

March 11, 1958

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2,826,023

APPARATUS FOR STACKING AND PACKING ARTICLES

Filed Jan. 9, 1956

4 Sheets-Sheet 1

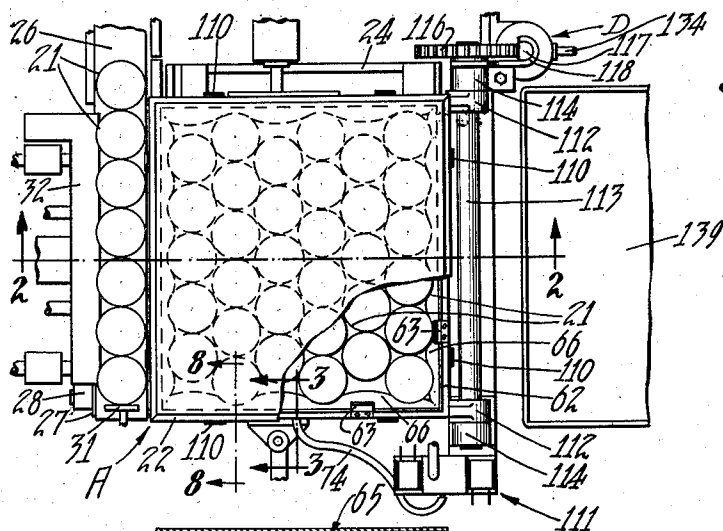


Fig. 1

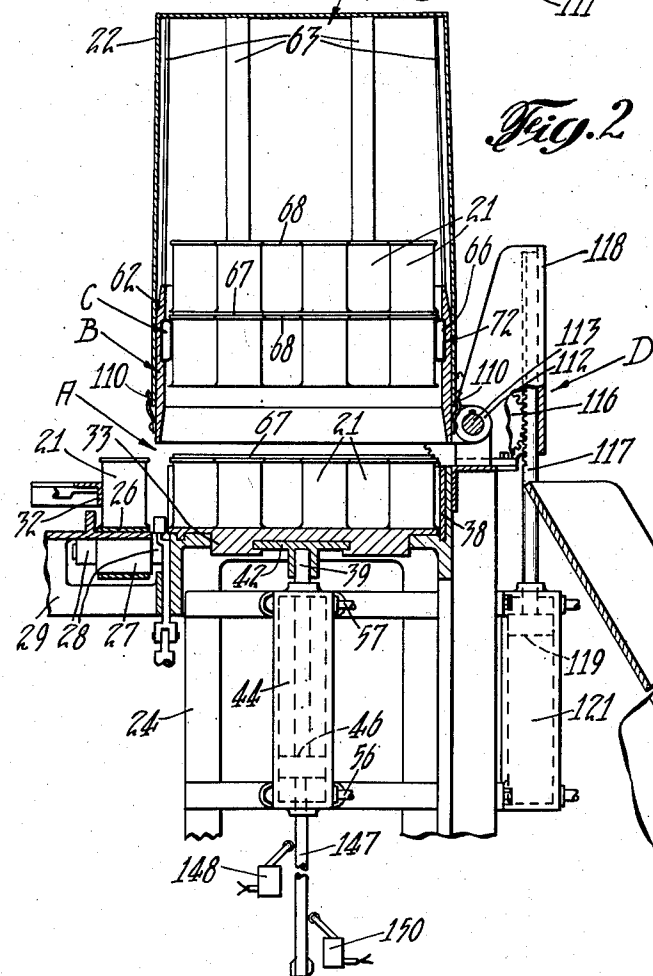


Fig. 2

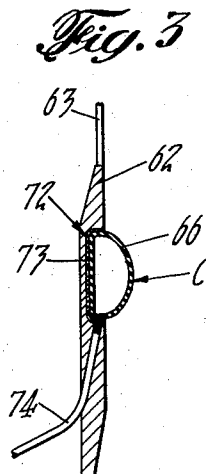


Fig. 3

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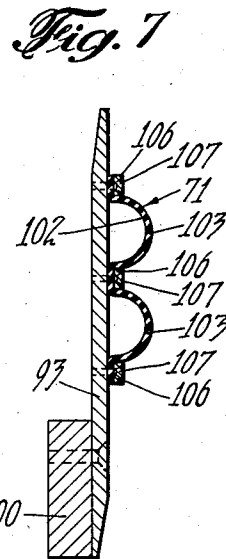
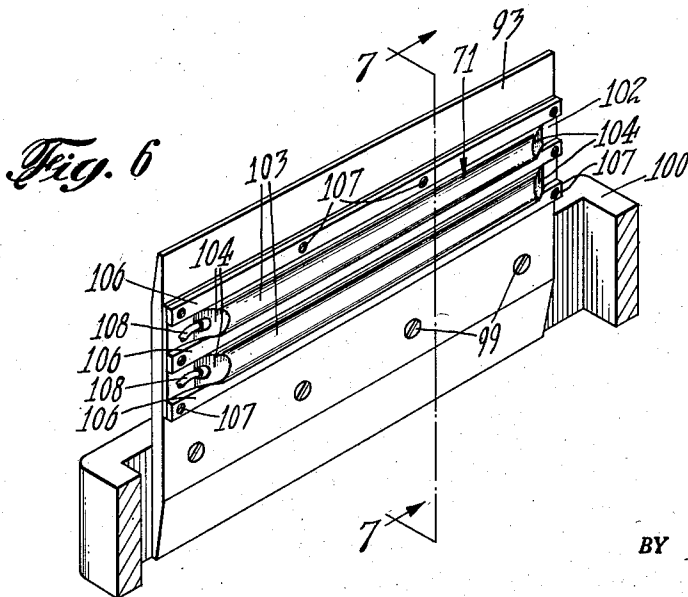
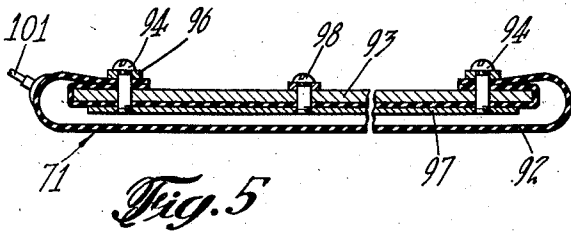
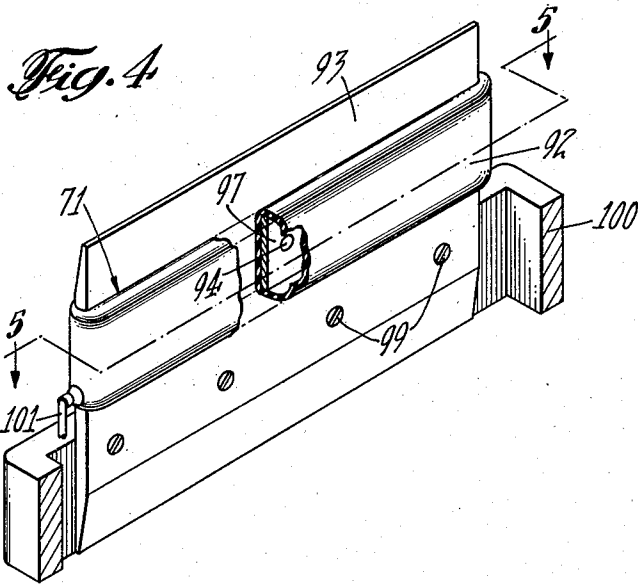
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APPARATUS FOR STACKING AND PACKING ARTICLES

Filed Jan. 9, 1956

4 Sheets-Sheet 2



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Fig. 13

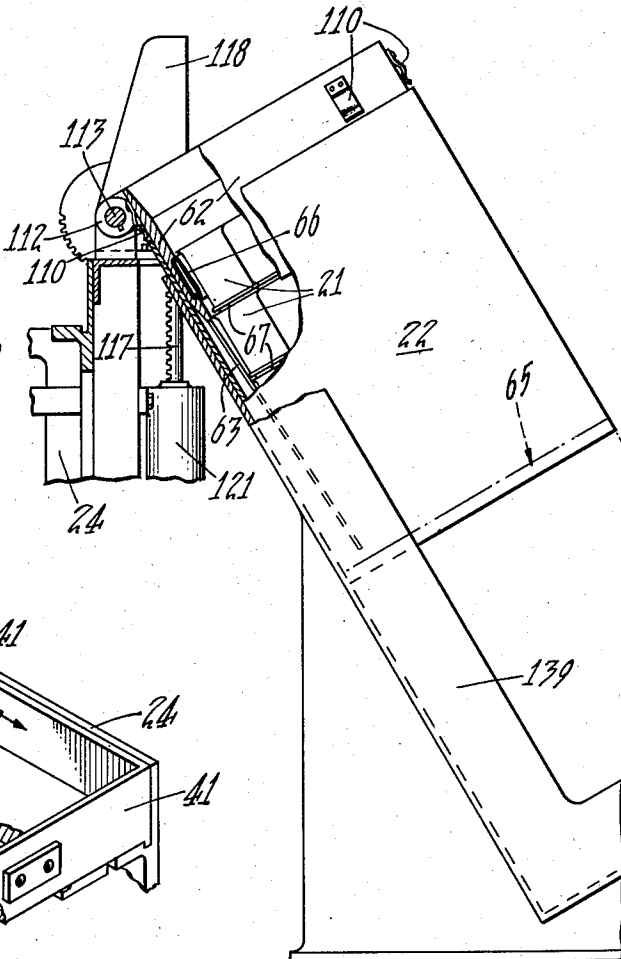


Fig. 11

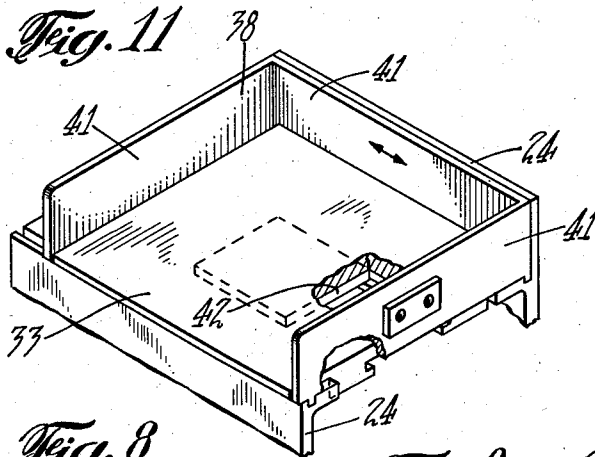


Fig. 8

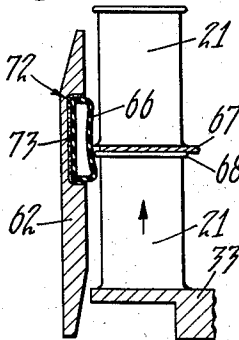


Fig. 9

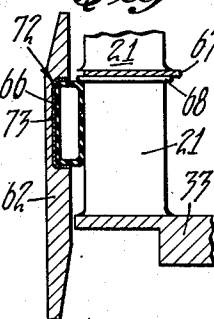
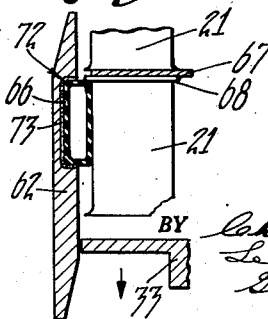


Fig. 10



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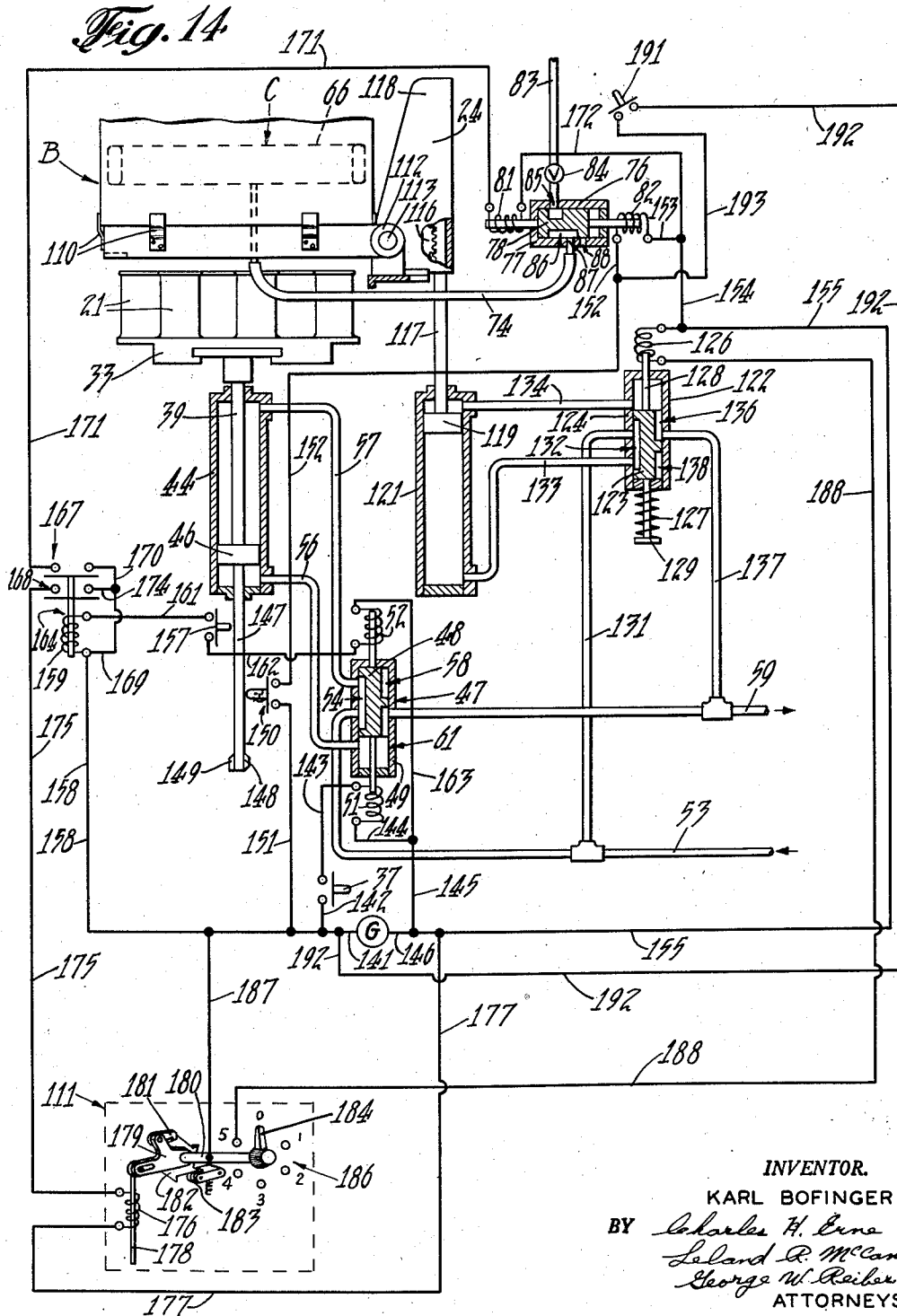
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APPARATUS FOR STACKING AND PACKING ARTICLES

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APPARATUS FOR STACKING AND PACKING ARTICLES

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Application January 9, 1956, Serial No. 557,891

17 Claims. (Cl. 53—164)

This invention relates generally to apparatus for handling articles such as metal cans, and is more particularly directed to mechanism for stacking and packing the articles in containers such as bags or cartons.

Heretofore, such stacking and packing has been done by manually inserting and packing the articles in containers supported with their open tops in convenient positions for access by the operator. However, the present demand for high speed and efficiency in packing articles such as metal cans cannot be met by manual packing means.

It is therefore an object of this invention to provide mechanism for stacking articles in a magazine preliminary to packing them in a container, so that the shape and dimensions of the stack will conform to those of the container.

Another object of the invention is the provision of a resilient gripper in the magazine for holding and supporting articles as they are fed singly or in layers into the magazine.

Another object of the invention is the provision of means for inverting the magazine when it has received a full stack of articles to precipitate the stack from the open upper end of the magazine.

Still another and important object of the invention is the provision of an inflatable gripper and means for inflating it to grip and support the stack as it is being built up in the magazine, and to deflate the gripper during admission of additional articles to the stack and during discharge of the articles from the stack to facilitate those operations.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

Figure 1 is a top plan view of the machine;

Fig. 2 is a vertical sectional view taken substantially along the line 2—2 in Fig. 1 with parts broken away for clearer illustration;

Fig. 3 is an enlarged vertical sectional view taken substantially along the line 3—3 in Fig. 1 showing a resilient inflatable article holding belt in the magazine;

Fig. 4 is an enlarged fragmentary perspective view of the magazine fitted with a modified form of the inflatable article gripper;

Fig. 5 is a horizontal sectional view taken substantially along the line 5—5 in Fig. 4;

Fig. 6 is an enlarged fragmentary perspective view of the magazine fitted with another modified form of the inflatable gripper;

Fig. 7 is a vertical sectional view taken substantially along the line 7—7 in Fig. 6;

Figs. 8, 9 and 10 are enlarged vertical sectional views taken substantially along the line 8—8 in Fig. 1, showing three stages of cooperative action of the resilient gripper

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in admitting articles fed to the magazine and in retaining the articles when the feeding support is retracted;

Fig. 11 is an enlarged perspective view of a tray or platform used as a feeding support for articles;

Figs. 12 and 13 are enlarged fragmentary vertical sectional views taken substantially along the line 2—2 in Fig. 1 showing the mechanism and its turnover device in two positions; and

Fig. 14 is a schematic illustration showing mechanical, pneumatic and electrical devices and their interconnections for effecting the desired cooperative movements of parts.

A preferred or exemplary embodiment of the invention, as shown in the drawings, is a machine for stacking and packing metal cans 21 (Figs. 1 and 2) in a packing container such as a bag 22. The apparatus is supported on a frame 24 and comprises, generally, a can assembling and feeding unit A, a stacking and packing magazine B which receives cans singly or in layer pattern from unit A, a can gripper C in the stacking unit B to retain cans received therein from the feeding unit A, and a turnover device D for inverting the stacking unit to precipitate or facilitate discharge of the cans in stack formation from the stacking unit.

As shown in Figures 1 and 2, empty incoming cans 21 are advanced in single lane processional order to the assembling and feeding unit A on an endless conveyor belt 26 that is suitably driven and guided by pulleys or rolls 27 rotatably mounted in bearings 28 on a table 29 secured to the frame 24.

When the leading can on the belt 26 engages an abutment 31, a pusher blade 32 is moved to the right as viewed in Figures 1 and 2 and pushes before it a row of cans 21 a distance equal to slightly more than a can diameter. The row is thus transferred from the belt 26 onto the surface of an elevator table 33. The pusher blade 32 is then retracted to permit another row of cans to advance on the belt 26 in front of the pusher blade for subsequent transfer in like manner to the elevator table. This operation is repeated until the desired number of rows have been transferred to constitute a layer of cans to be stacked. Figure 1 of the drawings shows a layer of six rows, with the rows arranged in staggered relation. This staggered effect is used when it results in more economy of space than non-staggered or identical successive rows. The stagger effect may be produced by any suitable conventional means which effects movement of the abutment 31 by about one half of a can diameter alternately toward and away from the leading can on the belt 26 for alternate rows until the layer is completed. The arrangement of articles in a layer may vary from a single article to any number of articles in a layer pattern dependent upon the shape and nature of the articles and the container into which they are to be packed.

Upon completion of assembly of a layer of cans on the elevator table 33, a starter switch 37 (Fig. 14) is operated manually to initiate elevation of the table 33 through mechanism which will now be described.

The table 33, as shown in Figs. 2 and 11, is in the form of a substantially rectangular tray 38 on its upper side and is connected on its under side with a piston rod 39. The tray 38 is formed with walls 41 upstanding on three sides of the table 33 to laterally confine a layer of cans on the table. The fourth side is open to admit cans fed to the table by the pusher blade 32. As shown in Fig. 11, the table is slideably mounted for lateral movement on the frame 24, and on a flange 42 at the upper end of the piston rod 39, to facilitate removal of the table laterally from the machine and for quick and accurate replacement of the same or another similar table.

Under the table 33 an elevator cylinder 44 is mounted on the frame 24; and the piston rod 39, at its lower end, is

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secured to a piston 46 mounted in the cylinder for vertical reciprocation by controlled admission and exhaust of air to and from the cylinder. This control is effected by an elevator valve 47 (Fig. 14) comprising a piston 43 reciprocably mounted in a shell or cylinder 49.

Reciprocation of the piston is effected by solenoids 51, 52 alternately energized by means and in a manner to be later described. When solenoid 51 is energized the piston is drawn downwardly as viewed in Fig. 14 so that air under pressure in a conduit 53 enters the shell 49, and is directed through a slot 54 in the piston to a conduit 56 through which the compressed air passes to the lower end of the elevator cylinder 44. There it raises the piston 46 and the elevator table 33 carried thereby.

Meanwhile, air in the upper portion of the cylinder 44 is exhausted or vented through a conduit 57, shell 49, a slot 58 in the piston 48, to a venting conduit 59.

Downward movement of the elevator table and piston 46 results when solenoid 52 is energized. Valve piston 48 is then drawn upwardly to its position shown in Fig. 14 so that air under pressure in conduit 53 is directed through the piston slot 54 to conduit 57 and the upper portion of elevator cylinder 44 to drive the elevator piston 46 downwardly. Venting of the air in the lower portion of the elevator cylinder is meanwhile effected through conduit 56, shell 49, a slot 61 in the valve piston 48, and the venting conduit 59.

As the elevator table is raised with a layer of cans thereon, the cans enter the stacking and packing magazine B. This unit comprises a substantially rectangular magazine frame 62 (Fig. 2) pivotally mounted on the frame 24 and having guides or wall members 63 fixed to and extending upwardly from the walls of the frame 62. The magazine is larger in horizontal or transverse inner dimensions than the transverse dimensions of a layer of cans, and its height is greater than the height of a stack of cans to be packed. Furthermore, its outside transverse dimensions are only slightly greater than its inner transverse dimensions so that a packing container, such as the bag 22, for receiving the stack may be inverted over the sides and open upper end or outlet 65 of the magazine.

Within the magazine frame 62 a resilient gripper 66, which may be in the form of an inflatable belt, is secured to the inner walls of the magazine at a height from the table 33 somewhat greater than the height of a can or the stroke of the piston 46 which raises each layer of cans into the magazine. The gripper also extends slightly into the path of the cans so that it grips those cans at the periphery of a layer and retains the layer in elevated position while the table 33 is retracted for assembly of another layer thereon.

As shown in the drawings, open cans are fed to the elevator table in inverted position, and a separator sheet 67 is placed manually or by any suitable mechanism on the top of each layer excepting the first. Inversion of the can assures a better purchase by the gripper 66 on the more rigid areas of the cans adjacent their double seams 68 (Figs. 2, 9 and 10), and the separator sheets 67 protect the flanges at the open ends of the cans. Articles other than cans may require the same or different handling, dependent upon their nature and conformation.

In Figure 8, a single can 21 representing a second layer of cans on the elevator platform 33 is shown in the process of raising a superimposed layer which had previously been raised into the grip of the inflatable belt 66. Figure 9 shows the second layer fully raised by the elevator and engaged by the belt 66 just below the double seam 68. Fig. 10 shows the second layer now supported by the gripper belt and in turn supporting the layer above it while the elevator table lowers away from the belt-supported layers to receive a third layer and raise it in like manner. This operation is repeated until the desired number of layers are raised into the magazine.

During these layer-raising operations, the belt 66 pref-

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erably is alternately deflated and inflated at appropriate times. For instance, the belt as shown in Figure 8, is deflated to facilitate upward movement of the cans with a minimum of, or no friction between them and the belt; and in Figures 9 and 10 the belt is inflated, to provide a maximum grip on the cans.

The belt 66 may be continuous as shown in Figs. 1, 2 and 3 or it may comprise a series of contiguous or spaced sections 71 as shown in Figs. 4 through 7. Where the belt is continuous, it is set into a groove 72 formed in the magazine frame 62 (Figs. 2 and 3) and is there held by a suitable adhesive 73. An air conduit 74 (Fig. 3) communicating with the interior of the belt leads therefrom to a valve 76 (Fig. 14). The valve comprises a cylinder 77 within which a piston 78 is reciprocable upon alternate energization of solenoids 81, 82. The means for and timing of energization of the solenoids will be later described. As shown in Fig. 14, the piston 78 is drawn to the left by solenoid 81 and compressed air from a conduit 83, passes through a pressure control valve 84 and into the cylinder 77 through a port 85, thence through a cylindrical groove 86 in the piston to a port 87 from which the air passes through the conduit 74 to inflate the gripper belt 66 to a pressure determined by the setting of the pressure control valve 84.

When solenoid 82 is energized, the piston 78 is drawn to the right (Fig. 14) which moves the groove 86 out of communication with the inlet port 85 and into communication with a vent port 88. The flow of air under pressure from conduit 83 is thus stopped and air in the inflated belt flows from it through the conduit 74, port 87, groove 86 and vent port 88 to deflate the gripper belt 66.

As mentioned above, the gripper belt may be sectional in form as shown in Figures 4 through 7. Such sections may be disposed in appropriate numbers and locations around the inlet to the magazine, dependent upon the nature and form of the article or articles to be held by the gripper.

The gripper section 71 shown in Fig. 4 comprises a length of tubing 92 wrapped partially around a plate 93 with the open ends of the tube bent around opposite edges of the plate 93 and against the back of the plate. It is there secured by screws 94 which pass through clamping washers 96, the ends of the tubing, the plate 93, and one wall of the tubing to threadedly engage a long clamping bar 97 within the tube. One or more additional screws 98 may be used similarly between the tube ends to secure the intermediate portion of the tubing to the plate 93. The plate 93 is fastened by screws 99 to a magazine frame 100.

An air inlet 101 in the tubing 92 may establish communication with a conduit, such as that shown at 74 in Fig. 14, so that the sections may be inflated and deflated in the same manner as above described for the belt 66.

A modified structure of the gripper section 71 is shown in Figures 6 and 7. Here the gripper is formed from a sheet of resilient material 102 such as rubber. One or more ridges or elongated blisters 103 are raised in parallel formation in the sheet 102 with their ends 104 terminating short of the edges of the sheet. Clamping strips 106 extend along the edges of the sheet and between the ridges 103, parallel with the ridges. Screws 107 pass through the strips 106 and the sheet 102 to threadedly engage the magazine plate 93 and thus clamp and seal the sheet against the plate. Air inlets 108 in the ridges 103 may establish communication between the hollow interiors of the ridges and one or more conduits 74 so that the ridges may be inflated or deflated in substantially the manner, above described, in which the continuous belt 66 is inflated and deflated.

While the layers of cans are being stacked in the magazine, the bag 22 may be inverted over the outlet 65 and sides of the magazine, and the edges of the bag at its open

end passed under spring clamps 110 (Figs. 2, 12, 13, 14) to hold the bag in place.

When a predetermined number of layers forming a completed stack have been fed into the magazine, a layer counting unit 111 (Figs. 1 and 14) initiates actuation of the turnover unit D which inverts the magazines to discharge the stack of cans therefrom. To this end the magazine frame is formed with lugs 112 (Figs. 1 and 2) fixedly mounted on a shaft 113 that is journaled in bearings 114 formed in the frame 24 to provide a pivotal mounting for the magazine.

One end of the shaft 113, extending beyond its bearing 114, is fixed to a gear 116 that meshes with a vertically disposed rack 117 slideably mounted in a guideway 118 formed in the frame 24. The lower end of the rack 117 is secured to a turnover piston 119 reciprocally mounted in a pneumatic turnover cylinder 121 mounted on the frame 24.

Reciprocation of the piston 119 is effected by controlled admission and exhaust of air to and from the cylinder by a turnover valve 122 (Fig. 14) comprising a valve piston 123 reciprocally mounted in a shell or cylinder 124. Reciprocation of the valve piston is effected by a solenoid 126 and an opposing spring 127 operating, respectively, on rods 128, 129 extending axially from opposite ends of the piston.

As shown in Fig. 14, solenoid 126 is deenergized and piston 123 is drawn downwardly by spring 127. With the valve piston in this position, compressed air flows from the conduit 53 through conduit 131 to the valve cylinder 124, along a slot 132 formed in the piston, and thence through a conduit 133 to the lower end of the turnover cylinder 121 where the compressed air drives the turnover piston 119 upwardly to the position shown in Fig. 14. As the piston is thus raised, air in the upper portion of the cylinder is exhausted through a conduit 134 to the upper portion of the valve 122, through a slot 136 in the valve piston 123, and outwardly from the valve through exhaust conduits 137 and 59.

When the magazine B is filled with the desired number of cans in stack formation, the solenoid 126 is energized, in a manner to be later described, and the piston 123 is thereupon drawn upwardly (Fig. 14) so that air under pressure in conduit 131 is directed by valve piston slot 132 to conduit 134 through which it flows to the upper portion of the turnover cylinder 121. Here it drives the turnover piston 119 downwardly and air in the lower portion of the cylinder is exhausted through conduit 133, the lower portion of valve cylinder 124, a slot 138 in the valve piston and exhaust conduits 137 and 59.

As the piston 119 is thus driven downwardly, it draws with it the rack 117 which, through its meshing engagement with gear 116, rotates the gear, shaft 113 and the magazine D in a clockwise direction, as viewed in Figs. 2, 12, 13 and 14.

As shown in Fig. 12, the magazine and its charge has rotated more than ninety degrees; the cans are still gripped by the belt 66; and the bag 22 is still held by the spring clamps 110. However, just before gravity precipitates the charge from the magazine, the belt 66 is deflated, as shown in Fig. 13 and the stacked cans slide freely through the magazine outlet 65 where they engage the bottom of the bag 22 and carry it downwardly with them, away from the spring clamps 110, so that the filled bag drops from the magazine into a suitable place of deposit, such as an inclined cradle 139 from which the filled bag may be readily removed for subsequent handling.

A brief review of the operations of the machine follows with more particular emphasis on the timing of the several operations as effected by electrical and mechanical devices shown schematically in Fig. 14.

When a layer of cans is arranged on the elevator table 33, the operator closes the normally open starter switch 37. Current then flows from a source of electrical power

such as a generator G, through wires 141, 142, switch 37, wire 143, solenoid 51, wires 144, 145, 146 back to the generator. The solenoid 51 is then energized and, as explained above, this draws the elevator valve piston 48 down to admit air under pressure to the lower portion of the elevator cylinder 44 and thus raise the piston 46 and the table 33. Simultaneously, a rod 147, secured to the underside of the elevator piston, is also raised.

A gripper belt deflating cam 148 and an elevator lowering cam 149 are secured to the rod 147. As this rod is raised, cam 148 closes a normally open switch 150. Current then flows from the generator G through wires 141, 151, switch 150, wire 152, solenoid 82, wires 153, 154, 155, 146 to the generator G. Solenoid 82 is thus energized to draw valve piston 78 toward it. As explained above, this results in venting air from the gripper belt 66 through the valve port 88, thus deflating the belt in time to facilitate passage through the belt of the end seams of the rising cans.

As soon as the upwardly moving cam 148 passes the switch 150, the latter immediately assumes its normally open position thus deenergizing solenoid 82 and leaving the valve piston 78 in belt deflating position but free to be moved in the opposite direction.

Switch 150 is of a conventional construction which permits its operation only during the upward movement of the cam 148, as above mentioned. On its downward movement, the cam engages the operating button of the switch, but this button is hingedly mounted so that it yields downwardly under spring tension, and permits the cam to pass without operating the switch.

Upon further upward movement of the rod 147, cam 149 closes the normally open switch 157 thereby closing a circuit so that current flows from the generator G through wires 141, 158, solenoid 159, wire 161, switch 157, wire 162, solenoid 52, wires 163, 145 and 146 to the generator G. Solenoids 159 and 52 are thus energized thereby respectively operating a relay 164 and raising the elevator valve piston 48. Operation of the relay 164, closes a normally open inflator switch 167 and a layer counter switch 168.

Closing switch 167 permits current to flow from the generator G through wires 141, 158, 169, 170, switch 167, wire 171, solenoid 81, wires 172, 154, 155, 146 to the generator. Solenoid 81 is thus energized to draw valve piston 78 to the position shown in Fig. 14. As explained above, this permits air under pressure to flow from conduit 83 to the gripper belt 66 and to inflate it to grip the cans as shown in Figs. 2, 9 and 10.

Closing switch 168 permits current to flow from the generator G through wires 141, 158, 169, 174, switch 168, wire 175, a solenoid 176, and wires 177, 146 to the generator. Thus solenoid 176 is energized. An armature 178, normally biased to retracted position, is pivotally connected to the free end of a pawl lever arm 179 pivotally mounted for free rotation on a shaft 180. The energized solenoid raises the armature which in turn rocks the lever 179 and a pivotally attached pawl 181 in a clockwise direction (Fig. 14). The pawl, in engagement with a tooth of a ratchet wheel 182, rotates the wheel against a tension of a spring pressed roller 183 the angular distance between two teeth. The wheel 182 is fixed to one end of the shaft 180 and a rotatable contact 184 of a magazine turnover switch 186 is secured to the opposite end of the shaft. Rotation of the wheel 182 thus rotates the contact 184 through the same angular distance each time the solenoid 176 is energized by the raising of a layer of cans into the magazine. This angular distance, as shown in Fig. 14, is 60 degrees, and the several positions of the rotating contact 184 are indicated by the positions of stationary contacts 1, 2, 3, 4, 5 and the starting point 0. In this instance, a stack of five layers is desired, so that contact 5 is connected to the magazine turnover circuit. Therefore, when solenoid 176 has been energized five times, the rotating contact will

close a circuit with the stationary contact 5. Current will then flow from the generator G through wires 141, 187, shaft 180, rotating contact 184, stationary contact 5, wire 188, solenoid 126, wires 155, 146 to the generator. Thus the turnover solenoid 126 is energized which, as explained above, moves the turnover valve piston to its upper position so that air under pressure is conducted to the upper portion of the turnover cylinder 121 thereby forcing the piston down and rotating the magazine on its pivotal mounting and toward the discharge cradle 139.

As above explained, solenoid 52 is energized on each completion of an upward movement of the elevator table, and this is followed by a return downward movement of the table 33. However, on the elevation of the fifth layer of cans, the magazine is rotated to inverted position and the belt 66 remains inflated during most of this inverting movement. To effect deflation of the belt just before completion of this movement, so as to facilitate discharge of the stacked cans, a switch 191 (Fig. 14) is interposed in the path of the magazine frame so that the switch is closed when the magazine has assumed approximately the position shown in Fig. 12. When the switch 191 is thus closed, current flows from the generator G through wires 141, 192, switch 191, wires 193, 152, solenoid 82, wires 153, 154, 155 and 146 to the generator, thus energizing solenoid 82 which, as explained above, draws the valve piston 78 toward the right (Fig. 14) and permits the air in the belt 66 to vent through the valve port 87. The gripper belt 66 is thereby deflated to the condition shown in Fig. 13 so that the last layer of cans to be added to the stack is released by the gripper belt to gravitate with the other cans in the stack and the bag 22 into the packed bag receiving cradle 139.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. In an apparatus for stacking articles, the combination comprising a magazine for receiving and forming a stack of articles therein, said magazine having an opening therein, means for feeding articles successively through said opening into the magazine, and an inflatable resilient gripper at said opening and disposed laterally of and substantially surrounding the path of articles thus fed into the magazine for yieldingly and laterally engaging an article at said opening to support and retain said article until another article is similarly fed into said magazine.

2. The apparatus combination of claim 1 provided with means for deflating the gripper while the feeding means moves an article into the magazine opening and for inflating the gripper when the article is at said opening to grip and support the article.

3. The apparatus combination of claim 2 wherein the gripper is an inflatable belt substantially surrounding the path of the articles as they are fed to the magazine.

4. The apparatus combination of claim 2 wherein the gripper is an inflatable tube disposed alongside the path of the articles as they are fed to the magazine.

5. The apparatus combination of claim 2 wherein the gripper comprises a plurality of hollow inflatable ridges disposed alongside the path of the articles as they are fed to the magazine.

6. In a machine for stacking and packing articles, the combination comprising a magazine normally disposed in substantially vertical position and pivotally mounted for oscillation in a substantially vertical plane to an inverted position, said magazine having an article inlet at its normally lower end and an article outlet at its opposite end, means for feeding articles successively into said magazine upwardly through said inlet, a resilient gripper in said

inlet and disposed laterally of the path of an article thus fed to the magazine for yieldingly and laterally engaging the article to support it and any layer of articles above it in the magazine, and means for swinging said magazine on said pivotal mounting to inverted position whereby said articles are precipitated from the magazine in stack formation.

7. The machine combination of claim 6 wherein the resilient gripper is inflatable and substantially surrounds the path of articles being fed to the magazine.

8. The machine combination of claim 7 provided with means for inflating the belt when the article is fully raised to grip the article and to support it and any articles above it in the magazine and for deflating the belt to release the articles engaged thereby while an article is raised into the magazine and while a stack of articles is precipitated from the magazine.

9. The machine combination of claim 8 wherein the means for swinging the magazine to inverted position includes a counting device for automatically actuating the swinging means when said device has counted a predetermined number of articles advanced by said feeding means into the magazine.

10. In a machine for stacking and packing articles, the combination comprising a magazine having a plurality of guides normally disposed in substantially vertical positions forming the side walls of the magazine for guiding articles to stack formation between the walls and for holding a packing container over and substantially enveloping the walls, said magazine being pivotally mounted for oscillation in a substantially vertical plane to an inverted position, an inlet at the normally lower end of the magazine and an outlet at the opposite end through which articles are, respectively, admitted to and discharged from the magazine, means for feeding articles successively into said magazine upwardly through said inlet, a resilient gripper in said inlet and disposed laterally of the path of an article thus fed to the magazine for yieldingly and laterally engaging the article to support it and any articles above it in the magazine, and means for swinging said magazine on said pivotal mounting to substantially inverted position whereby said articles in stack formation and the enveloping packing container are precipitated together from the magazine.

11. The machine combination of claim 10 wherein the means for swinging the magazine to inverted position includes a counting device for actuating the swinging means when said device has counted a predetermined number of articles advanced by said feeding means into the magazine.

12. In an apparatus for stacking articles, the combination comprising a magazine for receiving and forming a stack of articles therein, said magazine having an opening through which articles are admitted thereto, means for feeding articles assembled in a predetermined layer pattern successively through said opening into the magazine, and a resilient inflatable gripper at said opening and substantially surrounding the path of articles thus fed into the magazine for yieldingly and laterally engaging the articles at the periphery of a said layer to support and retain said layer in its predetermined pattern until another layer is similarly fed to the magazine.

13. The apparatus combination of claim 12 provided with means for deflating the gripper while the feeding means moves a layer of articles into the magazine and for inflating the gripper when the layer is at said opening to urge the inner wall of the gripper into holding engagement with the articles at the periphery of the layer pattern and thereby support the engaged layer.

14. In a machine for stacking and packing articles, the combination comprising a magazine normally disposed in substantially vertical position and pivotally mounted for oscillation in a substantially vertical plane to an inverted position, said magazine having an article

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inlet at its normally lower end and an article outlet at its opposite end, means for feeding articles assembled in a predetermined layer pattern into said magazine upwardly through said inlet, a resilient inflatable gripper in said inlet and substantially surrounding the path of a layer of articles thus fed to the magazine for yieldingly and laterally engaging the articles at the periphery of said layer to support it and any layer of articles above it in the magazine, and means for swinging said magazine on said pivotal mounting to inverted position whereby said articles are precipitated from the magazine in stack formation.

15. The machine combination of claim 14 provided with means for inflating the gripper when the layer of articles is fully raised to hold the layer and to support it and any layer above it in the magazine and for deflating the gripper to release the articles engaged thereby while a layer of articles is raised into the magazine and while a stack of articles is precipitated from the magazine.

16. The machine combination of claim 14 wherein

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said means for swinging the magazine includes a counting device for automatically actuating said swinging means when said device has counted a predetermined number of layers of articles advanced by said feeding means into the magazine.

17. The machine combination of claim 14 wherein the magazine comprises a plurality of guides normally disposed in substantially vertical positions and forming the side walls of the magazine for guiding the layers of articles to stack formation between said walls and for holding a packing container over and substantially enveloping the walls, whereby the magazine, when inverted by said swinging means, will precipitate the stacked articles and the packing container simultaneously therefrom with the articles disposed within the container.

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