cam. As the roller 111 leaves the end 116 of this cam, the spring 115 pulls the arms 112 away from the bag, allowing it to drop onto the side 117 of the fly-rods 118 to stack up the bags in piles.

A chain 119 is driven from the shaft 120 and actuates the shaft 106. The main driving shaft 57 actuates the shaft 120 by means of bevel gears 15 57a. A cam 121 is mounted on the shaft 120 to rotate therewith. Pivoted to the supporting frame at 122 is an arm 123 connected by a link 124 to the end of a lever 125 fixed to a shaft 126, to which shaft the fly-rods 118 are fixed. A roller 127 on the arm 123 is caused to ride on the cam 121 by a spring 128, and rotation of such cam thereby causes suitable reciprocating rotating movement of the fly-rods. These fly-rods are in the position shown in Fig. 8 at the 20 time a bag is released, and the fly-rods then immediately assume the position shown in Fig. 7, thus stacking up the bags one by one as they are completed.

On Figs. 13 and 14 I have illustrated the form 30 which I prefer of the bag pick-up member. This comprises a strip of metal 201 from which the teeth 202 are struck up. An arm 203 supports this pick-up member and is formed at the lower end thereof to present a groove in which the 35 strip 201 may be placed with suitable fastening, as by means of a screw 204, whereby the pick-up fingers may be easily and quickly assembled with or disassembled from the arm.

The cam track 76 or its equivalent may be made 40 rotatable and means may be provided to hold it in such a position that it will cause the pick-up member to function when directly over the pile of bags, or it may be held in such a position that this pick-up member will go through the 45 same motions when not adjacent the top of the pile of bags. In other words, the position of the cam will determine whether or not the pick-up member will function or not to continue picking up bags.

On Fig. 15 I show the cam track 76 replaced by 50 a cam 205 loosely mounted upon the shaft 69 while attached to this cam is the control arm 206 whereby the cam may be rotated to the desired position. Attached to the arm 206 is a latch member 207 normally held forward by the spring 208 55 in either the slot 209 or the slot 210 in a bar 211, which is supported from the frame-work 212. A handle 213 on the latching member affords means for withdrawing the latch from either of these 60 slots. The two slots 209 and 210 are so positioned that, with the control arm 206 locked in place at one of these slots, the picker arms will be caused to operate in such a position as to pick bags off of the top of the pile consecutively, while with the 65 arm at the other slot the picker member will operate idly.

I have shown and described the preferred embodiment of my invention merely by way of illustration and not as a limitation of the invention, 70 and changes may be made therein without departing from the spirit thereof, the scope of the invention being defined in the appended claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent of 75 the United States is—

1. In a machine of the class described, mechanism comprising teeth and having a continuous movement in one direction throughout the cycle of operations to pick off the top unit of a pile, and mechanism to maintain the top of said pile at a predetermined height as top units are removed. 80

2. In a machine of the class described, mechanism comprising teeth and having a continuous movement in one direction throughout the cycle of operations to pick off the top unit of a pile, and mechanism to maintain the top of said pile in constant relation to said removing mechanism as top units are removed. 85

3. In a machine of the class described, mechanism to raise a stacked pile of units, a feeler member, mechanism operable by said feeler member to throw the raising mechanism out of operation when the top of the pile rises to a predetermined height, and mechanism to replenish 90 said pile, said machine operating continuously on said pile and replenishments. 95

4. In a machine of the class described, mechanism to raise a stacked pile of units, a feeler member, mechanism operable by said feeler member to throw the raising mechanism into operation when the top of the pile falls to a predetermined height, and mechanism to replenish said pile, said machine operating continuously on said pile and replenishments. 100

5. In a machine of the class described, mechanism to raise a stacked pile of units, a feeler member, mechanism operable by said feeler member to throw the raising mechanism out of operation when the top of the pile rises to a predetermined height and to throw said raising member into operation when the top of the pile falls below said height, and mechanism to replenish said pile, said machine operating continuously on said pile and replenishments. 105

6. In a machine of the class described, mechanism to raise a stacked pile of units, a feeler member above said units and adapted to contact with the top unit, mechanism operable by said feeler to throw said raising member out of operation when the top of the pile rises to the feeler member and into operation when the top of the pile falls below said feeler member, and mechanism to replenish said pile, said machine operating continuously on said pile and replenishments. 110

7. In a machine of the class described, mechanism to pick the top bag of a pile of bags off of said pile, and mechanism to cause said picking mechanism to operate to pick up a bag and whirl 115 it around with such speed as to cause the mouth of the bag to open. 120

8. In a machine of the class described, mechanism to hold a bag open, and mechanism to grasp a bag and whirl it around at such speed as to cause 125 the mouth of the bag to open and to place the bag over said holding mechanism. 130

9. In a bag turning and lining machine, mechanism to hold a bag open, mechanism to grasp a bag and whirl it around at such speed as to cause the mouth of the bag to open and to place the bag over said holding mechanism, and mechanism to turn said bag inside out. 140

10. In a bag turning and lining machine, mechanism to hold a bag open, mechanism to grasp a bag and whirl it around at such speed as to cause the mouth of the bag to open and to place the bag over said holding mechanism, and mechanism to turn said bag inside out and to remove said turned bag. 145

11. In a bag turning and lining machine, a holding mechanism for an open bag comprising two normally separated arms, and a mechanism having a continuous motion in one direction throughout the cycle of operations to pick the top bag of a pile of bags off of said pile, open it, and position it open over said arms.

12. In a bag turning and lining machine, mechanism to pick the top bag of a pile of bags off of said pile and to open the mouth of said bag, comprising a rotating member, an arm pivoted thereon, a stationary cam, said arm riding along said cam, and a picker member on said arm.

13. In a bag turning and lining machine, mechanism to pick the top bag of a pile of bags off of said pile and to open the mouth of said bag, comprising a rotating member, an arm pivoted thereon, a stationary cam, said arm riding along said cam, and a picker member on said arm, said picker member comprising a set of pins pointed in the direction of rotation of said rotating member.

14. In a bag turning and lining machine, mechanism to pick the top bag of a pile of bags off of said pile and to open the mouth of said bag, comprising a rotating member, an arm pivoted thereon, a stationary cam, one end of said arm riding along said cam, and a picker member at the other end of said arm, said cam being so shaped that the picker member will release the bag at a predetermined point in the rotation of said rotating member.

15. In a machine of the class described, mechanism to pick the top bag of a pile of bags off of said pile and to open the mouth of said bag, comprising a rotating member, an arm pivoted thereon, a stationary cam, said arm riding along said cam, and a picker member on said arm, said cam being so shaped that the picker member will pick up a bag at a predetermined point in the rotation of said rotating member.

16. In a machine of the class described, mechanism to pick the top bag of a pile of bags off of said pile and to open the mouth of said bag, comprising a rotating member, an arm pivoted thereon, a stationary cam, said arm riding along said cam, and a picker member on said arm, said cam being so shaped that the picker member will pick up a bag at a predetermined point in the rotation of said rotating member and release said bag at another predetermined point in the rotation of said rotating member.

17. In a bag turning and lining machine, mechanism to pick the top bag of a pile of bags off of said pile and to open the mouth of said bag, comprising a rotating member, an arm pivoted thereon, a stationary cam, one end of said arm riding along said cam, and a picker member at the other end of said arm, said picker member comprising a set of pins pointed in the direction of rotation of said rotating member, said cam being so shaped that the picker member will release the bag at a predetermined point in the rotation of said rotating member.

18. In a bag turning and lining machine, mechanism to pick the top bag of a pile of bags off of said pile and to open the mouth of said bag, comprising a rotating member, an arm pivoted thereon, a stationary cam, one end of said arm riding along said cam, and a picker member at the other end of said arm, said picker member comprising a set of pins pointed in the direction of rotation of said rotating member, said cam being so shaped that the picker member will pick up a bag at a

predetermined point in the rotation of said rotating member.

19. In a bag turning and lining machine, mechanism to pick the top bag of a pile of bags off of said pile and to open the mouth of said bag, comprising a rotating member, an arm pivoted thereon, a stationary cam, one end of said arm riding along said cam, and a picker member at the other end of said arm, said picker member comprising a set of pins pointed in the direction of rotation of said rotating member, said cam being so shaped that the picker member will pick up a bag at a predetermined point in the rotation of said rotating member and release said bag at another predetermined point in the rotation of said rotating member.

20. In a bag turning and lining machine, relatively movable arms, a set of sprockets, a chain member thereon, another set of sprockets, another chain member thereon, said other set of sprockets being similar to the first set and spaced the same distance apart, the axes of the sprockets of said other set being out of line with the axes of the sprockets of said first set, whereby the chains will run parallel to each other, a rigid member pivotally attached to the chains, and a projecting arm fixedly attached to said rigid member, said first mentioned arms being so positioned that said last mentioned arm will pass therebetween to reverse a bag thereon and remove it therefrom.

21. In a bag turning and lining machine, relatively movable arms, a pair of sprockets, a chain member thereon, another pair of sprockets, another chain member thereon, said other pair of sprockets being similar to the first pair and spaced the same distance apart, the axes of said second pair of sprockets being out of line with the axes of said first pair of sprockets whereby the chains will run parallel to each other, a rigid member pivotally attached to the two chains, and a projecting arm fixedly attached to said rigid member whereby said projecting arm always points in the same direction with respect to its point of attachment to said rigid member, said first mentioned arms being so positioned that said last mentioned arm will pass therebetween to reverse a bag thereon and remove it therefrom, and mechanism to retard the movement of the bag while on said projecting arm.

22. In a machine of the class described, a set of sprockets, a chain member thereon, another set of sprockets, another chain member thereon, said second set of sprockets being similar to the first set and spaced the same distance apart, the axes of said second set of sprockets being out of line with the axes of said first set whereby the chains will run parallel to each other, a rigid member pivotally attached to the two chains, and a projecting arm fixedly attached to said rigid member whereby said projecting arm always points in the same direction with respect to its point of attachment to said rigid member.

23. In a machine of the class described, a set of sprockets, a chain member thereon, another set of sprockets, another chain member thereon, said second set of sprockets being similar to the first set and spaced the same distance apart, the axes of said second set of sprockets being out of line with the axes of said first set whereby the chains will run parallel to each other, a rigid member pivotally attached to the two chains, a projecting arm fixedly attached to said rigid member whereby said projecting arm always points in the same direction with respect to its

point of attachment to said rigid member, and mechanism to maintain the directional position of said arm if a chain is loose.

24. In a machine of the class described, a set of sprockets, a chain member thereon, another set of sprockets, another chain member thereon, said second set of sprockets being similar to the first set and spaced the same distance apart, the axes of said second set of sprockets being out of line with the axes of said first set whereby the chains will run parallel to each other, a rigid member pivotally attached to the two chains, a projecting arm fixedly attached to said rigid member whereby said projecting arm always points in the same direction with respect to its point of attachment to said rigid member, a pair of tracks, and a member on said arm sliding between said tracks.

25. In a bag turning and lining machine, in combination, mechanism to pick up a bag, mechanism to pick up a bag liner, and mechanism movable in a closed path to insert said bag liner in said bag.

26. In a bag turning and lining machine, a mechanism to receive and hold open bags, comprising a plurality of groups of projecting rods, mechanism to cause said rods of a group to approach one another when a bag is to be received thereon and to recede one from another when a bag is to be held thereon, and mechanism to move rods of another group successively between and past said rods of said first mentioned group.

27. In a bag turning and lining machine, a mechanism to receive and hold open bags, comprising projecting rods having free ends, mechanism to cause said free ends to approach one another when a bag is to be received thereon and to recede one from another when a bag is to be held thereon, and mechanism to move a plurality of rods successively and continuously between and past said first mentioned rods.

28. In combination with a bag machine presenting a bag on a projecting rod, a mechanism to remove said bag from said rod, and mechanism to cause said rod and removing mechanism to approach one to the other, more generally in the same direction, and then to recede one from the other.

29. In combination with a bag machine presenting a bag on a projecting rod, a rotary mechanism to pull said bag off of said rod, and mechanism to cause said rod to approach said rotating mechanism and to undergo a rotational movement corresponding reversely thereto.

30. In a bag turning and lining machine, mechanism to pick the top bag of a pile of bags off of said pile comprising a rotating member, an arm pivoted thereon, a cam, said arm riding along said cam, a picker member on said arm, and means to rotate said cam and to hold it in either operative or inoperative position.

31. In an automatic bag turning and lining machine, mechanism to hold a bag open, mechanism to hold a liner away from said bag, and mechanism to cause one of said mechanisms to move toward the other to line said bag with said liner.

32. In an automatic bag turning and lining machine, mechanism to hold a bag open at a station, mechanism to turn a liner inside out at another station and to hold said turned liner, and mechanism to cause relative approach between said first two mentioned mechanisms to line said bag with said liner.

33. In an automatic bag turning and lining machine, mechanism to hold a bag open at a station, mechanism to hold a liner at another station, and mechanism to move one of said first two mentioned mechanisms toward and past the other thereof to line said bag with said liner and to remove the resulting lined bag.

34. In an automatic bag turning and lining machine, mechanism to hold open a bag having a mouth and a closed end, mechanism comprising an arm pointed toward said mouth, said arm being adapted to carry a liner having a mouth and a closed end with said closed end pointed toward said bag mouth, and mechanism to move said arm into said bag mouth and past said bag-holding mechanism to line said bag with said liner and to support the resulting lined bag.

35. In an automatic bag turning and lining machine, mechanism to pick up bags, mechanism to pick up liners, mechanism movable in a closed path to insert said liners in said bags and to support the resulting lined bags, and mechanism to grasp said lined bags and to remove them from said supporting mechanism.

36. In an automatic bag machine, a projecting rod for presenting a bag thereon, a stacking mechanism, rotatable mechanism to remove said bag from said rod, and mechanism to rotate said rotatable mechanism at a speed sufficient to present said bag flat side foremost to said stacking mechanism.

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