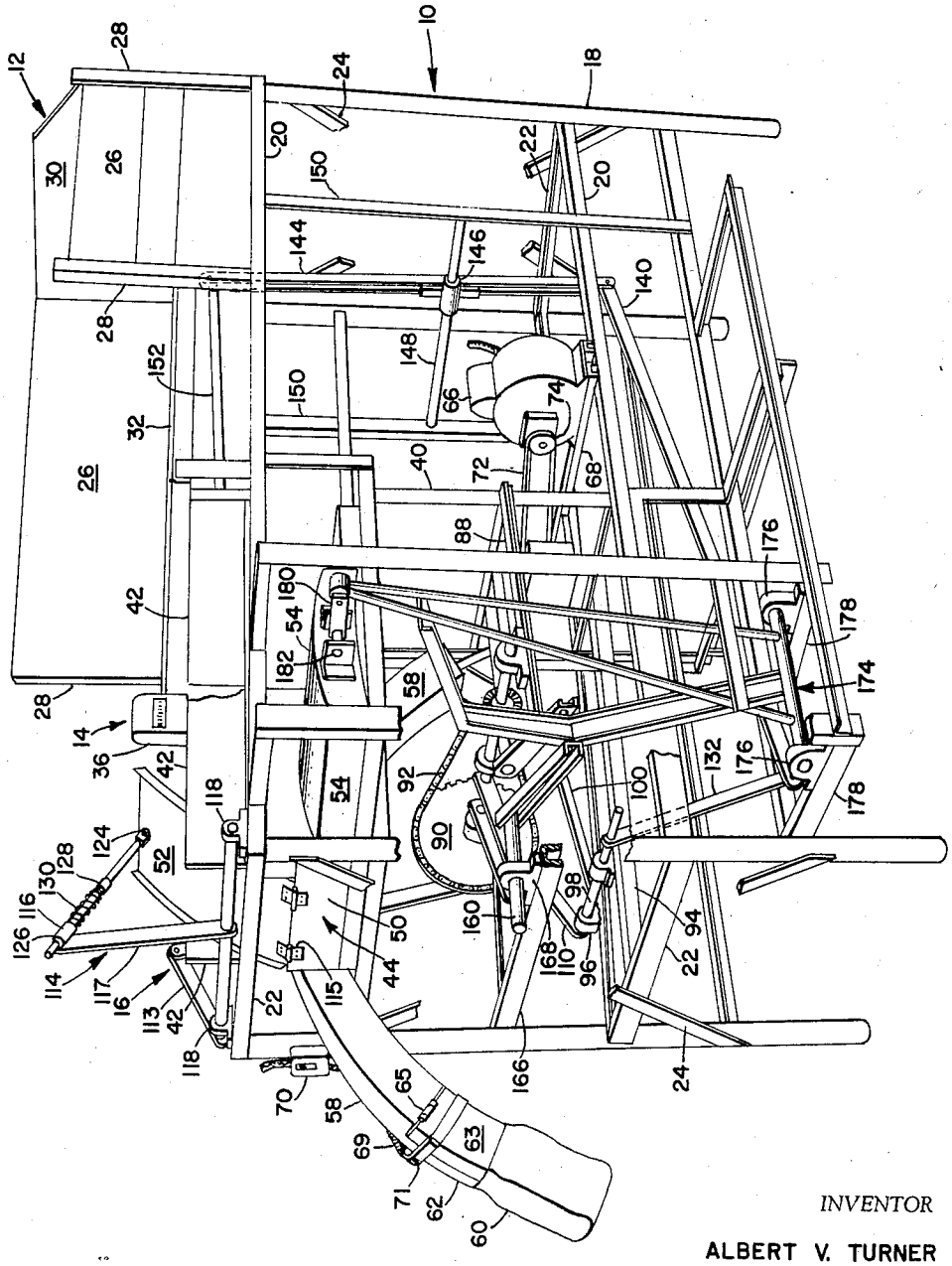
Oct. 20, 1959 A. V. TURNER 2,909,018

PACKAGING MACHINE

Filed Feb. 25, 1957 4 Sheets-Sheet 1

FIG. 1



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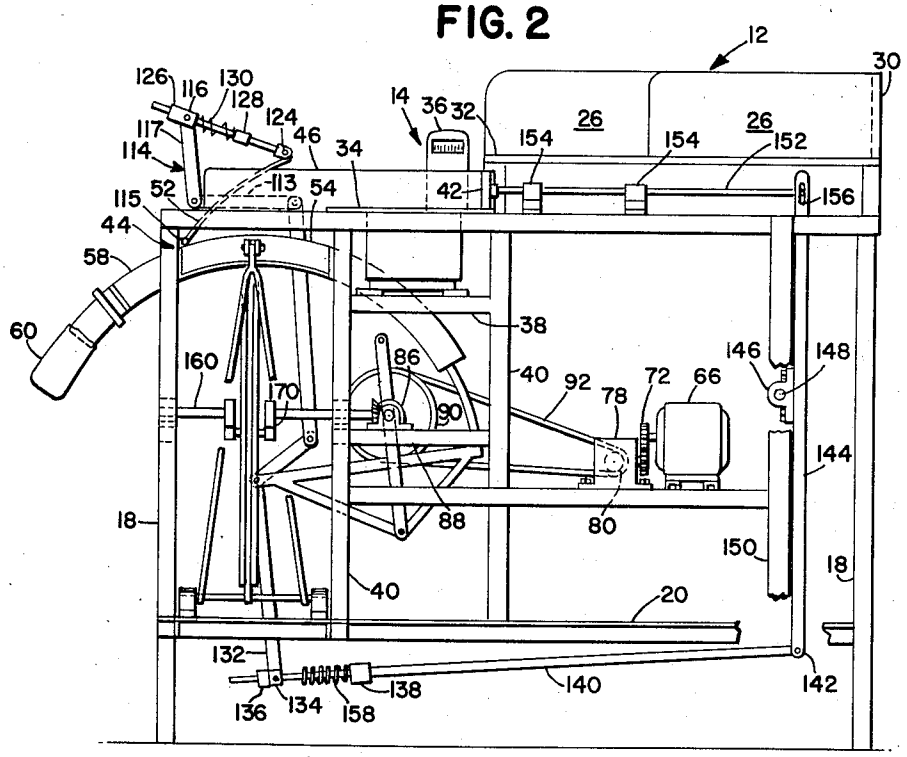
PACKAGING MACHINE

Filed Feb. 25, 1957 4 Sheets-Sheet 2

FIG. 2



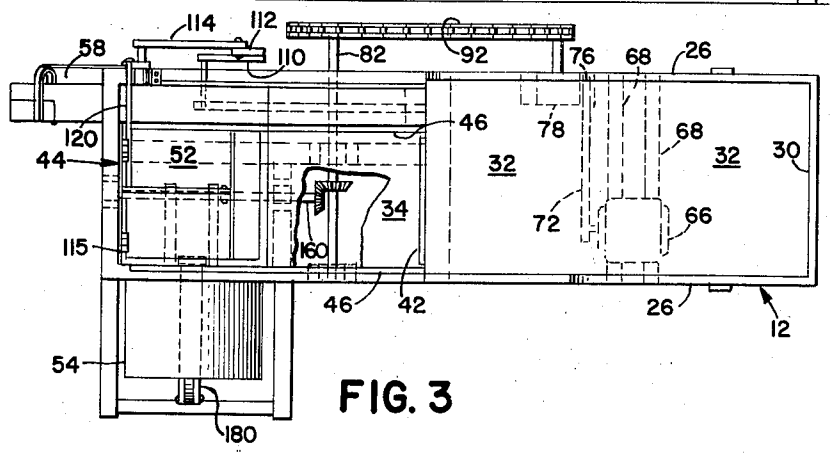


FIG. 3

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Oct. 20, 1959 A. V. TURNER 2,909,018

PACKAGING MACHINE

Filed Feb. 25, 1957 4 Sheets-Sheet 3

FIG. 4

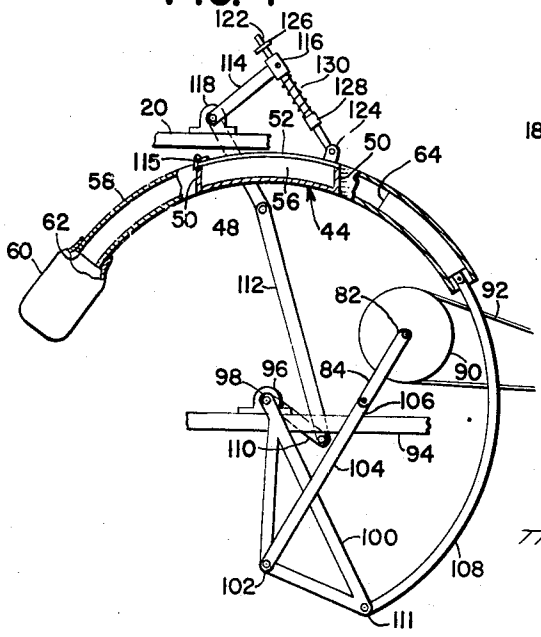


FIG. 5

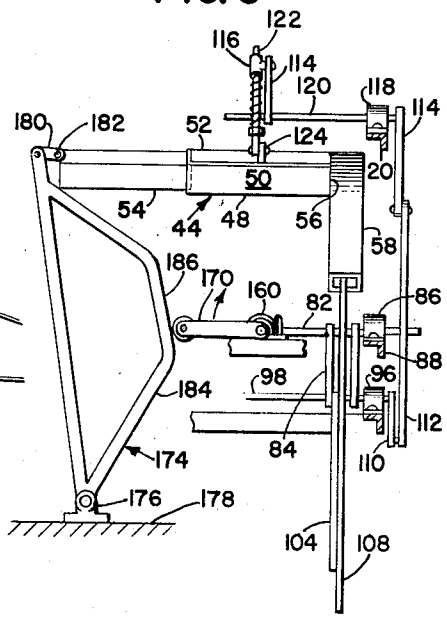
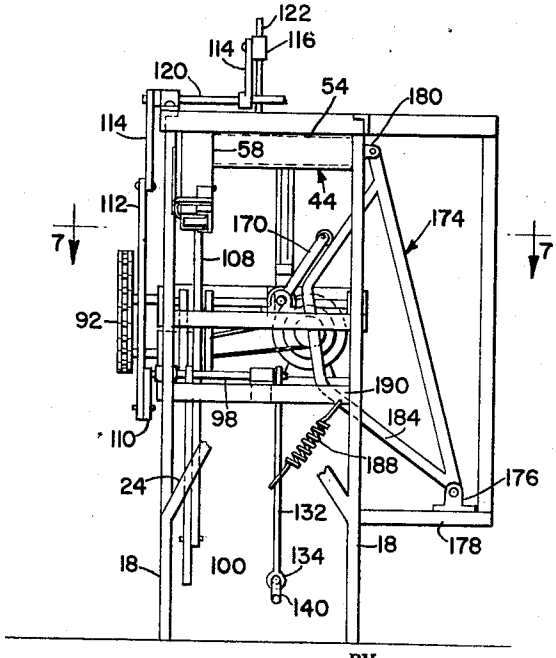


FIG. 6



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Oct. 20, 1959 A. V. TURNER 2,909,018

PACKAGING MACHINE

Filed Feb. 25, 1957 4 Sheets-Sheet 4

FIG. 7

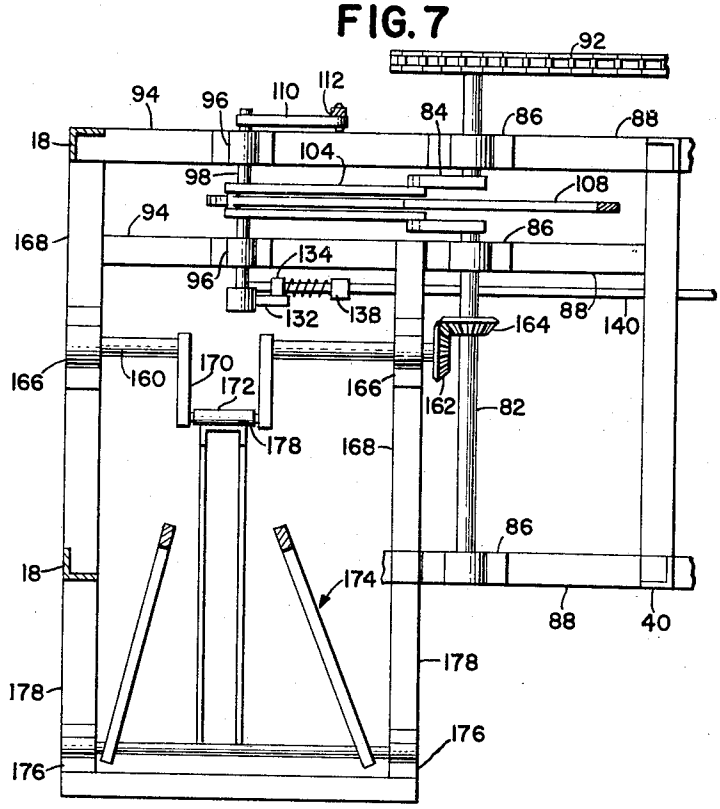
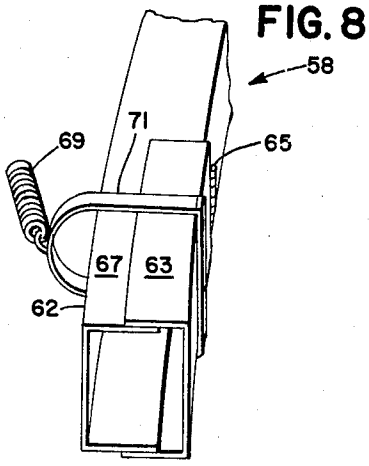


FIG. 8



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PACKAGING MACHINE

Albert V. Turner, Wheelersburg, Ohio

Application February 25, 1957, Serial No. 642,243

12 Claims. (Cl. 53—124)

The present invention relates to a machine for packaging loose material into a container and, more particularly, to a machine for packaging compactible produce, such as kale or the like, into a bag.

In present day marketing of fresh leafy vegetables, such as kale, spinach or the like, the trend is to bag a specified quantity of the produce into cellophane, polyethylene, or the like, bags. After the produce has been packed into the bags, the bags are closed by heat-sealing the open end and then they are placed on the grocers' shelves for customer purchase. Such packaging of produce materially assists in operation of the self-service type of store in that a clerk is not needed to weigh and package produce for the customer.

While the use of bags made of a thermoplastic material such as cellophane, polyethylene or the like, is becoming more popular in the packaging of produce, difficulties have been encountered in the packaging process. Heretofore, such bags have been packaged by hand and such packaging methods require an unusual amount of time and labor. Since cellophane or polyethylene type bags are made from very thin sheets of the material it becomes increasingly difficult to individually handle the bags and stuff produce therein. Unlike the paper bags customarily used in grocery stores, the cellophane or polyethylene type of bags do not render themselves readily available to packaging by hand, as their thin walls do not retain the bags in an open position, such as is expected of the paper bags.

Although the present invention is a machine primarily adapted for the packaging of leafy vegetables, such as kale, spinach or the like, into cellophane or polyethylene bags, it is to be understood that it is within the scope of the present invention to utilize the machine in the packaging of containers other than cellophane or polyethylene bags. Further, it will be understood that the machine can be used to pack material other than leafy type vegetables so long as the material is capable of compacting.

An object of the present invention is to provide a machine which will efficiently and quickly package loose compactible material into a container.

Another object of the present invention is to provide a machine for packaging leafy vegetables, such as kale, spinach or the like, into a thin wall container, such as a cellophane or polyethylene bag.

Still another object of the present invention is to provide a machine which will weigh a specified amount of produce, such as leafy vegetables, and then compact the weighed amount and package it into a container.

A still further object of the present invention is to provide a machine for packaging loose material into a bag, the machine having a minimum number of movable parts operable by a single source of power.

Another object of the present invention is to provide a machine for packaging leafy material into a bag, the machine being capable of compacting the material in

stages so as not to damage the material as it is being transferred into the bag.

Ancillary to the preceding object it is the object of the present invention to provide a machine which not only compacts the leafy vegetables in stages prior to actually packaging the same within the container but also compacts the leafy vegetables from different directions so that no portion of the material being packaged is unduly subjected to pressure and consequently damaged.

These and other objects of the present invention will appear more fully in the following specification, claims and drawings, in which:

Figure 1 is a perspective view of the container packaging machine of the present invention, parts of the machine being broken away so as to better disclose the operating mechanism.

Figure 2 is a side elevational view of the container packaging machine of Figure 1, showing the hopper cover in a position for the hopper to receive material and the means for delivering the material to the hopper in its charge delivering position.

Figure 3 is a top plan view of the machine of Figure 1, portions being broken away to show the drive mechanism.

Figure 4 is a fragmentary sectional view showing the delivery chute for delivering a charge of material to the bag, the ram for the delivery chute being in a retracted position.

Figure 5 is a fragmentary view of the operating mechanism for the hopper plunger looking from the right of Figure 4 and showing the plunger in the retracted position just prior to its movement through the hopper.

Figure 6 is an end elevational view looking from the left of Figure 2, and showing the plunger extending through the hopper.

Figure 7 is an enlarged view, taken on the line 7—7 of Figure 6, portions of the machine being omitted for purposes of clarity.

Figure 8 is an enlarged fragmentary perspective view of the end of the delivery chute for the present invention.

Referring now to the drawings, wherein like character or reference numerals represent like or similar parts, the packaging machine of the present invention includes a frame structure **10**, a material-receiving station **12**, a scale unit **14** and a material compacting and transfer mechanism **16**. Frame structure **10** is provided with a plurality of vertical standards **18** integrally connected by side rails **20** and end rails **22**. Suitable cross bracing **24** may be provided at either end of the frame structure **10**. The components of the packaging machine are supported on suitable cross elements or rails carried by and forming part of the frame structure **10**, as will be explained later in the specification.

Material-receiving station **12** is provided with a pair of laterally-spaced side walls **26** supported on the upper side rails **20** by means of vertical end posts **28** carried integrally on the frame structure. An end wall **30**, supported on an end rail **22** between the two rear vertical posts **28**, is provided to prevent material from falling off the rear of the machine. A floor **32**, positioned between the side walls **26** and the end wall **30**, is adapted to support a supply of the bulky loose material to be packaged. As is shown in Figure 2 the front side wall **26** is shorter than the other or rear side wall **26** and this permits the operator of the machine to remove the loose material from the supply station **12** and place it on the scale unit **14** for weighing.

The scale unit **14** is provided with a material-receiving surface or platform **34** forwardly of and a little below floor **32**, and an indicator **36** easily visible to the operator who transfers the material from the supply station **12** to the platform **34**. The scale unit **14** is supported on a cross member **38**, Figure 2, carried between a pair of

vertical members 40 which make up a portion of the frame 10. A pusher member 42, which extends transversely the entire width of the platform 34, as best shown in Figure 3, is adapted to be reciprocated across the platform so as to discharge a weighed amount of material into a hopper 44.

Hopper 44 forms a part of the compacting and transfer merchanism 16 and is positioned just below and forwardly of the forward edge of the platform 34 of scale 14. A pair of parallel transversely-spaced vertical guard or guide members 46, running longitudinally of the frame structure 10 extend along each side of platform 34 and the hopper 40 so as to prevent material from dropping over the sides of the hopper and the scale platform when the pusher member 42 is transferring it into the hopper. As best shown upon Figures 4 and 5, hopper 44 is provided with an arcuate bottom 48, front and rear walls 50 and an arcuate-shaped cover 52 of the same general size and shape as bottom 48. From Figures 1 and 4 it will be noted that the rear edge of cover 52 is hinged at 115 to the top edge of rear wall 50 so that the cover may pivot from an open position shown upon Figure 1, to the closed position of Figure 4, as and for the purpose subsequently explained. A plunger 54 is arcuate in vertical longitudinal section and dimensioned to have a smooth sliding fit within hopper 44 when the cover is in the closed position of Figure 4. The inner end of plunger 54 is closed and is so mounted as to be slidable from an open position shown upon Figure 5, laterally within the closed hopper, to the closed position of Figure 6. When in the latter position the end wall of the plunger acts as a closure for an opening in the side wall of delivery chute 58, as will be clear from inspection of Figure 5.

Compacting and transfer mechanism 16 also includes an arcuate-shaped delivery chute 58 supported by the frame structure 10. Chute 58 is positioned to pass across and contiguous the open end 56 of the hopper 44 and is also provided with an opening in its wall confronting the hopper, which opening is coextensively aligned with the open end of hopper 44 so that compacted material may pass from the hopper to the delivery chute. The delivery chute 58 has the same radius of curvature as that of the arcuate-shaped hopper 44. The center of this curvature is substantially coincident with the axis of shaft 98, subsequently described. See Figure 4. A container 60, such as a polyethylene or cellophane bag, is adapted to be supported on an open end portion 62 of the delivery chute 58. Referring more particularly to Figure 4, an arcuate-shaped ram 64 has a smooth sliding fit within chute 58 so that it may be reciprocated in the chute to compact and transfer material therein to the bag, the material being previously received in the chute from the hopper. A more detailed description of the operation of cover 52, plunger 54 and plunger 64 will follow later in the specification.

Referring especially to Figure 8, the open end portion 62 of delivery chute 58 is provided with a U-shaped member 63 hinged to the main body of the chute, as indicated at 65. The U-shaped member 63 overlaps a complementary U-shaped portion 67 of the chute 58. A spring member 69 connected to frame structure 10 at one end and to a strap element 71 at its other end normally urges member 63 toward U-shaped portion 67, so as to define a delivery opening of variable size for chute 58. When ram 64 is extended through the chute to transfer a charge therein into container 60, the cross-sectional area of the mouth of the chute can increase because of the hinged mounting for member 63. This applies a gentle pressure on the material as it is discharged into the container. Furthermore, by leaving the mouth of the chute slightly smaller when the ram 64 is retracted, it is easier for an operator to place a container over the end of the chute. Clips or clasps, not shown, may be provided to removably secure the bag over the end of the chute while being filled.

Referring to Figures 1, 2 and 3, a source of power, such as an electric motor 66, is carried on the frame by means of a pair of spaced channel members 68 extending transversely of the frame and welded to the side rails 20. A switch 70, Figure 1, mounted at a convenient place on the frame, such as on one of the legs or standards 18 is provided for controlling motor 66. A belt 72 passing around a drive pulley 74 of motor 66 and a driven pulley 76 of a speed reduction unit 78 transmits power from the motor to the reduction unit. Speed reduction unit 78 is mounted on the frame structure 10 in such a manner that its drive pulley or sprocket 80 rotates on a horizontal axis transversely of frame structure 10.

A crank shaft 82, having a crank arm 84, as best shown in Figure 7, is rotatably supported in bearings or pillow blocks 86 carried on rails 88 which are integrally supported in the frame structure 10. The axis of rotation of crank shaft 82 is parallel to the axis of rotation of the drive sprocket 80. A sprocket 90 is fixed on the outer end of crank shaft 82 and is adapted to receive a drive chain 92 which also passes around the drive sprocket 80 of speed reduction unit 78.

Another pair of horizontally extending longitudinal rails 94, Figure 1, which lie in the same vertical plane as and below the rails 88, are provided with axially aligned pillow blocks 96 in which a shaft 98 is journalled in parallel with shaft 82. The shaft 98 is provided with a lever arm 100 fixed thereto, Figure 4, the lever arm 100 being pivotally connected at 102 to a connecting rod 104. Connecting rod 104 is pivotally connected at 106 with the crank arm 84 of crank shaft 82. An arcuate rod 108 connected to the outer end of lever 100, as indicated at 111 in Figure 4, has its other end connected to the ram 64 in delivery chute 58. Rotation of the shaft 82 by drive chain 92 causes the lever 100 and shaft 98 to rock or oscillate on the axis of said shaft thereby causing the rod 108 and ram 64 to reciprocate in the chute 58 from the position shown in Figure 4 to the position shown in Figure 2, whereby material previously transferred to the chute is compacted and transferred to the bag 60 supported on the end of the chute.

A second lever arm 110 fixed to the inner end of shaft 98 is pivotally connected at its distal end to a connecting rod 112. See Figures 4 and 5. The upper end of connecting rod 112 is pivotally connected to one arm 113 of a bellcrank mechanism generally identified at 114, the other arm 117 of the bell-crank mechanism 114 being provided with a collar or sleeve 116 pivoted thereto. Bell-crank mechanism 114 is journaled in pillow blocks 118 carried on the upper side rails 20. Bell-crank mechanism 114 includes a shaft 120 journaled in bearings 118 mounted upon rails 20 and, as clearly depicted upon Figure 5, arm 117 is spaced from arm 113 axially along this shaft. Both arms 113 and 117 are fixed to shaft 120. Collar 116 is pivoted to the distal end of arm 117 of the bell-crank 114 and is adapted to slide on a rod 122 which is pivotally connected to the cover 52, as indicated at 124 in Figures 4 and 5. Rod 122 is provided with a pair of stop elements 126 and 128 in fixed spaced positions therealong and upon respective opposite sides of sleeve 116. These elements limit and determine the sliding movement of collar 116 upon rod 122. A spring 130, coiled about rod 122 between stop 128 and collar 116, urges the cover 52 to closed position, as shown in Figure 4, when the hopper ram 54 is moving through the hopper 44 to compact and transfer material from the hopper to the chute 58. As is now evident, the rocking motion of the shaft 98, caused by the lever 100, also causes the lever 110 to rock. Rocking motion of the lever 112 by lever 110 also rocks the bell-crank 114 about the axis of shaft 120. Clockwise movement of the bell-crank 114, as viewed in Figure 4, will cause the cover 52 to pivot on its hinge 115 to close the hopper 44, whereas counterclockwise movement of the bell-crank 114 will cause the collar 116 to first slide upon rod 122 and there-

after to engage stop 126 and pivot the cover 52 to the open position shown in Figures 1 and 2. The spring 130 on shaft 122 provides for a lost motion when the bell-crank 114 is rocking in a clockwise direction, as the cover will first close upon the hopper 44 and then the spring will be compressed through further movement of the bell-crank as the ram 54 is moving across the hopper.

Referring now to Figures 1, 2, 6 and 7, a third lever 132 is fixedly connected to the shaft 98 for rocking or oscillating movement therewith. The lever 132 is provided at its lower end with a collar 134 slidably mounted on a rod 140 and which moves between stops 136 and 138 adjustably fixed on the rod. The shaft or rod 140 is pivotally connected at 142 to one end of a rocker arm 144 journaled for rocking motion on a horizontal axis. A bearing 146, carried by the rocker arm 144, permits pivotal movement of the rocker arm on a horizontal shaft 148 supported between a pair of vertical members 150 carried by the frame structure 10. See Figure 1. The upper end of rocker arm 144 has a longitudinal slot which fits the bent or cranked end of a connecting rod 152 which has its forward end secured to the pusher member 42. Connecting rod 152 is mounted by guides 154 for axial reciprocation in a horizontal direction longitudinally of the frame structure 10 so that it can move the pusher member 42, to which it is attached, across the top of the platform 34 of scale unit 14.

As mentioned above, the collar 134 of lever 132 travels between the stops 136 and 138. A spring 158, provided between the stop 138 and the collar 134, provides a lost motion connection for the pusher member 42 in the same manner as the lost motion connection for the hopper cover 52. In other words, when the lever 132 moves in a counterclockwise direction, as viewed in Figure 2, it will first bear against the spring 158 and cause the rod 140 to move toward the right. This will rock the rocker arm 144 in a counterclockwise direction, causing the pusher member 42 to move toward the left of Figure 2. Clockwise movement of the lever 132 will cause the collar 134 to bear against the stop 136 and, thus, pivot the rocker arm 144 in a clockwise direction, pulling the pusher member 42 back to the position shown in Figure 2.

A crank shaft 160, Figures 1, 5 and 7, mounted for rotation on an axis normal to the axis of rotation of crank shaft 82, is provided with a beveled gear 162 which meshes with a beveled gear 164 fixed on the crank shaft 82. Pillow blocks 166, carried on the cross members 168 of frame structure 10, provide bearing supports for the crank shaft 160 which is provided with a crank arm 170, the crank arm preferably having a roller 172 thereon.

A cam or lever member 174, Figures 1 and 5, is pivotally mounted in bearings 176 provided on cross members 178 carried by the frame structure 10. Cam member 174 is provided with a pivot link 180 at its upper end, the pivot link being pivotally connected to the arcuate-shaped hopper plunger 54, as indicated at 182, Figures 1, 2 and 5. The cam member 174 is built up to provide a surface 184 including a portion 186 which provides a dwell in the movement of the hopper ram 54. A spring 188, Figure 6, connected to the cam member 174 at 190 and to the frame structure (not shown) continuously urges the cam member in a counterclockwise direction, as shown in Figure 6. Movement of the cam member 174 in a counterclockwise direction causes plunger 54 to move across the hopper 44 toward the chute 58. Clockwise movement of the cam member, as viewed in Figure 6, will cause the plunger 54 to retract from the interior of the hopper 44 to a position such as illustrated in Figures 1 and 5. Since the crank 160 is continuously rotated in a counterclockwise direction, as viewed in Figure 6, its crank arm 170 will rotate from the position in Figure 6 to a position where it engages the cam surface 184. During the rotation of the crank arm 170 when it is not in engagement with the cam surface 184 of cam member 174, the plunger 54 will be in the position shown in Figure 6 and thus forms a portion of the side wall of the chute 58. When the plunger 54 is in this position, the chute ram 64 operates from the position shown in Figure 4 to a position shown in Figure 2 to compact and then transfer to bag 60, material previously transferred to the chute from the hopper 44 by the ram 54. When the crank arm 170 of the crank shaft 160 engages the cam surface 184 of cam member 174, it will move the cam member in a clockwise direction, as viewed in Figure 6 and a counterclockwise direction, as viewed in Figure 5, so as to withdraw the plunger 54 from the hopper 44 against the spring tension of spring 188. During the time the roller 172 of the crank arm 170 engages the dwell portion 186 of cam surface 184, the plunger 54 is completely withdrawn from the interior of the hopper so as to form a side wall of the hopper. The cam surface 186 is so designed that the plunger will stay in this position, that is, the position shown in Figure 5, until such time as a charge of material has been transferred into the hopper and the hopper cover 52 has been closed to initially compact the material.

The operation of the packaging machine of the present invention is as follows: A supply of material, such as kale or the like, is placed in the material-receiving station 12. An operator then places a container such as a polyethylene bag over the mouth of the delivery chute 60. After the bag 60 is placed on the chute 58, the amount of kale to be packaged is transferred by the operator from station 12 and weighed on the platform 34. The machine is then ready to start and the switch 70 is thrown to energize the motor 66. So long as the motor 66 is energized, a continuous operation occurs as the various units of the machine operate in a timed cycle and all that is necessary is for the operator to continuously remove the filled bags and replace them with empty bags and supply the proper amount of kale to the platform 34 of scale 14.

The weighed kale is pushed by the pusher member 42 off of the platform 34 into the open hopper 44. Rotation of the crank shaft 82 causes the hopper cover 52 to pivot in a clockwise direction from the position shown in Figures 1 and 2 to the position shown in Figure 4, this movement of the cover being in timed relationship with the movement of pusher member 42 as they are both operated by crank shaft 82. The leafy material or kale is compressed down into the arcuate-shaped hopper 44. After the cover is closed, and even though the crank shaft 82 continues to rotate, there is a dwell caused by the lost motion resulting from the sliding movement of the collar 116 or rod 122 against the spring 130. This dwell permits the hopper plunger 54 to travel across the hopper from the position shown in Figure 5 to the position shown in Figure 6. The plunger 54, during the loading of the hopper, is in the position shown in Figure 5 and remains in this position because the crank portion 170 of crank shaft 160 is engaging the portion 186 in the cam surface 184 of cam member 174. While in this position, the hopper plunger 54 forms one of the side walls of the hopper.

After the hopper cover 52 has closed, the crank shaft 160 will have rotated to a position so that the ram 54 begins to move across the hopper due to the spring 188 urging the cam member 174 in a counterclockwise direction, as viewed in Figure 6. Movement of the ram across the hopper compacts the kale in the hopper a second time and in a different direction from that caused by the closing of the hopper cover 52.

Since the cross-section of the delivery chute 58 has less area than a transverse section through the hopper 44, the material being transferred from the hopper to the chute will be compacted into the chute forming a charge for delivery to container 60. The hopper plunger 54 reaches its full extended position into the hopper 44 when

the crank shaft **160** and its crank arm **170** have rotated to the position shown in Figure 6. When in this position plunger **54** closes up the opening **56** between hopper **44** and delivery chute **58** and forms a portion of the side wall of the delivery chute. Crank shaft **160** can rotate counterclockwise, as viewed in Figure 6, 240° before it again engages the cam surface of cam member **174**. This permits the hopper plunger **54** to dwell in the position shown in Figure 6 for a sufficient time to allow the chute ram **64** to compact and transfer the kale into the bag.

Chute ram **64** which is reciprocated by rotation of the crank shaft **82**, begins its forward travel through the chute **58** from the position shown in Figure 4 to the position shown in Figure 2 simultaneously with the beginning of the dwell of hopper plunger **54** within the hopper **44**. The ram **64** engages the charge of kale formed in the chute **58** and further compacts the charge as it transfers the same through the chute into the bag **60**. Ram **64** compacts and transfers the charge in a path substantially normal to the compacting and transferring of the charge from the hopper to the chute and, consequently, the charge is not unduly subjected to pressure in the same direction and damaged. Once the charge has been placed in the bag **60**, the bag is removed from the end of the chute and an empty bag is replaced thereon. The filled bag can then be sealed by heat-sealing the open end, or the like.

While the filled bag **60** is being removed and a new bag **60** is being replaced on the end of the chute, the ram **64** in the chute is being retracted to the position shown in Figure 4. In the meantime, hopper ram **54** will have been retracted and the hopper door **52** will have moved to the open position. In timed sequence with these movements the pusher member **42** also will have retracted to the position shown in Figure 2 and, thus, the operator can again load the platform **34** with a specified amount of kale so that when the cycle of the machine is repeated, another bag can be promptly loaded. The machine may be continuously operated so long as the bags are promptly removed from the chute when filled and the platform **34** is cyclically loaded with a specified amount of the kale to be packaged.

The terminology used in this specification is for the purpose of description and not limitation, the scope of the invention being defined in the claims.

I claim:

1. In a machine for compacting and packaging loose material, a frame, a hopper carried by said frame and having an open top and side, said hopper being arcuate about a normally horizontal axis, a plunger arcuate in a plane normal to said axis and slidably fitting said hopper for reciprocation parallel with said axis, from a first position remote from said open side to a second position closing the same, a lever member pivoted at one end on said frame, an operating connection between said plunger and said lever member, a shaft journaled in said frame, means rotating with said shaft and connected with said lever to oscillate the same and thereby reciprocate said plunger between first and second positions, and power means connected to rotate said shaft.

2. A machine as recited in claim 1, a lid arcuate to the same radius of curvature as said hopper and carried by said frame for movement from a first open position to a second position closing said open top, and means driven by said power means to oscillate said top between said first and second positions in timed relation with reciprocation of said plunger.

3. In a packaging machine, a frame, a delivery chute carried by said frame and arcuate in a normally vertical plane, said chute having an opening in one side wall thereof, a hopper carried by said frame and having its top and one side wall open, said hopper being arcuate in said plane coaxially with and to the same radius of curvature as said chute and mounted with its side wall opening in contiguous correspondence with the side opening in said chute, a lid hinged on said frame for movement from a first open position to a second position closing the top of said hopper, a plunger arcuate in vertical cross section and slidably fitting said hopper for movement in a direction normal to said plane, from a first position remote from said chute, to a second position closing said opening in the side wall of the chute, and power driven means connected with said lid and plunger to sequentially move the same between said first and second positions in timed relation.

4. In a machine for compressing and packaging loose material, a frame, a delivery chute fixed with said frame and arcuately curved in a vertical plane, a hopper arcuate to the same radius of curvature as said chute and fixed in said frame coaxially of and with one end contiguous said chute, there being a passage from hopper to chute, a lid carried by said frame for guided movement from a first position clear of said hopper to a second position closing the open top thereof, a plunger slidably fitting said hopper for translation from a first position remote from said passage, to a second position closing the same, a ram slidably fitting said chute, means mounting said ram for movement about the axis of curvature of said chute, from a first position clear of said passage to a second position past the same, and power driven means carried by said frame and sequentially operating said lid, plunger and ram from first to second positions in timed relation, said means including a rod fixed to said ram and arcuate about said axis.

5. In a machine for compressing and packaging loose material, a frame, a chute fixed with said frame and having a delivery opening at one end, said chute being arcuately curved about an axis, there being an opening in one side wall of said chute, a hopper fixed with said chute over the opening therein and arcuate about said axis, said hopper having an open top, a plunger arcuate about said axis and fitting said hopper for translation therein from a first position remote from the opening in said chute, to a second position closing the same, an arcuate lid carried by said frame for movement from a first position clear of the open top of said hopper to a second position closing said open top, a ram fitting said chute for sliding therein from a first position on one side of the opening therein, past the same, to a second position on the other side of the opening to force compressed material from the chute, and power driven means operating said lid, plunger and ram between their first and second positions in timed sequence and in the order mentioned.

6. In a machine for compressing and packaging loose material, a frame, a delivery chute mounted in said frame and arcuate in a vertical plane about a fixed axis, there being an opening in a side wall of said chute between the ends thereof, a shaft journaled in said frame on said axis, a ram mounted in said chute for sliding therein past said opening, to force compressed material therefrom, a lever fixed on said shaft radially thereof, a rod arcuate about said axis and having one end fixed to said ram and its other end connected with said lever, a hopper having an open side in communication with the opening in said chute, first means operable to compress material in said hopper in a first direction parallel with said plane, second means operable to compress material in said hopper in a direction normal to said plane and into said chute, and power means connected to oscillate said shaft and operate said first and second means in timed relation whereby compressed material is forced into said chute and then ejected from the delivery end thereof by said ram.

7. A machine for compressing and packaging loose material, comprising, a frame, a delivery chute and a hopper fixed in said frame in contiguous relation, there being a passage from hopper to chute, a lid movable from a first open position to a second position closing the open top of said hopper, a plunger reciprocable in said hopper

from a first position remote from said passage to a second position closing the same, a ram slidably fitting said chute and movable therein from a first position on one side of said passage, across the same, to a second position expelling material from said chute at the other side of said passage, a shaft journaled in said frame, a pair of levers fixed at their ends to said shaft radially thereof, means including first and second links connecting the distal ends of said levers with said ram and said lid, respectively, power driven means connected with said shaft to oscillate the same, a cam connected with said plunger, a crank engageable with said cam and rotatable to reciprocate said plunger, said power driven means oscillating said shaft and rotating said crank, in timed relation.

8. In a machine for compacting and packaging weighed batches of loose material, a frame, a shaft journaled in said frame for oscillation about a normally horizontal axis transversely of said frame, an arcuate delivery chute carried by said frame coaxial about said axis and having an opening in one side wall thereof, a ram slidably fitting said chute for movement between first and second positions on opposite sides of said opening, respectively, a lever fixed at one end on said shaft radially thereof, a rod arcuate about said axis and pivoted at one end to the distal end of said lever and fixed at its other end to said ram, first means operable to compact a predetermined batch weight of material and force the same through said opening, power operated means carried by said frame, and driving connections between said power operated means and said first means and shaft to actuate the same in timed sequence, whereby said batch is first compacted and forced into said chute and then moved by said ram from the delivery end of the chute.

9. A machine for compacting and packaging predetermined batch weights of loose material, comprising, a frame, a shaft journaled in said frame for oscillation about a normally horizontal transverse axis, a lever fixed to said shaft radially thereof, a delivery chute on said frame arcuate about said axis and having an opening in one side wall between its ends, a ram slidably fitting said chute for movement past said opening, a rod arcuate about said axis and fixed at one end to said ram and pivoted at its other end to said lever, a hopper arcuate about said axis and in communication with said opening, a plunger fitting said hopper and slidable therein normal to the plane of said chute, cam means connected with said plunger to slide the same between a first position remote from said opening to a second position closing the same, a crank journaled in said frame and rotatable to engage and actuate said cam means, power means, and driving connections between said power means and said shaft and crank to operate said plunger and ram in timed sequential relation.

10. A machine as recited in claim 9, a weighing scale platform carried by said frame adjacent and at one side of said hopper, a pusher, means carried by said frame mounting said pusher for translation over and across said platform to transfer material thereon into said hopper, and means connected with and driven by said shaft to translate said pusher in timed relation with operation of said plunger and ram.

11. A machine for compacting and packaging predetermined batch weights of loose material, comprising, a frame, a normally horizontal shaft journaled in said frame transversely thereof, a delivery chute fixed with said frame above and arcuate about the axis of said shaft, there being an opening in a wall of said chute between the ends thereof, a ram slidably fitting said chute, a hopper carried by said frame with one end in communication with the opening in said chute, a lid carried by said frame for vertical movement from a first position clear of said hopper, downwardly to a second position closing the normally open top thereof, a plunger reciprocably fitting said hopper, first and second levers secured to said shaft radially therefo, a rod arcuate about said axis and connected at its respective ends to said ram and first lever, a link connection between said second lever and lid to operate the lid between its said first and second positions, cam means operable to reciprocate said plunger between a first position remote from the opening in said chute to a second position adjacent said opening, and power driven means carried by said frame and operable to oscillate said shaft and actuate said cam means to move said lid and plunger to second positions in timed sequence and thereafter to move said ram past said opening to expel a compressed batch of material from the delivery end of said chute.

12. In a machine for compressing and packaging loose material, a frame, a delivery chute fixed with said frame and arcuately curved in a vertical plane, a hopper arcuate to the same radius of curvature as said chute and fixed in said frame coaxially of and with one end contiguous said chute, there being a passage from hopper to chute, a lid carried by said frame for guided movement from a first position clear of said hopper to a second position closing the open top thereof, a plunger slidably fitting said hopper when close, for translation from a first position remote from said passage, to a second position closing the same, a ram slidably fitting said chute for movement therein from a first position clear of said passage to a second position past the same and ejecting compressed material from said chute, and power driven means connected with said lid, plunger and ram and sequentially operating the same in timed relation.

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