United States Patent [19]

Spencer

[11] **3,842,568**

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[54] **METHOD OF PACKAGING FLEXIBLE PLASTIC BAGS**

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[73] Assignee: **Paper Converting Machine Company,** Green Bay, Wis.

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[52] **U.S. Cl.** ..... **53/21 FW,** 53/118

[51] **Int. Cl.** **B65b 63/04**

[58] **Field of Search** ..... 53/21 FW, 118, 119

[56] **References Cited**

UNITED STATES PATENTS

2,871,638	2/1959	Goodwin	53/119 X
1,771,869	7/1930	Baldenhofer	53/118 X

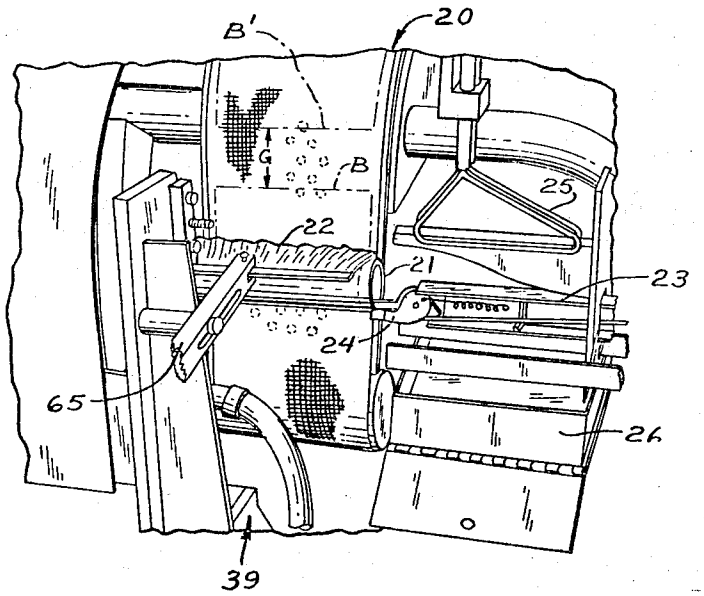
Primary Examiner—Travis S. McGehee

Attorney, Agent, or Firm—Dawson, Tilton, Fallon & Lungmus

[57] **ABSTRACT**

A method for packaging flexible plastic bags of substantial size (such as refuse bags for leaves) wherein the bags are advanced sequentially along a predetermined path and successively reeled on themselves about a pair of rotating mandrels, the mandrels being oscillated together so as to alternately come into positions of approximate tangency to the predetermined path and alternately, a position where the reeled bag is stripped, and, after stripping in a direction transverse to the predetermined path, the stripped bag is tamped into a carton – whereby each bag is essentially flat folded independently of the other bags in the carton.

11 Claims, 15 Drawing Figures



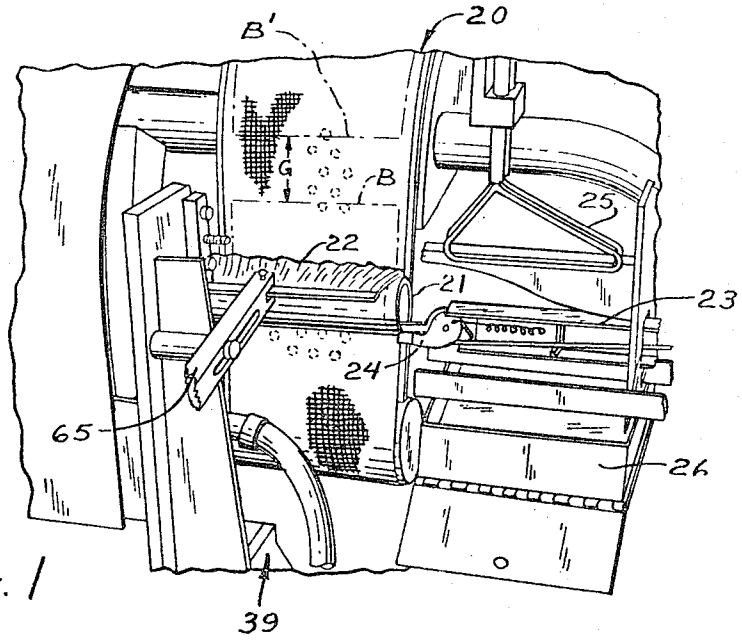


Fig. 1

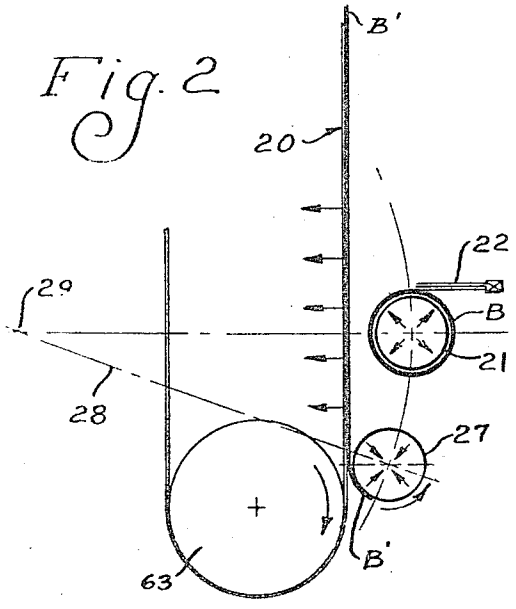


Fig. 2

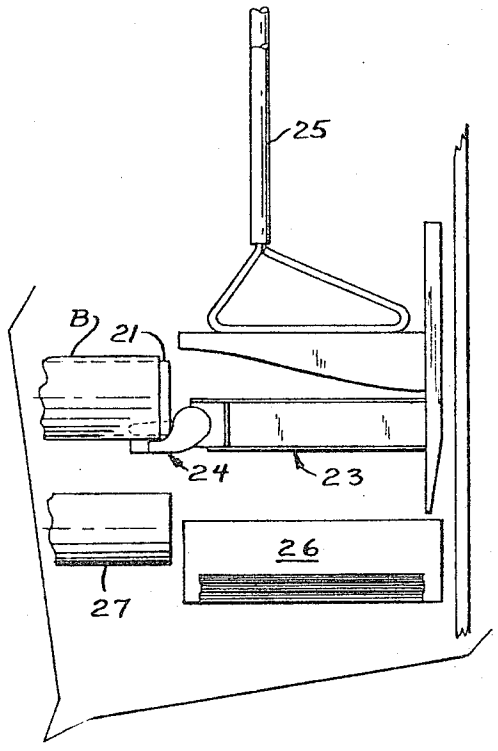
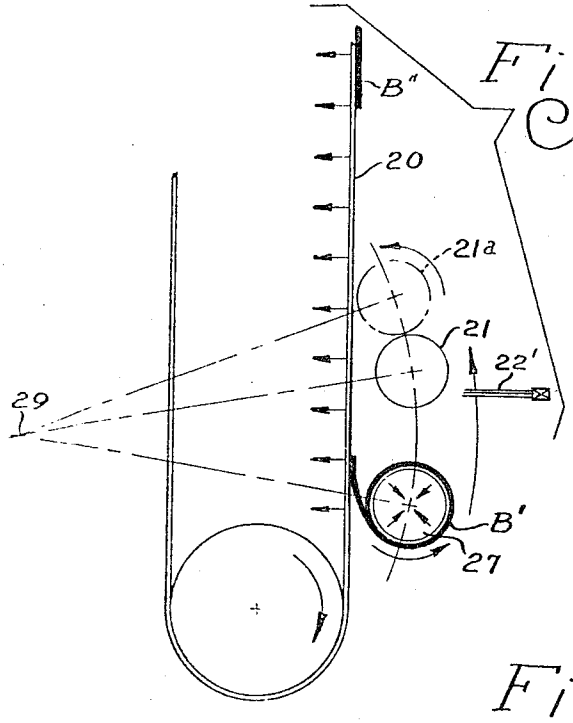


Fig. 3

Fig. 4



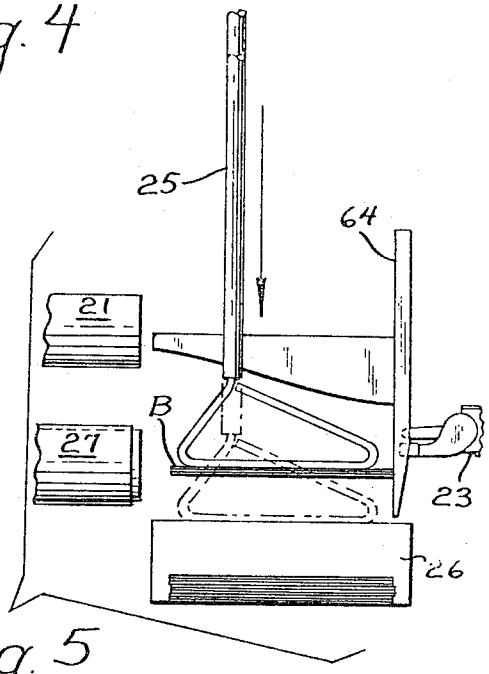
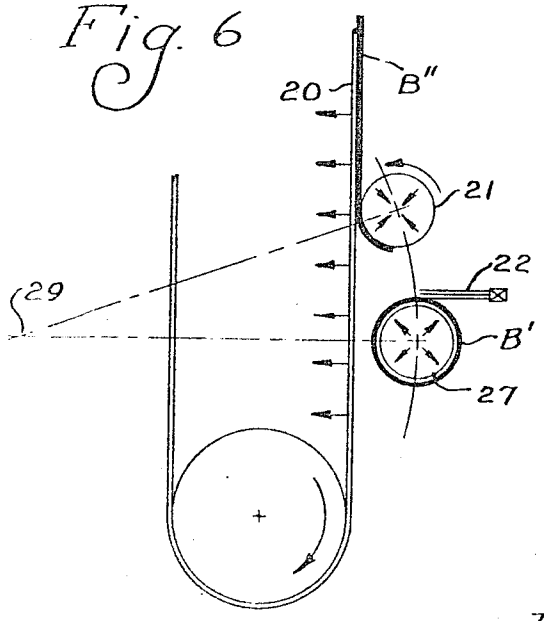


Fig. 5

Fig. 6



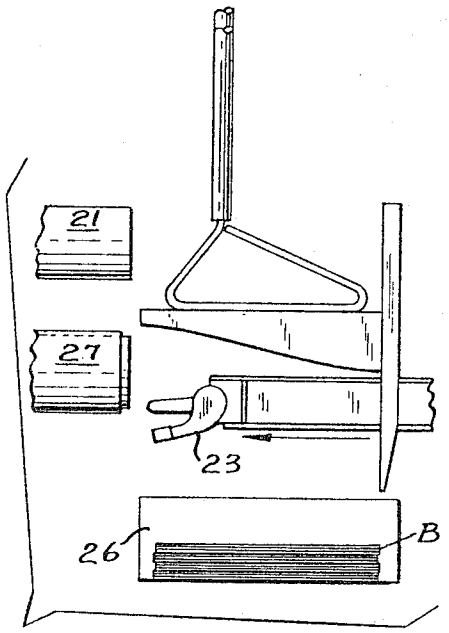


Fig. 7

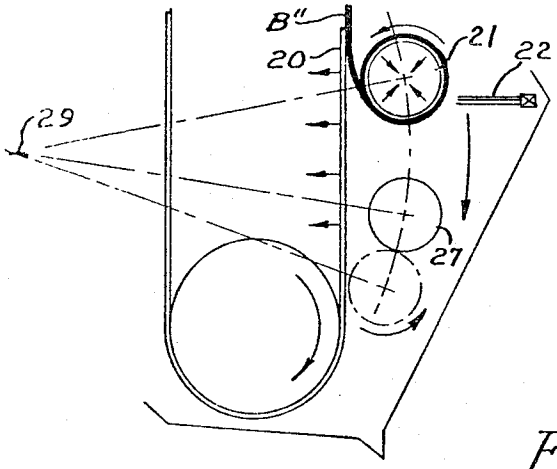


Fig. 8

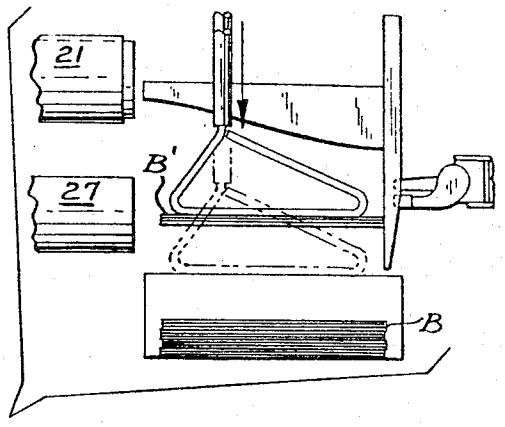


Fig. 9

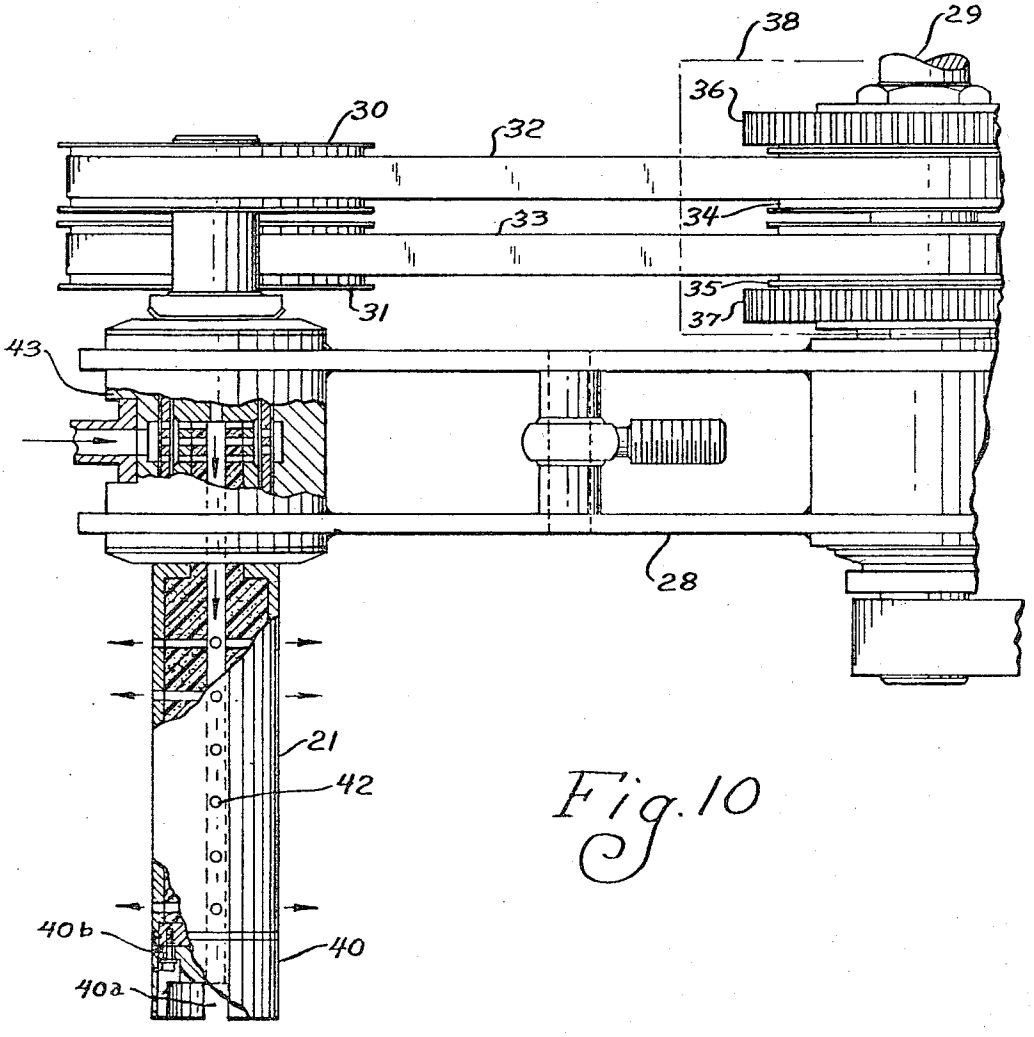


Fig. 10

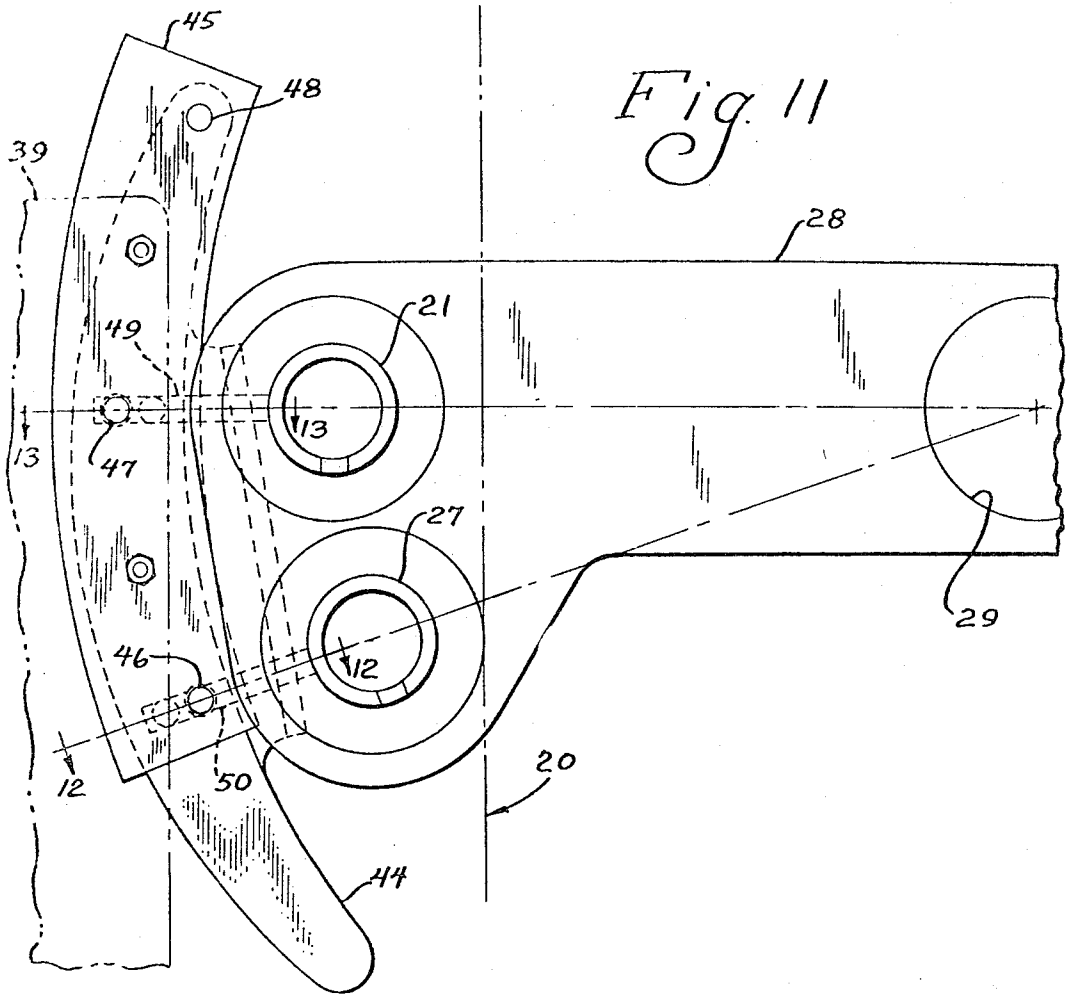
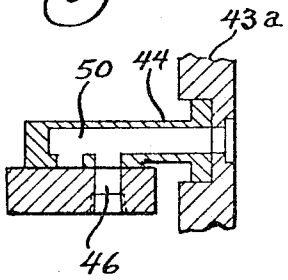


Fig. 11

Fig. 12



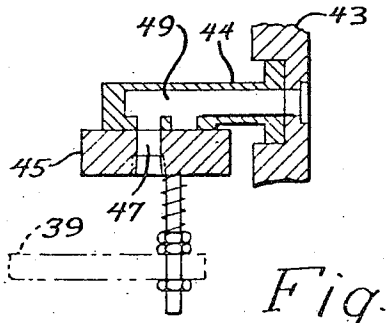


Fig. 13

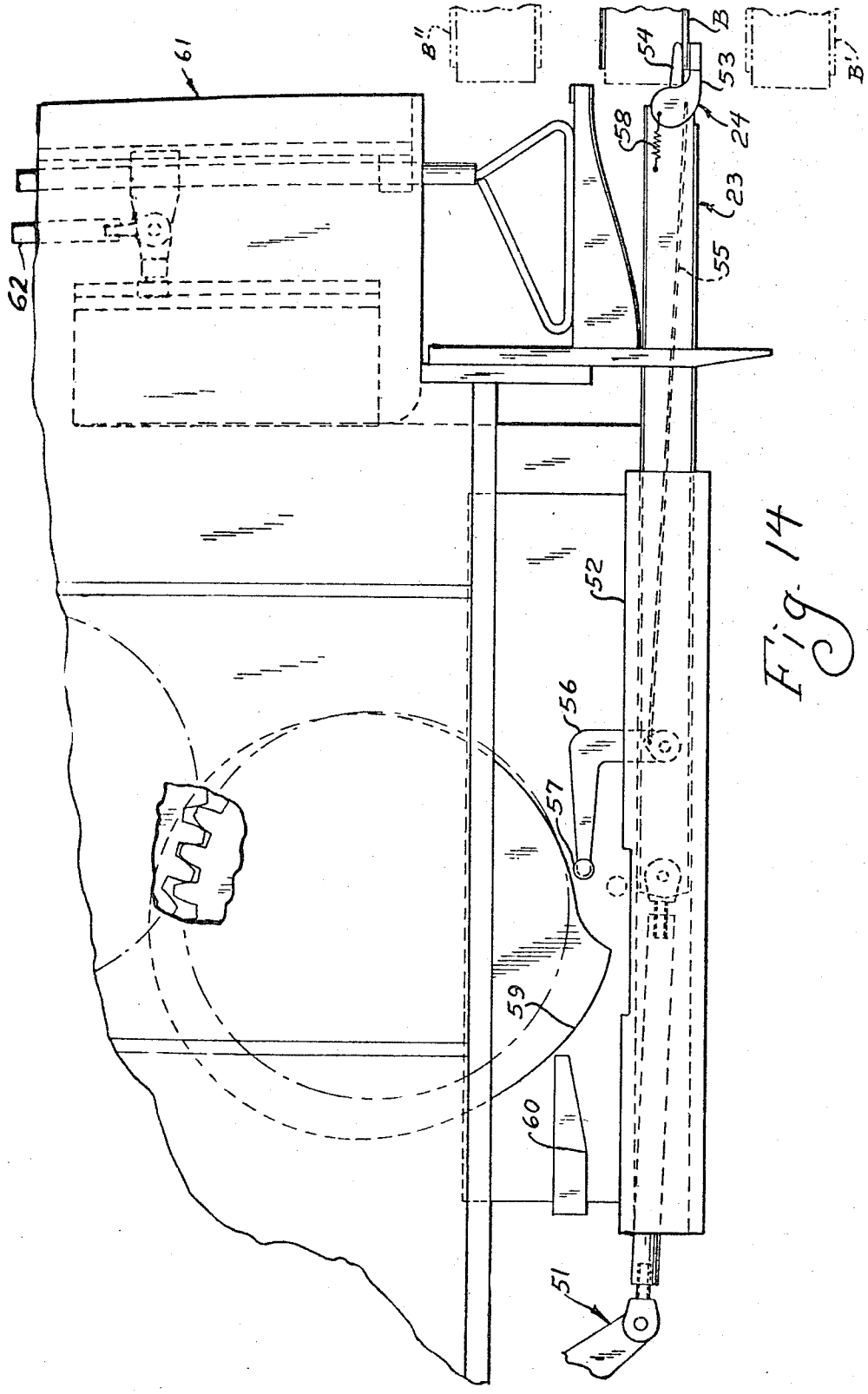


Fig. 14

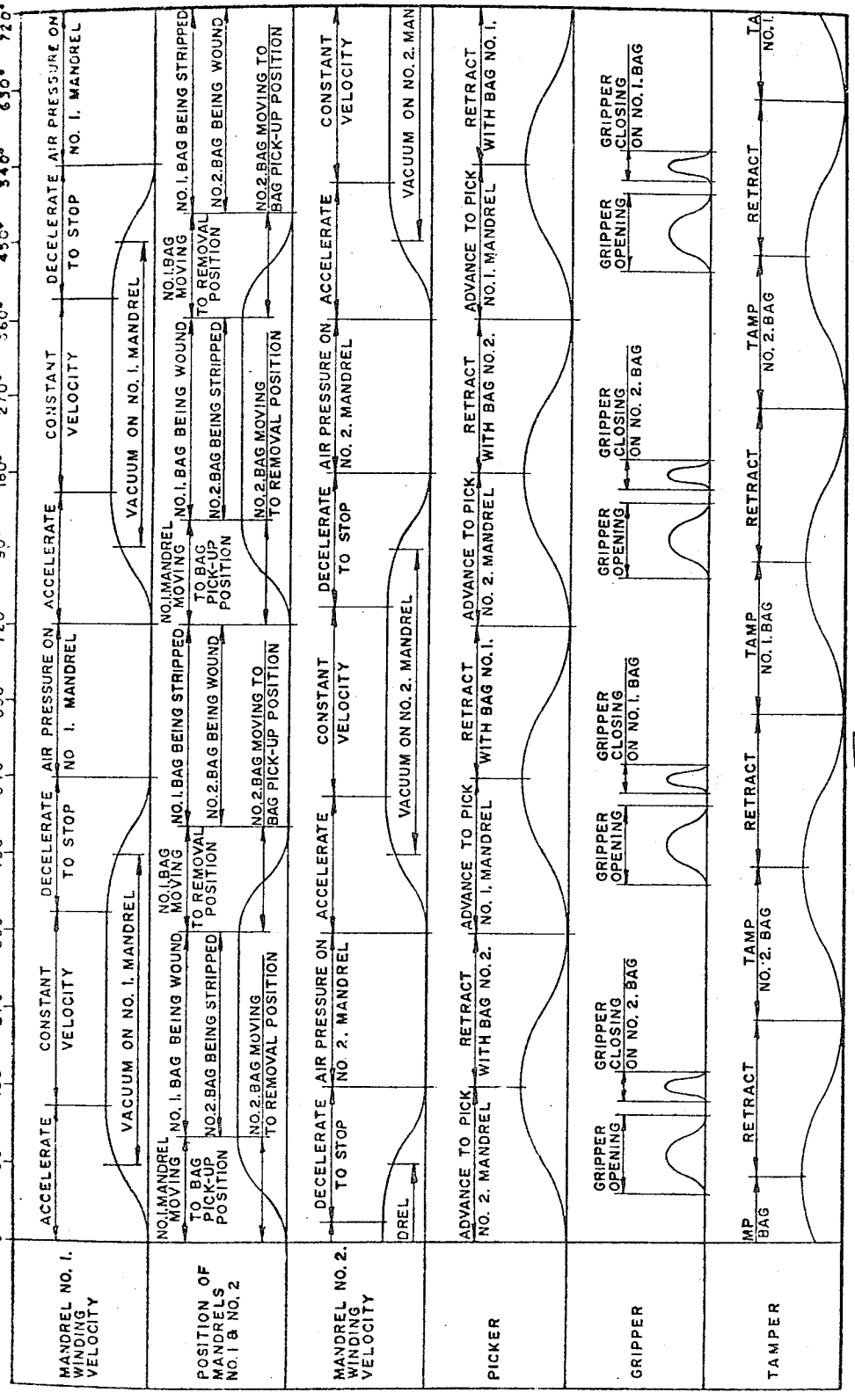

0
90°
180°
270°
360°
450°
540°
630°
720°
90°
180°
270°
360°
450°
540°
630°
720°
MANDREL NO. 1. WINDING VELOCITY
ACCELERATE
CONSTANT VELOCITY
DECELERATE TO STOP
AIR PRESSURE ON NO. 1. MANDREL
ACCELERATE
CONSTANT VELOCITY
DECELERATE TO STOP
AIR PRESSURE ON NO. 1. MANDREL
VACUUM ON NO. 1. MANDREL
VACUUM ON NO. 1. MANDREL
POSITION OF MANDRELS NO. 1 & NO. 2
NO. 1. MANDREL MOVING TO BAG PICK-UP POSITION
NO. 1. BAG BEING WOUND
NO. 1. BAG MOVING TO REMOVAL POSITION
NO. 2. BAG BEING STRIPPED
NO. 2. BAG MOVING TO BAG PICK-UP POSITION
NO. 1. BAG BEING STRIPPED
NO. 1. BAG MOVING TO REMOVAL POSITION
NO. 2. BAG BEING WOUND
NO. 2. BAG MOVING TO REMOVAL POSITION
NO. 1. BAG BEING STRIPPED
NO. 1. BAG BEING WOUND
NO. 2. BAG MOVING TO BAG PICK-UP POSITION
NO. 1. MANDREL MOVING TO BAG PICK-UP POSITION
MANDREL NO. 2. WINDING VELOCITY
DECELERATE TO STOP
AIR PRESSURE ON NO. 2. MANDREL
ACCELERATE
CONSTANT VELOCITY
DECELERATE TO STOP
AIR PRESSURE ON NO. 2. MANDREL
ACCELERATE
CONSTANT VELOCITY
VACUUM ON NO. 2. MANDREL
VACUUM ON NO. 2. MANDREL
PICKER
ADVANCE TO PICK NO. 2. MANDREL
RETRACT WITH BAG NO. 2.
ADVANCE TO PICK NO. 1. MANDREL
RETRACT WITH BAG NO. 1.
ADVANCE TO PICK NO. 2. MANDREL
RETRACT WITH BAG NO. 2.
ADVANCE TO PICK NO. 1. MANDREL
RETRACT WITH BAG NO. 1.
GRIPPER
GRIPPER OPENING
GRIPPER CLOSING ON NO. 2. BAG
GRIPPER OPENING
GRIPPER CLOSING ON NO. 1. BAG
GRIPPER OPENING
GRIPPER CLOSING ON NO. 2. BAG
GRIPPER OPENING
GRIPPER CLOSING ON NO. 1. BAG
TAMPER
TAMP NO. 2. BAG
RETRACT
TAMP NO. 1. BAG
RETRACT
TAMP NO. 2. BAG
RETRACT
TAMP NO. 1. BAG

Fig. 15

METHOD OF PACKAGING FLEXIBLE PLASTIC BAGS

BACKGROUND AND SUMMARY OF INVENTION

Where refuse bags of substantial size are prepared for marketing, a problem has arisen in packaging. A simple expedient employed previously has been to fold the bags (usually six to 12) simultaneously so that the bags are interfolded. Although this is simple from the standpoint of production, it has caused considerable trouble in use — the user often virtually destroying the package in order to get a single bag out free of the others. On the other hand, it has been found expensive and time consuming to fold the bags independently and insert them into the retail carton.

According to the instant invention, these twin difficulties are avoided and this through the use of a high speed mechanism which rapidly winds or reels each bag on itself in after which the bag is translated, i.e., stripped from the winding mandrel into a position over the receiving carton. Thereafter the bag in its reeled condition is tamped into the receiving carton and incident to this becomes flattened so that it has the desired configuration of being "flat folded."

DETAILED DESCRIPTION OF THE INVENTION

The invention is depicted in conjunction with an illustrative embodiment including apparatus, for the practice thereof and in which:

FIG. 1 is a fragmentary perspective view of apparatus employed for the practice of the invention;

FIG. 2 is a schematic view of the apparatus of FIG. 1 in a first operational condition;

FIG. 3 is a side elevational view, also essentially schematic, of the configuration of apparatus of FIG. 2;

FIS. 4 and 5 are schematic views corresponding essentially to the depictions in FIGS. 2 and 3 but wherein the apparatus is in a subsequent operational state;

FIGS. 6–7 and FIGS. 8–9 are views corresponding respectively to FIGS. 2–3 and 4–5 but showing the apparatus in third and fourth operational states;

FIG. 10 is a fragmentary plan view of the apparatus and which is particularly concerned with the drive for the mandrels;

FIG. 11 is a side elevational view of the air system components associated with the mandrels for facilitating reeling and stripping;

FIGS. 12 and 13 are fragmentary sectional views taken along the lines 12—12 and 13—13 respectively in FIG. 11;

FIG. 14 is an end elevational view of the inventive apparatus and shows particularly the means for actuating the devices employed for stripping and tamping; and

FIG. 15 is a plural graph chart showing the timed relationship of the various steps employed in the practice of the invention according to the preferred form shown herein.

In the illustration given and with particular reference to FIG. 1, the numeral 20 designates generally a conveyor which is seen to support bags B and B′ which are located in longitudinally spaced apart relation — as by a gap therebetween. The development of this gap is described in greater detail hereinafter. Essentially it stems from the fact that the bags are reeled faster than they are advanced on the conveyor 20.

Advantageously, the conveyor 20 is of the vacuum type consisting of a screen or foraminous belt sliding over an apertured suction box. Upstream of the portion of the conveyor 20 shown in FIG. 1 are located conventional folding and cutoff devices (not shown).

In FIG. 1, only one mandrel 21 is shown to facilitate quick understanding of the operation of the inventive method. It will be appreciated that in the preferred form of the invention as depicted in the remaining figures of the drawing, a pair of mandrels are provided.

Mounted in juxtaposition to the mandrel 21 is a brush 22 which is adapted to hold down the trailing end of a bag B being reeled on the mandrel 21. After the reeling has been completed, a picker mechanism 23 advances coaxially relative to the mandrel 21 (advancing to the left in FIG. 1). A gripper 24 is provided on the adjacent end of the picker 23 which is adjacent the mandrel 21 and grips an edge portion of the bag B after the same has been completely reeled. Retraction of the picker mechanism 23 positions the reeled bag under a tamper 25 which reciprocates in a direction parallel to the predetermined path of the conveyor 20 and tamps the reeled bag into a carton 26 — and incident thereto flattens the same so as to develop the desired flat folded configuration of bag.

Turning now to FIGS. 2–9, it will be seen that a second mandrel 27 is depicted schematically and that both the mandrels 21 and 27 are rotatably mounted on a mandrel pivot arm 28 which is rockably mounted on a cross shaft 29 (also depicted schematically but which will be described hereinafter with reference to FIG. 10). In FIG. 2 it is to be noted that the bag B has been completely reeled whereas in FIG. 1 the bag B is still in the process of being wound.

In FIGS. 4 and 5, a subsequent stage of operation is shown where the bag B previously wound on the mandrel 21 has been stripped therefrom and is ready for tamping into the carton C. Meanwhile the bag B′ has been almost wound on the mandrel 27. The mandrels are shown in the process of being indexed, i.e., oscillated to move the mandrel 21 upwardly into tangency (as at 21a in FIG. 4) with the conveyor 20. The mandrel 27 is also shown in a position intermediate the ends of its oscillatory path — no longer being approximately tangent to the conveyor 20 as it was in FIG. 2 but not quite in the stripping position — as it is in FIG. 6.

In FIGS. 6 and 7, the mandrel positions are the reverse of that seen in FIGS. 2 and 3 while in FIGS. 8 and 9, the positions are reversed from that of FIGS. 4 and 5. Thus, a given cycle of operation includes reeling of one mandrel while stripping the second, moving the wound mandrel to the stripping position while moving the stripped mandrel to the winding position, reeling the second mandrel while stripping the first, and finally moving the second to the stripping position while moving the first back to the winding position. The stripping positions for both mandrels is the same (compare FIGS. 2 and 6) while the winding positions are different — athough in both cases there is approximate tengency to the conveyor 20 (again compare FIGS. 2 and 6).

Reference is now made to FIG. 10 for additional details of preferred mechanism for achieving the inventive method. In FIG. 10, pulleys 30 and 31 are mounted on the mandrels 21 and 27 respectively and through drives 32 and 33, respectively, derive rotational power from pulleys 34 and 35. The pulleys 34 and 35 are fixed to the cross shaft 29 and are coupled, respectively to gears 36 and 37. It will be appreciated that input to the gears 36 and 37 can be achieved from a variety of in-

dexing mechanisms and for that purpose one such is schematically represented by the numeral **38,** this, along with the cross shaft **29** being operatively associated with the frame generally designated **39** (see FIG. **1**).

Still referring to FIG. **10,** it will be seen that the unsupported or stripping end of the mandrels is equipped with an end portion **40** having a cutout **40a** which provides an unsupported portion of the reeled bag for gripping by the gripper **24.** Arcuate slots in the end portion **40** permit rotary adjustment of the end portion **40** (via bolts **40b**) so that the cutout **40***a* is properly aligned with the gripper **24.**

It will also be noted that the mandrels **21** and **27** are equipped with air passages or apertures **42** which are adapted to be in confronting relation with the innermost convolution or wrap of a bag being reeled. The air passages **42** communicate with an air manifold **43,** the purpose of which is to selectively apply vacuum or pressure to a given mandrel. At the beginning of a reeling cycle, the air passages **42** are subjected to vacuum, i.e., the air pressure therein is reduced to below atmospheric so as to cause the bag to be readily transferred from the conveyor **20** to the mandrel in the winding position, viz., the position of the mandrel **27** in FIG. **2.** Toward the end of the reeling cycle, the mandrel has the air passages thereof subjected to air pressure, i.e., to a pressure greater than atmospheric so as to facilitate the stripping of the reeled bag axially off of the mandrel. The pressure air flowing out of the passages **42,** in effect, provides a lubricant facilitating the stripping movement.

For the purpose of selectively applying vacuum and pressure to mandrels, the mandrel pivot arm **28** is equipped with a banana-shaped fitting **44** (see FIG. **11**) which is coupled to the two air manifolds **43** and **43a** associated with the mandrels **21** and **27.** The fitting **44** is in sliding, generally sealed relationship with a stationary manifold plate **45** resiliently attached to the frame **39** (see FIG. **13**). The plate **45** has bores **46–48** provided therein. The bores **46** and **48** are coupled to a source of vacuum (not shown) while the intermediate bore **47** is coupled to a source of compressed air (also not shown). Thus, as the mandrels oscillate over an arcuate path, one mandrel is coupled to a vacuum (when that particular mandrel is in the reeling position) while the other mandrel is coupled to a source of compressed air — while that mandrel is in the stripping position. It will be noted that both mandrels assume the same position for stripping, the stripping position being intermediate the ends of the arcuate path which brings the respective mandrels into approximate tangency with the conveyor **20.** For the purpose of communicating the pressure or vacuum from the stationary manifold plate **45,** the fitting **44** is equipped with bores **49** and **50** as can be seen best in FIGS. **12** and **13.** As seen in FIGS. **11–13,** the mandrel **21** is in the stripping position, i.e., away from the conveyor **20.** Its associated bore **49** in the fitting **44** is aligned with the pressure passage **47.** The mandrel **27** is in the reeling position, i.e., generally tangent to the conveyor **20.** Its associated bore **50** in the fitting **44** is aligned with the vacuum passage **46.** When the mandrel **21** is in the reeling position, the bore **49** is aligned with the vacuum passage **48** and the bore **50** associated with the mandrel **27** is aligned with the pressure package **47.**

Before going on with the remainder of the description of the preferred form of mechanism for practicing the invention, reference is made to FIG. **15** which includes a plurality of graphs setting forth the timed relationship of the various steps and apparatus employed. The uppermost graph is seen to be designated mandrel No. **1** winding velocity and has to do with the surface speed of the mandrel **21.** The third curve from the top shows the pattern of velocity or surface speed changes in the other mandrel **27** (designated No. **2** mandrel).

Referring to the curve for mandrel No. **1,** it will be seen that at the start of a given cycle, the velocity increases from zero to a maximum which occurs about one-eight to one-quarter through a total cycle. The graphs in FIG. **15** have been set up so that one cycle includes (1) the reeling of one bag, (2) the movement of the mandrel on which that bag has been reeled to the stripping position, (3) the dwell time in the stripping position and (4) the return of the mandrel to a position for reeling a third bag — it being appreciated that the second bag is being reeled on the second mandrel during the stripping of the first bag from the first mentioned mandrel.

Thus, it will be seen that the third curve shows no rotational velocity of the mandrel No. **2** during the time mandrel No. **1** is in the winding mode. Referring again to the topmost curve in FIG. **15,** it will be seen that there is a constant velocity or surface speed of the mandrel No. **1** for a substantial portion of the cycle. This speed is set to be slightly faster than the linear speed of the conveyor **20** so that the outer convolutions of the reeled bag are relatively tight. However, the speed at pickup is somewhat slower than the linear speed of the conveyor **20.** This insures that the innermost convolution or the first wrap around the mandrel will be relatively loose so as to insure easy removability. Reeling of the bag generally completes as the mandrel No. **1** reaches the deceleration portion of its rotation — approximately the third quarter of the cycle.

The gap G is developed between the bags B and B′ on the vacuum belt of the conveyor **20** because the mandrels wind at a rate greater than the rate the bags are being carried on the conveyor **20.** The indexing device **38** driving the mandrels provides an acceleration period, a constant velocity period, a deceleration period, and a non-rotational period. More particularly, the bags are picked up by the vacuum in the reeling mandrel during the acceleration period, but at a point where the velocity of the surface of the mandrel is below the velocity of the bag on the conveyor **20.** This allows each bag to be picked up without tension on the bag. Pickup occurs after the time vacuum is applied but before the mandrel reaches its constant velocity mode. After each bag has made approximately one wrap or convolution and is firmly gripped by the mandrel, the velocity of the surface of the mandrel continues to increase to a value greater than the velocity of the vacuum belt conveyor **20** and the bag is caused to slip on the conveyor **20** to pull the bag being wound ahead of the next bag in the stream. Since the constant velocity period of rotation of the mandrel is at a greater velocity than the vacuum belt velocity, the bags are wound under tension for all but the first revolution of the wind. The diameter of the mandrel, the number of convolutions of wind and the pickup point are all designed to position the tail of the bag on top of the mandrel under

the wiper brush **22** when the mandrel stops rotating in the strip position.

Referring now to the second curve (counting from the top of FIG. **15**) the position of both the mandrels No. **1** and **2** are depicted. The various positions are labeled and it will be seen that during the first approximately 120° of a given 720° cycle, the mandrel No. **1** is moving to the pickup position. Thereafter for about 240°, the mandrel No. **1** is in a dwell position for the winding or reeling of a bag. The next approximate 120° sees the mandrel being indexed to the strip or removal position, after which there is another substantial dwell period of about 240° for the actual stripping of the reeled bag from the mandrel.

Also indicated on the first and third curves are the conditions of pressure or vacuum on the two mandrels. The vacuum condition exists relative to the apertures **42** during the entire winding or reeling portion of the cycle — for so long as the mandrel **21** is in the wind position because at that time the bore **49** is aligned with the passage **48.** After the mandrel **21** has the bag B reeled upon it and has been indexed almost to the strip position, the bore **49** in the fitting **44** is aligned with the intermediate bore **47** so as to deliver compressed air to the passages **42.** Thus, for a short period before and after reeling, the mandrel is subjected to vacuum while the mandrel is subjected to air pressure for a period shortly before and during the stripping.

Turning now to FIG. **14,** the numeral **51** generally designates the actuator for the picker mechanism **23.** It will be appreciated that the picker mechanism is essentially a reciprocating mechanism which moves the gripper **24** into and out of engagement of a cantilevered edge portion of the reeled bag. For this purpose, the picker is slidably received within a guide **52.**

The numeral **53** designates the movable jaw of the gripper **24** while the numeral **54** designates the stationary jaw. The movable jaw **53** is coupled by means of a cable **55** to a cam follower arm **56** which carries a cam follower **57.** The cam follower arm is seen to be mounted on the picker mechanism **23** and moves therewith. Normally, the movable jaw **53** is urged into gripping contact with the stationary jaw **54** by means of a tension spring **58** extending between the jaw **53** and a spaced portion on the picker mechanism **23.** However, as the picker mechanism advances axially toward the mandrel in the stripping position, the cam follower **57** comes into contact with a rotating cam **59.** The rotating cam **59** is programmed so that just as the gripper **24** is about to engage the edge of the reeled bag, the cam follower arm **55** is rocked so as to temporarily open the jaws **53–54.** Thereafter, the jaws snap shut about a portion of the reeled bag and remain in that position until the picker mechanism **23** is virtually completely retracted, i.e., until the cam follower **57** engages a fixed cam surface **60.** This results in opening the jaws **53–4** so that the tamper **25** can perform its function in separating now stripped reeled bag from the gripper **24** and into the carton **26.**

The timed sequence of the picker mechanism **23** and gripper **24** are seen on the fourth and fifth curves (counting from the top) of FIG. **15.** It will be appreciated that each of these functions is performed twice each cycle of 720° as designated. Thus, as the mandrel No. **1** has been indexed to the stripping position (reaching that at about 480°) the picker mechanism **23** is almost adjacent the end of the mandrel No. **1.** On the fifth curve relating to the gripper **24** and in the portion between 450° and 540°, two sinusoidal curves are seen which are placed in proper timed relation to the other curves. The first curve shows the opening of the gripper while the second curve shows the closing of the gripper on the bag reeled on mandrel No. **1.**

The last curve on FIG. **15** relates to the tamper **25.** The apparatus preferred for the achievement of the operation of the tamper is also seen on FIG. **14** where the numeral **61** generally designates the tamper guide and the numeral **62** designates the tamper actuator, i.e., the mechanism which controls the reciprocation of the tamper in accordance with the timed program depicted on FIG. **15.** In FIG. **15,** it will be seen that the tamper goes through two complete reciprocations for each cycle. In the illustration given, the times contemplated by the graphs in FIG. **15** which are generally to scale, are of the order of 0.8 seconds for a complete cycle of 720°.

In the operation of the device and with respect to FIGS. **2–9,** the side view of FIG. **2** shows the vacuum belt of the conveyor **20** and the lower pulley **63** associated therewith and with the mandrel pivot arm **28** and its pivot point **29** (actually the axis of the cross shaft **29**). This is seen to the left. The mandrel **21** has completed the winding of the bag B and the mandrel **27** has just picked up the bag B′. The front view in FIG. **3** shows the picker **23** gripping the bag via the gripper **24** with the tamper **25** in a raised position. During this period of operation, the vacuum is on for the mandrel **27** and the air pressure is on for the mandrel **21.** The wiper **22** is engaging the top of bag B on mandrel **21** and holding the tail of this bag in place on the mandrel. The bag carton **26** is shown below the tamper in FIG. **3.**

In FIG. **4,** the showing is slightly later in the cycle from that of FIG. **2** — the bag having been removed from the mandrel **21** and the bag B′ being partially wound on the mandrel **27.** The mandrel pivot arm **28** is in the process of being pivoted upward to put the mandrel **27** in position to pick up a subsequent bag B′ from the vacuum belt conveyor **20.** The front view as seen in FIG. **5** shows the picker **23** moved all the way to the right and having released the bag B previously wound on the mandrel **21** against a set of stripper bars **64.** FIG. **5** also shows the tamper in two positions. The solid line position shown is just after the bag B has been released by the gripper **24** of the picker **23.** The dotted line position of the tamper **25** is as it approaches the bottom end of its stroke. During this period of operation there is no vacuum or air pressure on the mandrel **21,** but there is vacuum on the mandrel **27.** The wiper **22** is seen to be in a retracted position **22′** so as to ptrmit the indexing or oscillation of the mandrel **21.** For this purpose the wiper **22** is mounted on a retractable bracket **65** (see FIG. **1**) which is operably associated with the indexing device **38.**

In FIG. **6** the side view is generally the same as in FIG. **2** except that the mandrels are in the reverse position. In the front view FIG. **7,** the picker **23** is shown before the bag B′ is gripped instead of just after gripping as is the case in FIG. **3.**

In FIG. **8,** the side view is generally the same as FIG. **4** except the positions of the mandrels are reversed and the same applied to the showing in FIG. **4** as contrasted to that of FIG. **5.**

I claim:

1. A method of packaging flexible plastic bags comprising the steps of sequentially advancing bags along a predetermined path, reeling each bag upon itself about a mandrel disposed generally tangent to said path, gripping an edge portion of the reeled bag and moving the same transverse to said path to clear said path and thereafter releasing the grip thereon, and tamping said reeled bag into a case by movement parallel to said path, said mandrel having air passages confronting the leading edge portion of the bag and which portion develops the inner convolution of said reeled bag, and which further includes reducing the air pressure in said passages below atmospheric at the beginning of said reeling and thereafter just prior to said transverse moving increasing the air pressure in said passages to above atmospheric.

2. A method of packaging flexible plastic bags comprising the steps of sequentially advancing bags along a predetermined path, reeling each bag upon itself about a mandrel disposed generally tangent to said path, rotating said mandrel at a surface speed at the beginning of said reeling lower than the speed of the bag in said path to provide a loose wrap on the mandrel and thereafter before reeling is complete increasing the surface speed of the mandrel to greater than that of the bag in said path, gripping an edge portion of the reeled bag and moving the same transverse to said path to clear said path and thereafter releasing the grip thereon, and tamping said reeled bag into a case by movement parallel to said path.

3. The method of claim 2 in which the increase of mandrel surface speed occurs after approximately one convolution of the bag to be reeled has been achieved.

4. The method of claim 2 in which the increased mandrel surface speed is maintained substantially throughout the remainder of the reeling of the bag.

5. A method of packaging flexible plastic bags comprising the steps of sequentially advancing bags along a predetermined path, reeling each bag upon itself about a mandrel disposed generally tangent to said path, said reeling being achieved on a pair of mandrels and which further includes simultaneously oscillating said mandrels over an arcuate path to serially position one mandrel approximately tangent to said predetermined path and the other mandrel spaced from said predetermined path and in position for reeled bag transverse movement, gripping an edge portion of the reeled bag and moving the same transverse to said path to clear said path and thereafter releasing the grip thereon, and tamping said reeled bag into a case by movement parallel to said path, a given bag being reeled while a preceding reeled bag is being moved transversely and being tamped.

6. The method of claim 5 in which said gripping occurs when each mandrel is at the end of said arcuate path corresponding to said position for reeled bag transverse movement, said gripping occuring at about the commencement of the reeling of the succeeding bag on the mandrel in said approximately tangent position.

7. The method of claim 6 in which the mandrel in said approximately tangent position is being rotationally accelerated during the gripping of the reeled bag on the mandrel in the position for reeled bag transverse movement.

8. The method of claim 6 in which said reeled bag transverse movement is completed at about the completion of reeling of a succeeding bag and in which said tamping occurs during arcuate path movement of a mandrel into approximate tangency to said predetermined path.

9. A method for the rapid packaging of refuse bags comprising advancing bags sequentially along a predetermined path while simultaneously indexing a pair of spaced apart mandrels into and out of approximate tangency to said path whereby when one mandrel is approximately tangent the other mandrel is spaced from said path, temporarily stopping said indexing to cause said mandrels to dwell in respective positions and during said dwell reeling a bag on the approximately tangent mandrel while stripping a previously reeled bag from the other mandrel in the direction transverse to said predetermined path and generally flattening said stripped bag into a case by movement in a direction parallel to but spaced from said path and during the indexing of said mandrels.

10. The method of claim 9 in which the reeling is achieved by a surface speed of said mandrels greater than the speed of advance of said bags in said path to provide a gap between the trailing edge of one bag and the leading edge of the succeeding bag.

11. The method of claim 9 in which said mandrels are equipped with air passages selectively communicated with air pressure and vacuum and wherein vacuum is applied to said mandrel during reeling and air pressure is applied during stripping.

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