Oct. 22, 1968 F. REXUS 3,406,727

PORTABLE CONTINUOUS ARTICLE BAGGING MACHINE

Filed Dec. 17, 1965 2 Sheets-Sheet 1

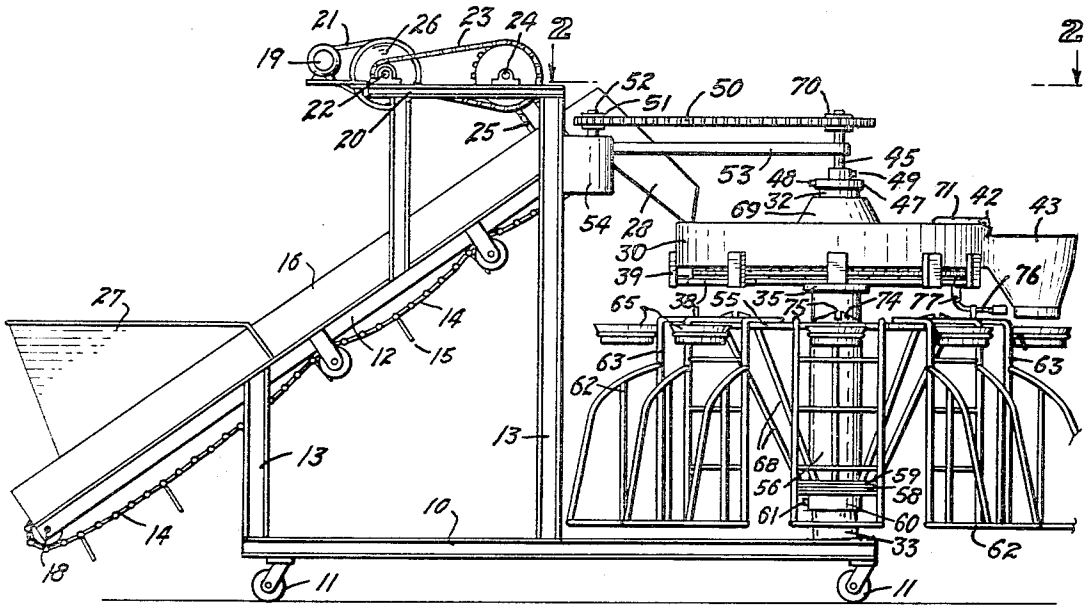


Fig. 1

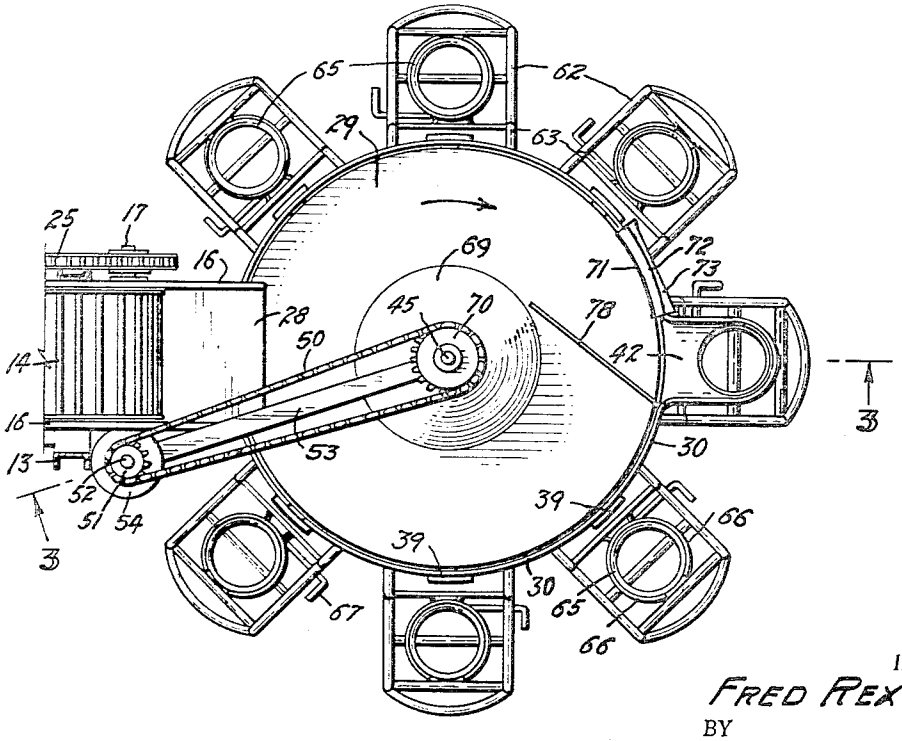


Fig. 2

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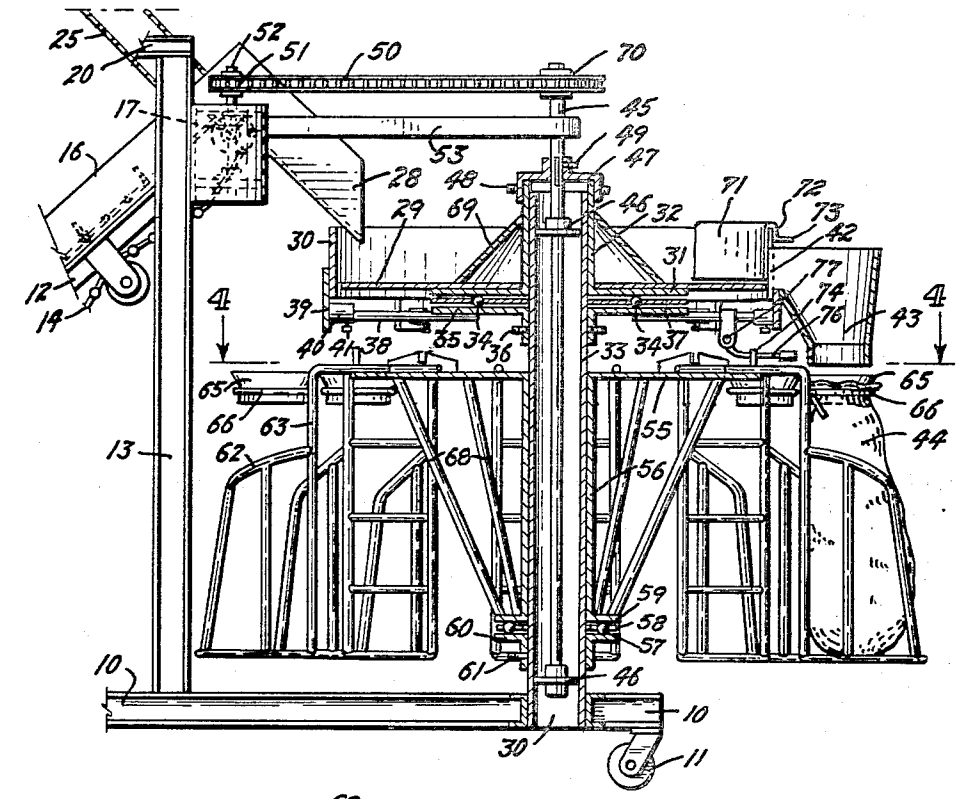


Fig_3

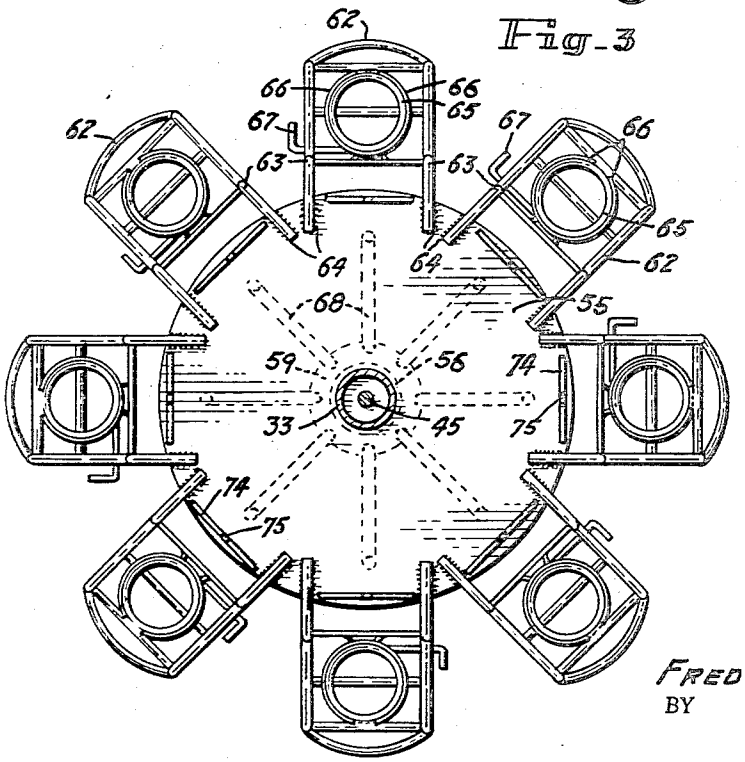


Fig_4

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PORTABLE CONTINUOUS ARTICLE BAGGING MACHINE

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ABSTRACT OF THE DISCLOSURE

A rotatable annular series of bag holders with bag filling means superimposed thereover, said filling means being circumferentially adjustable relative to said annular series so that the point of filling may be pre-positioned at any desired circumferential position, and having means for releasably latching each successive bag holder at the point of filling.

This invention relates to a machine for placing articles, such as potatoes, in bags and has for its principal object the provision of a rapid, highly effifficient machine which will supply a continuous flow of articles to a continuously rotating supply of open bags to successively fill the latter.

Another object of the invention is to so construct the machine to provide an annular series of bag holders which can be freely rotated to enable filled bags to be continuously removed and empty bags to be continuously placed in position to be filled without disturbing the incoming supply of articles.

Still another object is to provide such a machine in which the point of bag filling can be adjusted to any desired position around the annular series of bags so that the time intervals of filled bag removal and empty bag replacement can be adjusted to suit the user without interference with the operation of the machine.

A further object is to provide an intermixing pan with a rotating bottom for intimately intermixing and distributing the incoming articles to provide a uniform supply to the bags.

A still further object is to provide vertical adjustment means for the pan and the annular series of bag holders so that the machine can be quickly adjusted for use in bagging articles of various weights and sizes.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention, reference is made to the accompanying drawing which forms a part hereof. Like numerals refer to like parts in all views of the drawing and throughout the description.

In the drawing:

FIG. 1 is a right side, elevational view of the continuous article bagging machine of this invention;

FIG. 2 is an enlarged, fragmentary top plan view looking downwardly on the line 2—2, FIG. 1;

FIG. 3 is a similarly enlarged, vertical sectional view, taken on the line 3—3, FIG. 2; and

FIG. 4 is a horizontal section looking downwardly on the line 4—4, FIG. 3.

The machine can, of course, be used to bag any material or articles. It is, however, more particularly designed for the bagging of potatoes and will be so described in the following specification.

The machine is mounted upon a horizontal base frame 10 of suitable structural members which is portably mounted upon suitable castor wheels 11. An inclined conveyor frame 12 is supported from the base frame upon suitable posts 13.

A conventional, endless, bar-type conveyor chain 14, provided with carrying flights 15, is mounted in the conveyor frame 12, between side-boards 16 and is trained over suitable sprockets on an upper conveyor drive shaft 17 and a lower idler shaft 18. The upper drive shaft 17 is driven in any conventional manner from a motor 19 mounted on a motor frame 20 carried by the upper extremity of the conveyor frame 12. As illustrated, the motor transmits power through a belt 21 to a first jack shaft 22 which in turn transmits power at reduced speed, through a chain 23, to a second jack shaft 24 mounted on the motor frame 20. A drive chain 25 transmits power to a conventional chain sprocket 26 on the far extremity of the upper conveyor drive shaft 17 for causing the upper reach of the conveyor chain to travel upwardly.

The potatoes are fed to the conveyor from a load receiving hopper 27, mounted on the lower extremity of the conveyor frame 12, and the potatoes discharge from the conveyor into an inclined discharge chute 28 which delivers the elevated potatoes into a circular receiving pan.

The receiving pan comprises a circular, rotating pan bottom plate 29 surrounded by an upstanding, stationary, circular side wall 30. The pan bottom plate 29 rests upon a circular hub-disc 31 formed on the lower extremity of a hub sleeve 32 which rotatably surrounds the upper extremity of a vertical tubular post 33 which is fixedly mounted in and extends upwardly from the base frame 10 forwardly of the conveyor frame 12.

The hub-disc 31 and its hub-sleeve 32 are supported upon upper ball bearings 34 from a flanged bearing disc 35, the flange of which is adjustably mounted on the post 33 by means of suitable set screws 36. The ball bearings 34 are mounted in a circular, freely-rotatable ball separator plate 37.

The circular side wall 30 is supported in any desired manner from the flanged bearing disc 35 so as to be vertically adjustable with the pan bottom plate 29. As illustrated, the mounting comprises a plurality of spoke rods 38 welded beneath and extending radially outward in spaced relation from the bearing disc 35. The side wall is provided with downwardly-extending mounting plates 39 provided with inwardly-extending spoke sockets 40 into which the extremities of the spokes are locked by means of suitable set screws 41.

It can be seen that by loosening the set screws 36 the entire pan structure can be adjusted to any desired vertical position on the tubular post 33 and by loosening the set screws 41 the spacing between the periphery of the pan bottom plate 29 and the circular side wall 30 can be adjusted on the spoke rods 38. Also with the set screws 36 loosened the entire pan can be rotated circumferentially around the post 33 to any desired position.

The side wall 30 of the pan is provided with a gate opening from which a guide passage 42 extends. The guide passage terminates in a downwardly-extending discharge funnel 43 for directing potatoes into a bag 44 supported therebelow.

The pan bottom plate 29 is continuously rotated from a vertical center shaft 45 which is mounted in suitable bearings 46 in the tubular post 33 and which extends upwardly through a top cap member 47. The cap member 47 fits downwardly over the hub sleeve 32 and is fixedly attached to the hub sleeve by means of set screws 48 and to the center shaft 45 by means of a set screw 49.

The center shaft 45 is continuously rotated by means of a sprocket chain 50 extending from a drive sprocket 51, on a vertical drive shaft 52, to a driven sprocket 70, on the center shaft 45. The center shaft is maintained vertical by the bearings 46 in the post 33 but is braced against the tension of the chain 50 by a brace arm 53 extending from one of the conveyor frame posts 13. The vertical drive shaft may be driven from the upper conveyor drive shaft 17 in any desired manner. In actual practice it is

driven by a set of miter gears (not shown) contained in a gear box **54** mounted on the post **13**.

The bags are supported from a horizontal, circular bag plate **55** which is concentrically secured to the upper extremity of a cylindrical sleeve **56** which rotatably surrounds the tubular post **33** below the bearing disc **35**. The sleeve **56** is rotatably supported on the post upon suitable lower ball bearings **57** positioned in a separator plate **58** between a bottom flange **59** on the sleeve and a flanged bearing collar **60** fixed for vertical adjustment on the post by means of a suitable set screw **61**. The bag plate is rigidly maintained in a horizontal plane by means of angle braces **68** extending from the bearing collar **60**.

A plurality of equally-spaced bag frames **62** are carried about the periphery of the bag plate **55**. As illustrated, there are eight of the bag frames. They comprise an open enclosure having a back frame, two side frames, a bottom frame and an open front. The back frame of each bag frame includes two vertical side members **63** which extend upwardly and inwardly over the bag plate **55** and are welded thereto as indicated at **64** in FIG. 4. Each bag frame supports a circular bag collar **65** about which the throat of a bag **44** is secured by any suitable means to maintain the bag in an open position to receive potatoes from the discharge funnel **43**. As illustrated, two semicircular resilient clamping arms **66** can be swung into position about the throat of the bag to clamp it to the bag collar **65** through actuation of a clamping handle **67**.

A sliding gate **71** is provided for closing the passage **42** when desired. The gate **71** is preferably a metal plate curved to correspond to the circumference of the wall **30** and having a vertical width corresponding to the height of the wall. The upper edge is turned downwardly, as shown at **72**, to slidably engage the upper edge of the wall and outwardly to provide a hand grip **73**.

The bag frames **62** can be successively locked below the discharge funnel **43** by means of notched keeper plates **74** one of which is welded to the top of the bag plate **55** in radial alignment with each bag collar **65**. The opposite sides of the upper edge of each keeper plate **74** incline upward to a medially-positioned latch notch **75**. A suitable latch element is mounted on one of the spoke rods **38** to engage in each successive notch **75** to hold the bag plate **55** stationary while a bag is being filled. As illustrated, the latch element comprises a gravity-actuated latch lever **76** hinged at **77** to one of the spoke rods **38** so that it may drop into and engage in the notches **71**. The bag plate **55** can be released for free rotation by simply lifting the latch lever **76**.

A first operator is positioned at one side of the receiving pan to position empty bags in a bag holder. The latter operator secures a bag throat about a bag collar **65** and rotates the entire series of bag holders 45° to position the next successive bag below the discharge funnel **43**. A second operator at the other side of the receiving pan releases the throats of the filled bags and lifts them from the bag holders. Should it be found that more space be required for workers on either the empty bag side or the filled bag side of the pan, the set screw **36** may be loosened and the side wall may be rotated to position the discharge funnel and the latch lever **76** at any desired point for the convenience of the workers.

The centrifugal action of the rotating mass of potatoes spreads the latter uniformly outwardly against the circular side wall so that when they reach the guide passage **42**, they tend to flow therein and drop into the open bag therebelow. The spreading action is assisted by the use of a concentric cone element **69** positioned on the bottom plate and inclined radially outward to direct the potatoes toward the circumference. The flow through the discharge passage **42** may be assisted by a sweep rod **78** secured to the side wall **30** at the trailing side of the passage **42** and extending tangentially inward adjacent the pan bottom plate **29**. When the gate **71** is closed, the potatoes simply roll over the rod **78** and continue to rotate.

It is believed the operation of the above described bagging machine will be understood from the above description. Briefly, the machine is moved to the desired position for use, on the castor wheels **11**. Graded potatoes are fed into the receiving hopper **27** and elevated in a continuous stream to the discharge chute **28** which deposits them on the pan bottom plate **29**. A bag preparing operator is positioned at one side of the machine and a second operator is positoned at the opposite side for removing the filled bags. A filling operator is positioned at the discharge funnel **43**.

As each bag becomes filled, the filling operator slides the gate **71** circumferentially along the circular side wall **30** to close the passage **42** and simultaneously releases the latch lever **76**. He now rotates the bag plate **55** to bring the next empty bag into position, at which time the latch lever **76** will drop into the receiving notch **75** to hold the latter bag in place for filling. It has been found that two operators, one on each side of the pan, can fill an average of 600 bags per hour with the use of this invention.

While a specific form of the invention has been described and illustrated herein, it is to be understood that the same may be varied within the scope of the appended claims without departing from the spirit of the invention.

Having thus described the invention what is claimed and desired to be secured by Letters Patent is:

1. A continuous bagging machine comprising:

(a) a stationary vertical tubular center post;

(b) a circular pan bottom plate mounted on said center post so as to rotate in a horizontal plane adjacent the top of said post;

(c) a circular side wall stationarily supported from said post about said bottom plate and provided with a passage through which articles may flow from said bottom plate to a discharge opening;

(d) means for supporting a bag below said opening to receive articles discharging from said discharge opening;

(e) a circular bag-supporting element rotatably mounted on said post below said pan bottom plate;

(f) a plurality of spaced bag holding elements mounted on said bag supporting element to be successively moved to a position below said discharge opening;

(g) a vertical center shaft rotatably mounted in said vertical center post and projecting thereabove;

(h) a hub sleeve formed on said bottom plate rotatably surrounding said post;

(i) a cap member secured to said hub sleeve over said post through which said shaft vertically extends, said cap member being secured to said shaft so as to rotate said hub sleeve in unison therewith; and

(j) power driven means for rotating said shaft so as to continuously rotate said pan bottom plate.

2. A continuous bagging machine as described in claim **1** in which the means for mounting said bottom plate on said center post comprises:

(a) a bearing disc surrounding said post below said bottom plate;

(b) means for locking said bearing disc in any desired vertical and circumferential position on said post; and

(c) an anti-friction thrust bearing positioned between said bearing disc and said bottom plate.

3. A continuous bagging machine as described in claim **2** in which the circular side wall is connected to and supported by said bearing disc.

4. A continuous bagging machine as described in claim **1** including:

(a) a vertically elongated cylindrical sleeve rotatably surrounding said post, said bag supporting element being concentrically mounted on the upper extremity of said sleeve;

(b) a bearing collar mounted on said post below said sleeve; and

(c) thrust bearing means positioned between said collar and said sleeve and vertically supporting the latter on said post.

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