Feb. 18, 1958 V. A. LEHMKUHLE ET AL 2,823,505

AUTOMATIC BAG SELECTOR AND OPENER

Filed April 11, 1955 2 Sheets-Sheet 1

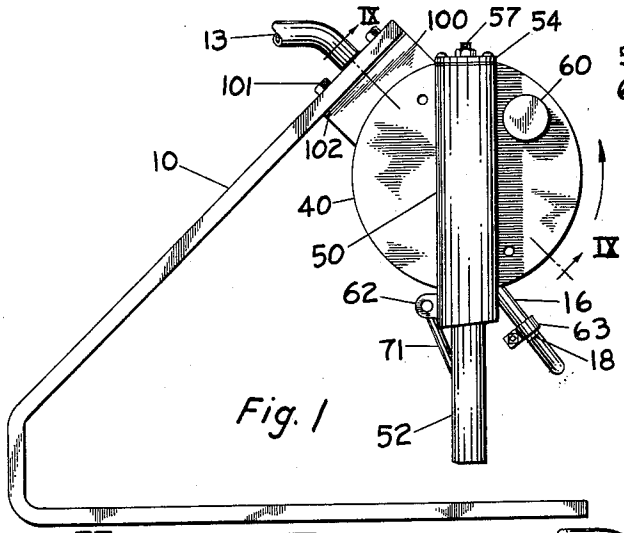


Fig. 1

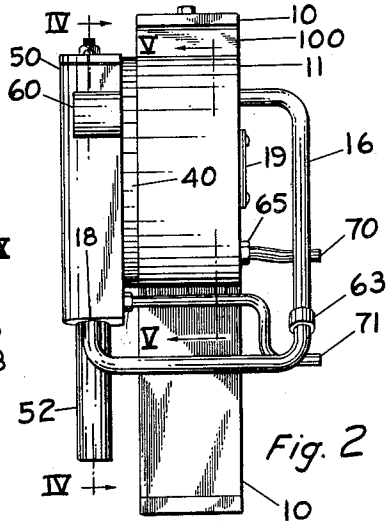


Fig. 2

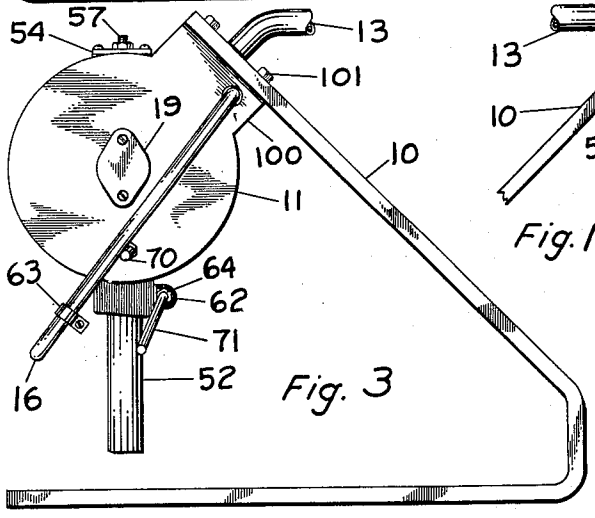


Fig. 3

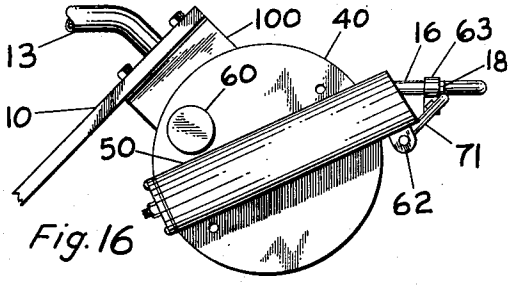


Fig. 16

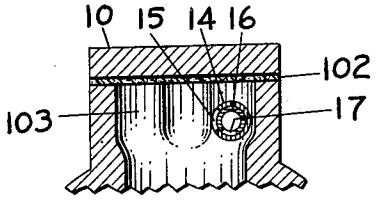


Fig. 11

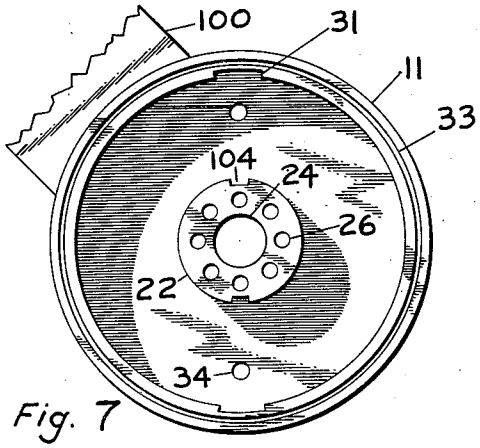


Fig. 7

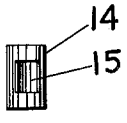


Fig. 13

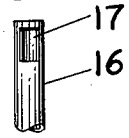


Fig. 14

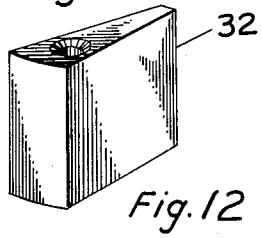


Fig. 12

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AUTOMATIC BAG SELECTOR AND OPENER

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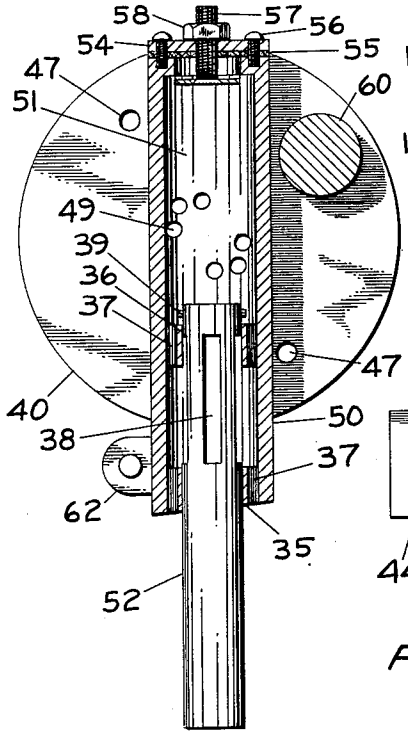


Fig. 4

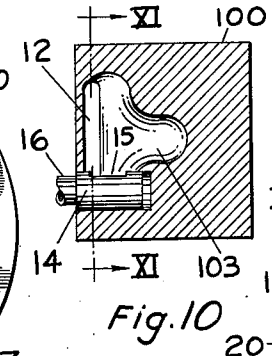


Fig. 10

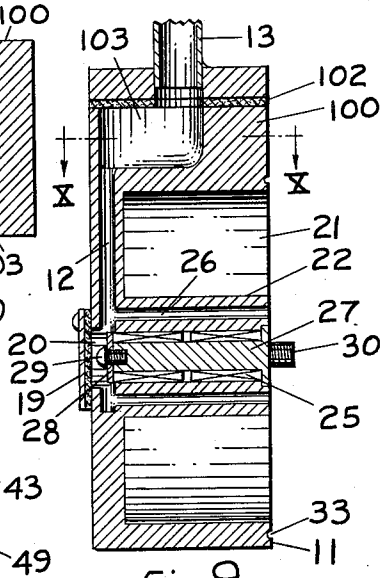


Fig. 9

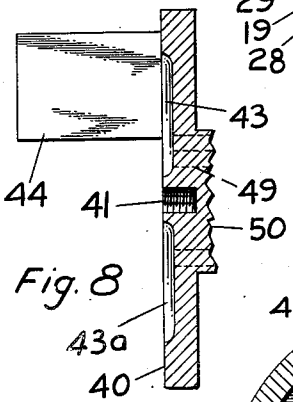


Fig. 8

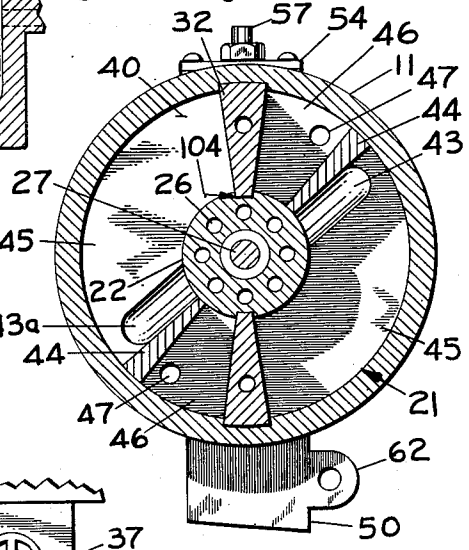


Fig. 5

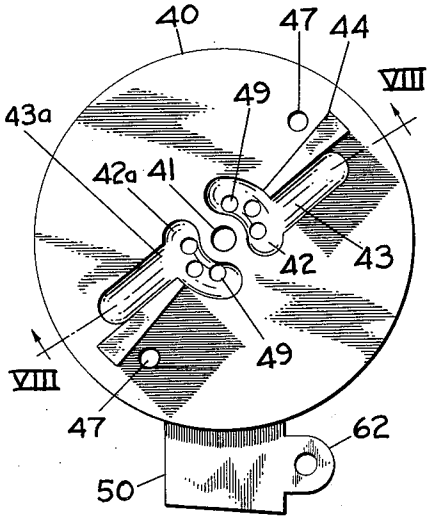


Fig. 6

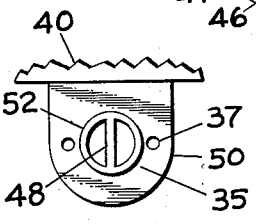


Fig. 15

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AUTOMATIC BAG SELECTOR AND OPENER

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Application April 11, 1955, Serial No. 500,464

9 Claims. (Cl. 53—386)

This invention relates to a vacuum operated, automatic machine for selecting and opening collapsed bags from a stack, one at a time.

While various types of mechanisms have been known and used having the purpose of selecting bags one at a time from a bulk quantity of bags, this invention provides a machine which is an appreciable improvement both structurally and functionally over heretofore existing equipment.

This invention provides a fully automatic machine of simple design. The operator does not have to perform any operation other than to remove the bag in order to trigger the machine's cycle of operation. The machine is greatly simplified by the complete elimination of valves. This reduces the cost of the equipment and decreases the likelihood of operational failure.

This invention provides a machine not only capable of selecting bags, one at a time, but of positively opening each bag. This latter operation is as important as the selection of the individual bags because of the difficulty so frequently experienced in manually opening bags which have been tightly pressed together.

Having selected, lifted and opened a bag, it will hold it in a convenient position for the operator to grasp. It will continue to do this until the operator is ready to remove the bag. The machine requires only a small amount of vacuum and, therefore, does not require large air pump facilities for efficient operation.

With these objects and advantages in mind, the construction and operation of this invention will be readily understood by those acquainted with equipment of this type upon reading the following specification and the accompanying drawings.

In the drawings:

Fig. 1 is a front elevation view of our invention.

Fig. 2 is an end elevation view of our invention.

Fig. 3 is a rear elevation view of our invention.

Fig. 4 is a sectional elevation view taken along the plane IV—IV of Fig. 2.

Fig. 5 is a sectional elevation view taken along the plane V—V of Fig. 2.

Fig. 6 is a rear view of the inside surface of the rotatable front cover.

Fig. 7 is a front view of the rear housing for our invention.

Fig. 8 is a sectional elevation view taken along the plane VIII—VIII of Fig. 1.

Fig. 9 is a sectional elevation view taken along the plane IX—IX of Fig. 1.

Fig. 10 is a sectional view taken along the plane X—X of Fig. 9.

Fig. 11 is a sectional view taken along the plane XI—XI of Fig. 10.

Fig. 12 is an oblique view of a stator vane for our invention.

Fig. 13 is a view of the mounting bushing for the tubular arm.

Fig. 14 is a fragmentary view of the end of the opener arm received into the bushing shown in Fig. 13.

Fig. 15 is a fragmentary bottom view of the bag lifting tube and its related housing.

Fig. 16 is a fragmentary front view of our invention in advanced or raised position.

In executing the objects and purposes of this invention, we have provided a machine having a cup-shaped, stationary housing. Within this housing is a stator having a pair of diametrically positioned vanes. Vacuum is introduced to the housing and passes through the center of the stator. Enclosing the front end of the housing is a rotatable cover having a pair of fixed vanes extending into the interior of the cup portion of the rear housing and designed to co-operate with the vanes of the stator. Means are provided for introducing the vacuum to the chambers created by the co-operation of the vanes on the stator and on the rotatable cover. Also provided is a tubular plunger designed to grip the bags by suction. The weight of the plunger is such that when the bag has been gripped, the suction will lift both the plunger and the bag.

A secondary opening is provided about the plunger, which opening is connected to the vacuum source operating the machine. When the plunger is fully withdrawn within the housing, the bag closes the secondary opening, thereby causing the vacuum to operate on the vanes. This initiates rotation of the cover. As the cover is rotated, the bag is carried past the bag opening arm. This arm, by means of a lever, is then caused to move with the rotatable cover. The initial pivotal movement of the opening arm introduces the vacuum to the interior of the arm and by means of an opening adjacent the bag, the bag is pulled open. The pivotal point of the arm and the center of rotation of the cover are offset, causing the arm to recede from the cover. This separation of the arm and cover pulls the bag open. A stop is provided when the bag has been raised and opened to the desired position.

Having reached this stop, the machine will remain stationary until the bag is removed. Removal of the bag permits air to be reintroduced into the interior of the machine, reducing the vacuum. The machine thereupon will return to its normal position to select another bag.

Referring specifically to the drawings, the numeral **10** indicates a generally U-shaped standard (Figs. 1, 2 and 3). Mounted to and depending from the top of the standard is a generally cup-shaped housing **11**. Extending from the upper portion of the housing is a boss **100** which is mounted snugly against the standard **10** by bolts **101**. An air tight seal is assured by the use of the gasket **102**. Within the boss **100** is a vacuum chamber **103** communicating with the vacuum conduit **13** (Figs. 9, 10 and 11). The vacuum chamber **103** communicates with a channel **12** extending to the center of the housing (Figs. 9 and 10). The conduit **13** is connected to a suitable source of vacuum such as the intake port of an air pump.

The vacuum chamber **103** is traversed by a bushing **14** (Figs. 10 and 11). The bushing **14** is substantially smaller than the vacuum chamber **103**, thereby creating an air passageway about the bushing. This permits the vacuum to be created in the channel **12**. The bushing has an aperture **15** on one side. The bushing provides a support and pivotal mount for the tubular, swinging arm **16**. The end of the tubular arm inserted into the bushing **14** is closed except for a side port **17**. When the arm is in its inoperative or down position (Fig. 11), the side port **17** is misaligned with the aperture **15** in the bushing **14**. The aperture **15** and the side port **17**

are so positioned, however, that only a short arc of pivotal movement in an upward direction is required to align them.

The tubular arm **16** is generally U-shaped and extends down, around and under the housing **11**. Its lower end extends beyond the front face of the housing and is turned upwardly toward the hereinafter described plunger. The end **18** is open. The purpose of this construction will be described more fully under "Operation."

The vacuum conduit **12** terminates in a concentric, axially extending opening **20** through the rear wall of the housing **11** (Fig. 9). The opening **20** is closed by a detachable gasket cap **19**. The intake conduit **13**, the vacuum chamber **103** and the vacuum conduit **12**, collectively, constitute a single conduit by which air is exhausted from the interior of the machine.

The housing **11** has a central chamber **21**. Integral with the housing **11** and concentric with the central chamber **21** is an annular stator hub **22**. The length of the stator hub **22** is equal to the depth of the central chamber. The stator hub **22** has a pair of diametrically spaced slots **104** adapted to receive the stator vanes **32** (Fig. 5). The hub has a plurality of air holes **26** passing therethrough. The air holes **26** communicate with the opening **20**.

A central opening **24** extends through the stator **22** (Fig. 7). Press-fitted into the opening **24** are a pair of tandemly arranged bearings **25** (Fig. 9). Press-fitted through the bearings **25** is a shaft **27** flanged at its forward end. The flange seats in a suitable pocket in the front end of the hub **22**. The forward end of the shaft **27** has an externally threaded stud **30**. The rear end of the opening **24** is closed by a plate **28** secured to the shaft **27** by a screw **29**. This construction makes the shaft **27** freely rotatable within the hub **22**. It will be recognized that various types of bearings may be used for the bearings **25** such as needle or roller bearings.

The interior surface of the outer wall of the housing **11** has a pair of diametrically spaced slots **31** aligned with the slots **104** of the hub **22** (Fig. 7). The slots **31** receive the opposite ends of the stator vanes **32**. The front face of the housing also has a groove **33** designed to co-operate with the cover **40** for preventing air leak between the housing and the cover.

The stator vanes **32** are wedge-shaped (Fig. 12) and each has an opening for a screw for securing them to the housing **11**. The vane attaching screws engage the threaded openings **34** in the housing **11** (Fig. 7).

The open forward end of the housing **11** is closed by a rotatable cover **40**. The cover **40** has a central, threaded opening **41** (Fig. 6) designed to receive the threaded stud **30** (Fig. 9). Adjacent the opening **41** are a pair of arcuate passageways **42** and **42***a*, radially spaced from the center of the cover to align with the air passageways **26** extending through the hub **22**. Because of the multiplicity of the air passageways **26**, one or more of them will always be aligned with each of the arcuate passageways **42** and **42***a*, irrespective of the length of the arc of rotation of the cover **40**. Extending from the upper arcuate passageway **42** is a conduit **43** opening through the interior face of the cover **40**. Extending from the lower arcuate passageway **42***a* is a second conduit **43***a* opening through the interior face of the cover. The openings for the passageways **43** and **43***a* are generally diametrically positioned with respect to each other.

Adjacent each of the passageways **43** and **43***a* is a rearwardly extending vane **44** (Figs. 6 and 8). The vanes **44** are integral with the cover and are designed to seat within the interior chamber **21** of the housing and to approach the side walls of the interior chamber **21** as closely as possible without binding. The radial, inner ends of the vanes **44** are designed to just clear the hub **22**. These clearances with the hub and with the walls of the housing are such as to prevent any substantial leakage of air at either of these points but great enough to eliminate possible binding between the parts.

The vanes **44**, together with the vanes **32**, form four chambers within the housing (Fig. 5). These chambers constitute the vacuum chambers **45** and the pressure chambers **46** (Fig. 5). The conduits **43** and **43***a* open into the vacuum chambers **45**. The pressure chambers **46** are each individually vented to the atmosphere through the cover **40** by means of the holes **47**. The purpose of this arrangement will appear more fully hereinafter.

Extending forwardly from the front or exterior face of the cover **40** is a hollow casing **50**. The vertical center line of the hollow casing is centered about a diameter of the cover **40**. The lower portion of the casing **50** extends substantially below the cover **40**. The interior opening **51** within the hollow casing **50** is circular and receives the tubular piston or plunger **52** (Fig. 4).

Projecting into the interior opening **51** of the casing **50** are a pair of spaced, annular baffles **35** and **36** (Fig. 4). The lower baffle **35** is at the lower end of the casing **50**. The upper baffle **36** is spaced substantially above the lower one. The central openings in the baffles **35** and **36** slidably receive the tubular plunger **52**. Both of the baffles have a pair of small orifice or air passages **37** through them (Fig. 15). The orifices **37** provide the secondary air passages which bypass the plunger.

The plunger **52**, adjacent its upper end, has side slots **38**. It also has stop pins **39** designed to limit downward or extending travel of the plunger. The lower end of the plunger has a cross bar **48** designed to prevent the bags being drawn into the end of the plunger (Fig. 15).

A plurality of openings **49** through the cover **40** providing communication between the opening **51** in the casing **50** and the arcuate passageways **42** and **42***a* (Figs. 4 and 6). Thus, air may be exhausted from the interior of the casing **50**. Since the tubular plunger **52** is open at both ends, air may be drawn into the interior opening **51** of the casing **50** through the plunger.

The upper end of the casing **50** is closed by a cover **54** and gasket **55**. The cover **54** is detachably secured by screws **56**. Extending through the cover **54** is a vertically adjustable stop **57** for the plunger **52**. The stop is locked by means of the nut **58**.

Mounted on the exterior of the cover **40** is a counterweight **60**. The counterweight functions to balance the cover whereby it may be freely rotated by the vacuum without the necessity of overcoming the resistance which would be created by eccentric loading of the cover.

Extending from the lower end of the rearward face of the housing **11** is a rod **70** (Figs. 2 and 3). The rod **70** serves as a stop against the downward movement of the tubular arm **16**. Projecting rearwardly from a boss **62** on the tubular casing **50** is a second rod **71**. The second rod **71** is offset and its length is such that it passes beyond the rearward extremity of the tubular arm **16**. As the cover **40** is rotated, the arm **71** is carried with it.

After a predetermined arc of travel, the rod **71** contacts the swinging arm **16** and thereafter carries the swing arm **16** up with it. A stop collar **63** is provided on the swinging arm **16**. Contact between the stop collar **63** and the rod **71** limits the upward rotation of the cover **40** (Fig. 16). The stop collar **63** is adjustable along the swinging arm **16**.

The length of the arc of movement of the cover **40** before movement of the swinging arm is initiated may be adjusted by rotating the rod **71** after loosening the nut **64**.

The rod **70** is also offset so that by rotation the downward limit of travel of the swinging arm **16** may be adjusted. Adjustment may be made upon loosening the nut **65** (Fig. 2).

Operation

The machine, as it appears in Fig. 1, is in its "at rest" or inoperative position. A stack of bags are placed beneath the plunger **52**. Normally, the bags are placed in

a box or other container so the plunger, when it drops to its bottom position, may reach to the bottom of the stack of bags. In order to slip the bags under the plunger, the plunger is raised by telescoping it into the casing **50**. This is easily done since the plunger may reciprocate freely within the channel.

After the bags have been placed with the open end of the bag extending to the right, as the machine appears in Fig. 1, and the open end of the bag closely adjacent the plunger **52**, the plunger is dropped on the bags. A vacuum is then created in the machine through the conduit **13** by any suitable means such as an air pump. With the machine in this position, the apertures **15** and **17** at the upper end of the swinging arm **16** are misaligned as they appear in Fig. 11. Thus, air will not be drawn into the vacuum chamber **103** through the tubular arm **16**. As a result, air is exhausted from the central opening **20** and thus through the center of the hub **22** (Fig. 9). Some air will be withdrawn from the vacuum chambers **45** but this will not be enough to cause the rotatable cover **40** to move since a sufficient supply of air will pass into the interior of the machine through the orifices **37** in the baffles **35** and **36** of the casing **50** (Fig. 4). Air entering through the orifices **37** passes through the openings **49** and the arcuate passageways **42** and **42***a*.

At the same time, air will be withdrawn from the interior opening **51** of the casing **50** through the openings **49**. This will immediately draw the bag tightly against the open, lower end of the plunger **52**, shutting off this supply of air. As a result of this, the plunger **52** will be lifted due to the upwardly directed vector of force resulting from the lowering of pressure within the plunger and the atmospheric pressure bearing against that portion of the bag covering the lower end of the plunger **52**. The plunger **52** will rise, separating the bag from the pile.

The plunger will continue to rise until it is entirely withdrawn into the casing **50**. At this point, the bag will seat across the orifices **37** in the lower baffle **35**, closing them. With the supply of air to the interior of the machine through both the plunger **52** and the orifices **37** shut off, a vacuum will rapidly be created within the vacuum chambers **45** by the air being exhausted through the conduits **43** and **43***a*. Since the pressure chambers **46** are both open to the atmosphere through the ports **47**, a pressure differential will result between the opposite surfaces of the vanes **44**. This will force the vanes **44** away from the ports **47**. Since the vanes **44** are affixed to the cover **40**, the cover and its related structure will be rotated.

In the initial portion of its rotation, the bag will be carried between the casing **50** and the forward, lower end of the tubular arm **16**. When the end of the bag, designed to be opened, has just passed the open end **18** of the arm **16**, contact between the rod **71** and the swinging arm **16** will initiate movement of the arm **16** along with the rotatable head **40**. Shortly thereafter, the apertures **15** and **17** (Fig. 11) will become aligned and air will be exhausted from the tubular arm **16**. One side of the bag will then be drawn tightly against the open end **18** of the arm, pulling the sides of the bag apart.

The head **40** will continue to rotate upwardly in the direction of the arrow in Fig. 1 until its upward progress is prevented by contact between the rod **71** and the stop collar **63** (Fig. 16). During this upward movement, the lower end of the tubular arm **16** will separate from the casing **50**, pulling the sides of the bag further apart. The amount the bag is opened by the upward movement of the machine will be determined by the length of the arc of rotation of the rotatable cover **40**, since the greater the rotation the greater will be the separation between the arm **16** and the casing **50** due to the eccentricity of their centers of rotation.

The machine, having reached the upper limit of its travel, will remain stationary, holding the bag in position by reason of the vacuum resulting from the bag preventing the entrance of air into the machine. The machine will continue to hold the bag as long as desired by the operator. When the operator is ready for the bag, he removes it merely by pulling it away from the vacuum.

As soon as this happens, air will once more enter in substantial quantities through the casing **50**. The slight eccentricity in weighting of the cover **40** will cause it to return to its normal position. As it does so, the plunger **52** will extend from the casing **50**. At the same time, the arm **16** will drop back to its initial position as rapidly as the stop rod **71** permits. Thus, the plunger **52** will, by gravity, drop upon the top bag of the pile beneath. As soon as this happens, the supply of air through the plunger **52** is blocked and the cycle of selecting, lifting and opening another bag will be repeated.

The stop rod **70** prevents the arm **16** from swinging too far in its return movement. By preventing the arm **16** from swinging all the way back with the rod **71**, a certain amount of upward movement of the cover **40** and casing **50** is permitted before movement of the arm is initiated. This is important since it permits the bag to be placed over the open end **18** of the arm before the arm starts to move and before the vacuum is applied. If the vacuum is applied to the arm **16** before the bag is in position, the edge of the bag will be drawn into the open end **18** and only a partial blockade of the air entering this opening will be created.

The structure of this machine eliminates all conventional valves. The only control of the movement of air through the machine is effected either by the relative alignment of the apertures **15** and **17** (Fig. 11) or by the bag itself as it closes the three different air inlets, that being the end of the plunger **52**, the orifices **37** and the open end **18** of the arm **16**.

The machine is operated by a careful balance between the volume of air being exhausted through the conduit **13** and the volume of air being admitted from all sources. The volume of air being admitted when the plunger **52** and orifices **37** are both open is so great that no effective pressure differential occurs within the machine. When, however, the end of the plunger is closed, this balance is disturbed, resulting in the retraction of the plunger due to an increase in pressure differential throughout the machine. The volume of air admitted by the orifices **37** is such that this differential will lift the plunger but will be insufficient to rotate the cover **40**.

When, however, the orifices **37** are closed, the differential within the machine increases substantially. This increase overcomes the balance of forces keeping the cover in equilibrium. The cover then starts to rotate. The volume of air momentarily admitted by the open end **18** of the arm **16** is not only not great enough to destroy the pressure differential rotating the cover **40** but its duration is so short that, at most, it might cause slight hesitation in the cover's rotation.

The retraction of the plunger **52** into the casing **50** also reduces the forces acting against rotation of the cover **40**. Thus, when the orifices **37** are finally closed, the force required to upset the equilibrium of the cover is substantially less than that which is necessary when the plunger is extended.

The elimination of conventional valve structure simplifies the machine and greatly reduces the possibility of operational failure. It also reduces the initial cost of the machine because such valves are normally expensive components.

The construction of the machine makes it wholly unnecessary for the operator to trip any valves or do anything to the machine to cause it to repeat its cycle of operation. Thus, it is easier to train an operator in its proper operation and requires less of the operator's time. This materially speeds up the whole operation.

While we have described a preferred embodiment of this invention, it will be recognized that various modifications may be made. Each of these modifications is to

be considered as included in the hereinafter appended claims unless these claims expressly state otherwise.

We claim:

1. In a bag selecting machine, the combination comprising: a hollow housing having a stationary member and a rotatable member; said rotatable member being biased toward bag receiving position; a stationary vane within said housing; a rotatable vane within said housing adapted to cooperate with said stationary vane to form a vacuum chamber and a pressure chamber; said rotatable vane being fixedly secured to said rotatable member; a tubular casing on said rotatable member; a tubular plunger slidably received in said casing; an air passage in said casing adjacent said plunger; conduit means for simultaneously exhausting air from said vacuum chamber of said housing, together with air entering through said plunger and through said air passage; the size of said air passage being such that when the end of said plunger is closed sufficient pressure differential will be created in said casing to raise said plunger but insufficient to rotate said rotatable vane; said rotatable vane being adapted to move said rotatable member away from said bag receiving position when both the end of said plunger and of said air passage are closed.

2. In a bag selecting machine, the combination comprising: a hollow housing having a stationary member and a rotatable member; said rotatable member being biased toward bag receiving position; stationary vanes within said housing; rotatable vanes within said housing adapted to cooperate with said stationary vanes to form vacuum chambers and pressure chambers; said rotatable vanes being fixedly secured to said rotatable member; a hollow casing on said rotatable member; a tubular plunger slidably received in said casing; an air passage in said casing adjacent said plunger; conduit means for simultaneously exhausting air from the vacuum chambers of said housing, together with air entering through said plunger and through said air passage; the size of said air passage being such that when the end of said plunger is closed sufficient pressure differential will be created in said casing to raise said plunger but insufficient to rotate said rotatable vanes; said rotatable vanes being adapted to move said rotatable member away from said bag receiving position when both the end of said plunger and of said air passage are closed.

3. In a bag selecting machine, the combination comprising: a hollow housing having a stationary member and a rotatable member; said rotatable member being biased toward bag receiving position; a tubular casing on said rotatable member; a tubular plunger slidably received in said casing; an air passage in said casing adjacent said plunger; conduit means for simultaneously exhausting air from the interior of said housing, together with air entering through said plunger and through said air passage; air pressure differential operated means within said housing affixed to said rotatable member, said means being adapted to rotate said cover when the air pressure differential within said housing exceeds a predetermined amount; the size of said air passage being such that when the end of said plunger is closed sufficient pressure differential will be created in said casing to raise said plunger but insufficient to operate said means; said means being adapted to move said rotatable member away from said bag receiving position when both the end of said plunger and of said air passage are closed.

4. In a bag selecting machine, the combination comprising: a hollow housing having a stationary member and a rotatable member; said rotatable member being biased toward bag receiving position; stationary vanes within said housing; rotatable vanes within said housing adapted to cooperate with said stationary vanes to form vacuum chambers and pressure chambers; said rotatable vanes being fixedly secured to said rotatable member; a tubular casing on said rotatable member; a tubular plunger slidably received in said casing; an air passage in said casing adjacent said plunger; conduit means for simultaneously exhausting air from the vacuum chambers of said housing, together with air entering through said plunger and through said air passage; the size of said air passage being such that when the end of said plunger is closed sufficient pressure differential will be created in said casing to raise said plunger but insufficient to rotate said rotatable vanes; said rotatable vanes being adapted to move said rotatable member away from said bag receiving position when both the end of said plunger and of said air passage are closed; a tubular arm pivotally secured to said housing; one end of said arm being radially spaced from said casing as said rotatable member rotates; said arm having an air intake port aligned with the end of said plunger as said rotatable member rotates; a lost motion connection adapted to move said arm with said rotatable member after said plunger and said intake port have become axially aligned; a normally closed air exhaust port in the other end of said arm, said port being movable into communication with said conduit means after said plunger and air intake port are aligned.

5. In a bag selecting machine, the combination comprising: a hollow housing having a stationary member and a rotatable member; said rotatable member being biased toward bag receiving position; stationary vanes within said housing; rotatable vanes within said housing and cooperating with said stationary vanes to form vacuum chambers and pressure chambers; said rotatable vanes being fixedly secured to said rotatable member; a tubular casing on said rotatable member; a tubular plunger slidably received in said casing; an air passage in said casing adjacent said plunger; conduit means for simultaneously exhausting air from the vacuum chambers of said housing, together with air entering through said plunger and through said air passage; the size of said air passage being such that when the end of said plunger is closed sufficient pressure differential will be created in said casing to raise said plunger but insufficient to rotate said rotatable vanes; said rotatable vanes being adapted to move said rotatable member away from said bag receiving position when both the end of said plunger and of said air passage are closed; a tubular arm pivotally secured to said housing; one end of said arm being radially spaced from said casing as said rotatable member rotates; said arm having an air intake port aligned with the end of said plunger as said rotatable member rotates; a lost motion connection adapted to move said arm with said rotatable member after said plunger and said intake port have become axially aligned; a normally closed air exhaust port in the other end of said arm, said port being movable into communication with said conduit means after said plunger and air intake port are aligned; said point of pivotal mounting of said swinging arm being remote and spaced further from the end of said plunger than said axis of rotation of said rotatable member whereby said arm and casing diverge as said rotatable member swings upwardly.

6. In a bag selecting machine, the combination comprising: a hollow housing having a stationary member and a rotatable member; said rotatable member being biased toward bag receiving position; a stationary vane within said housing; a rotatable vane within said housing adapted to cooperate with said stationary vane to form a vacuum chamber and a pressure chamber; said rotatable vane being fixedly secured to said rotatable member; a tubular casing on said rotatable member; a tubular plunger slidably received in said casing; an air passage in said casing adjacent said plunger; conduit means for simultaneously exhausting air from the vacuum chamber of said housing, together with air entering through said plunger and through said air passage; the size of said air passage being such that the end of said plunger is closed sufficient pressure differential will be created in said casing to raise said plunger but insufficient to rotate said rotatable vane; said rotatable vane being adapted to move

said rotatable member away from said bag receiving position when both the end of said plunger and of said air passage are closed; a tubular arm pivotally secured to said housing; one end of said arm being radially spaced from said casing as said rotatable member rotates; said arm having an air intake port aligned with the end of said plunger as said rotatable member rotates; a lost motion connected adapted to move said arm with said rotatable member after said plunger and said intake port have become axially aligned; a normally closed air exhaust port in the other end of said arm, said port being movable into communication with said conduit means after said plunger and air intake port are aligned.

7. In a bag selecting machine, the combination comprising: a hollow housing having a stationary member and a rotatable member; said rotatable member being biased toward bag receiving position; a tubular casing on said rotatable member; a tubular plunger slidably received in said casing; an air passage in said casing adjacent said plunger; conduit means for simultaneously exhausting air from the interior of said housing, together with air entering through said plunger and through said air passage; air pressure differential operated means within said housing affixed to said rotatable member, said means being adapted to rotate said cover when the air pressure differential within said housing exceeds a predetermined amount; the size of said air passage being such that when the end of said plunger is closed sufficient pressure differential will be created in said casing to raise said plunger but insufficient to operate said means; said means being adapted to move said rotatable member away from said bag receiving position when both the end of said plunger and of said air passage are closed; a tubular arm pivotally secured to said housing; one end of said arm being radially spaced from said casing as said rotatable member rotates; said arm having an air intake port aligned with the end of said plunger as said rotatable member rotates; a lost motion connection adapted to move said arm with said rotatable member after said plunger and said intake port have become axially aligned; a normally closed air exhaust port in the other end of said arm, said port being movable into communication with said conduit means after said plunger and air intake port are aligned.

8. In a bag selecting machine adapted to be used with a source of vacuum, the combination comprising: a housing having a stationary member and a movable member; said movable member being biased to bag receiving position; a tubular casing on said movable member; a tubular plunger slidably received in said casing; an air passage in said casing adjacent said plunger; a vacuum operated motor for moving said movable member away from said bag receiving position when sufficient vacuum is applied to it; conduit means for simultaneously exhausting air from said motor together with air entering through said plunger and said air passage; the size of said air passage being such that when the end of said plunger is closed, sufficient pressure differential will be created in said casing to raise said plunger but insufficient to move said motor; said motor being adapted to move said movable member away from said bag receiving position when the ends of both said plunger and said air passage are closed.

9. In a bag selecting machine adapted to be used with a source of vacuum, the combination comprising: a housing having a stationary member and a movable member; said movable member being biased to bag receiving position; a tubular casing on said movable member; a tubular plunger slidably received in said casing; an air passage in said casing adjacent said plunger; a vacuum operated motor for moving said movable member away from said bag receiving position when sufficient vacuum is applied to it; conduit means for simultaneously exhausting air from said motor together with air entering through said plunger and said air passage; the size of said air passage being such that when the end of said plunger is closed, sufficient pressure differential will be created in said casing to raise said plunger but insufficient to move said motor; said motor being adapted to move said movable member away from said bag receiving position when the ends of both said plunger and said air passage are closed; a tubular arm movably connected to said housing for travel with said movable member as said movable member moves away from said bag receiving position; said arm being adapted to recede radially from said movable member as said movable member moves away from said bag receiving position; said arm having an air intake port adapted to become aligned with the end of said plunger as said movable member moves; means to exhaust air from said tubular arm after said air intake port and plunger have become aligned.

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