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2,924,922

APPARATUS FOR USE IN PACKAGING OF PRODUCT

Original Filed Jan. 9, 1957

3 Sheets-Sheet 1

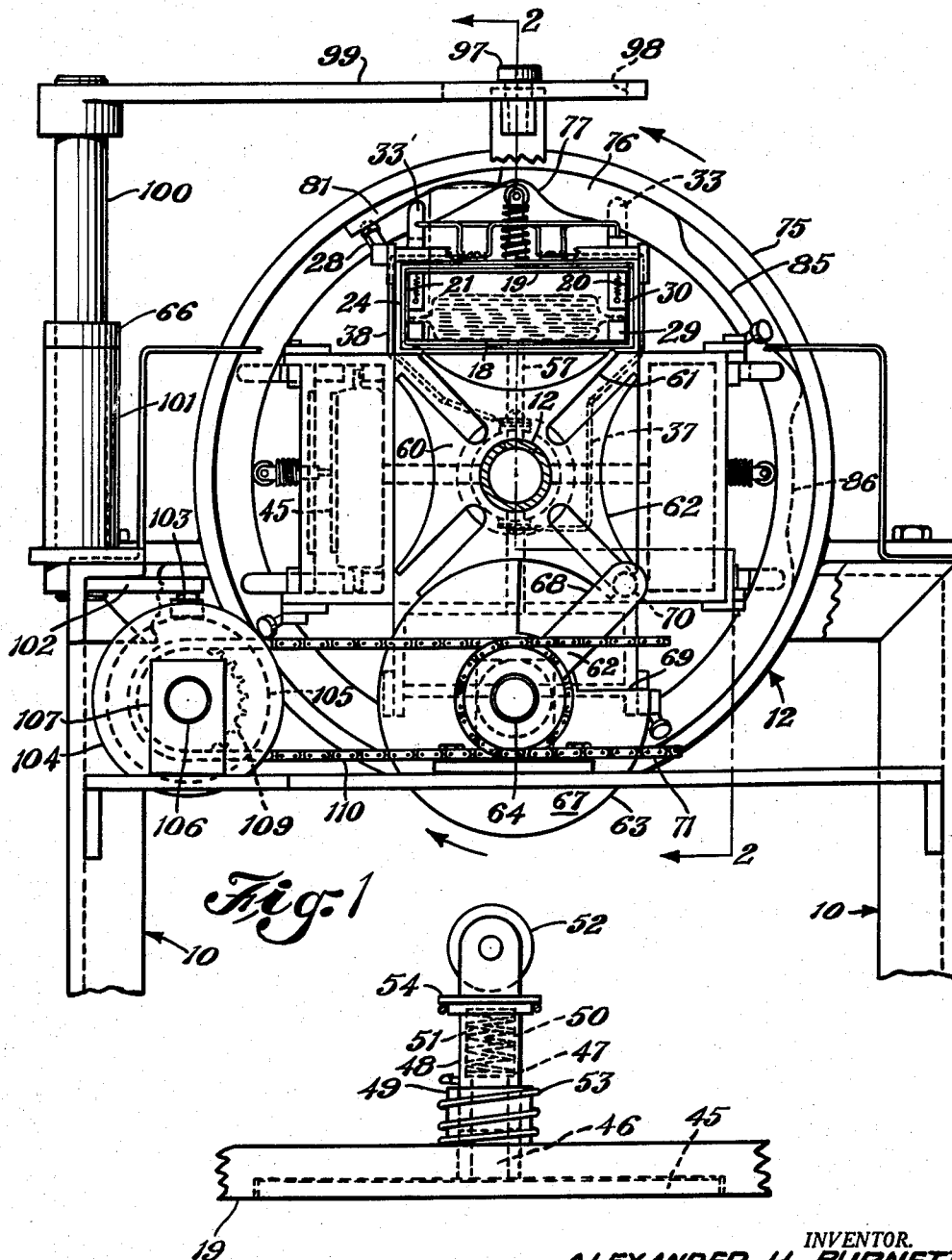


Fig. 3 INVENTOR.
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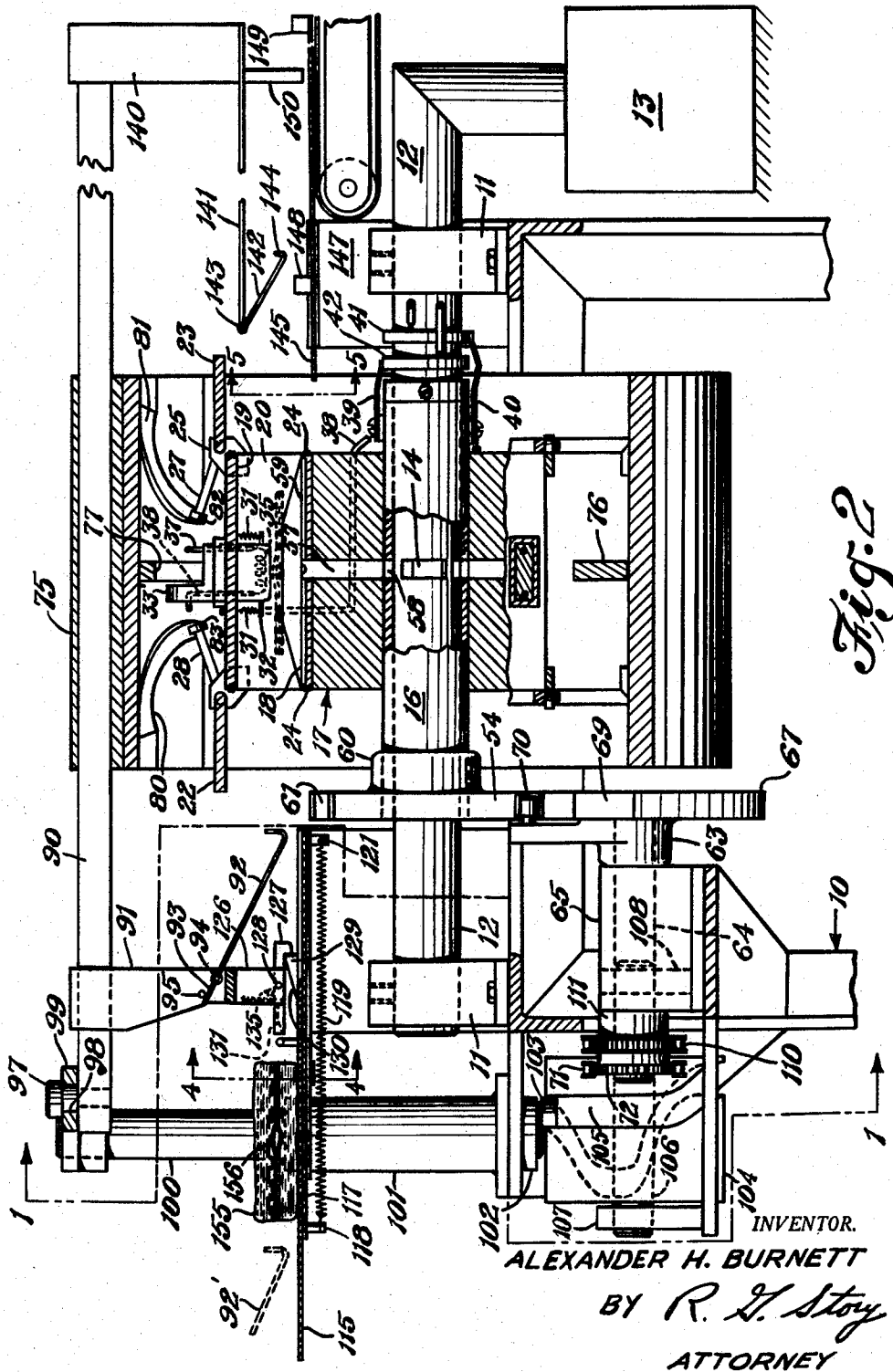
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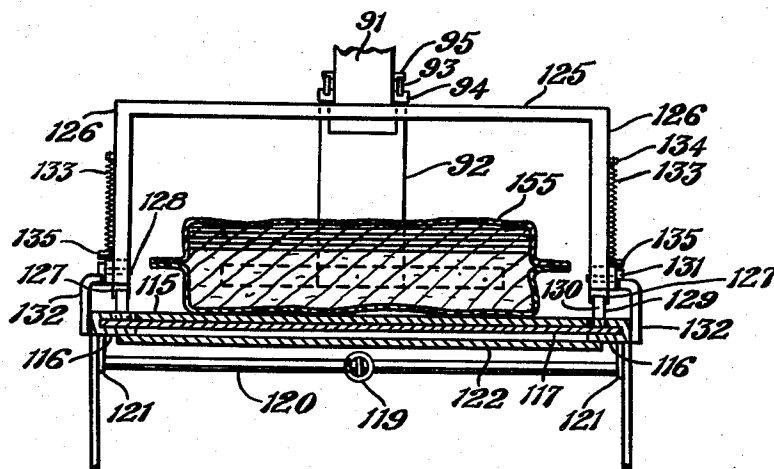


Fig. 4

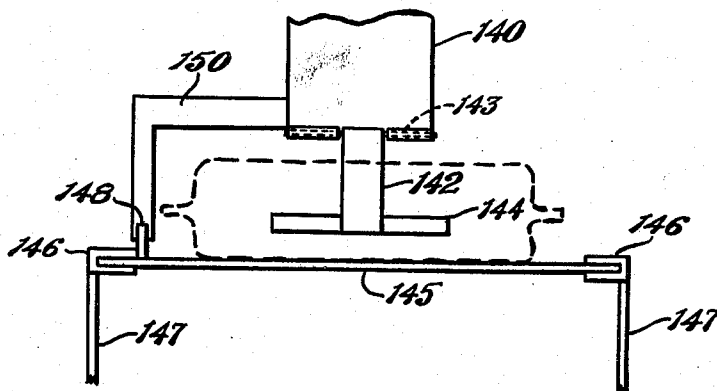


Fig. 5

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2,924,922

APPARATUS FOR USE IN PACKAGING OF PRODUCT

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Continuation of application Serial No. 633,338, January 9, 1957. This application November 26, 1957, Serial No. 699,434

10 Claims. (Cl. 53—96)

This invention relates in general to the vacuum packaging of objects in flexible wrappers and more particularly to an apparatus adapted to vacuumize and seal a plurality of product containing packages in a continuous operation. This application is a continuation of application Serial No. 633,338, filed January 9, 1957, now abandoned.

An important development in packaging technology in recent years is the widespread use of flexible wrapping materials in the formation of hermetically sealed packages. The product to be packaged is placed in a tube of flexible wrapping material or between two sheets of said material, air is exhausted from the area surrounding the product, and the edges of the flexible material are sealed to provide an air-tight package. Machines presently used for packaging products in this manner are unsatisfactory for a number of reasons. Large scale production requires that packages be continuously vacuumized and sealed in rapid succession with a minimum of operator attention. It has been found that if prior art straight-line machines are operated at speeds necessary for economical production however, the resultant packages are unsatisfactory because of insufficient vacuumization or improper sealing or a combination of the two. If, on the other hand, these straight-line machines are operated so as to allow the package to remain in the vacuum chamber for a time sufficient to insure complete air exhaustion, the time interval between packages being vacuumized and sealed is too great for profitable operation.

It is therefore an object of this invention to provide a device adapted to the rapid and continuous production of hermetically sealed packages which retain desirable air-tight characteristics over a substantial period of time.

A further disadvantage of prior art vacuum packaging machines is the great amount of operator attention necessary for efficient operation. An operator must be on duty constantly to introduce unsealed packages to the machine and to remove the sealed package after the vacuumizing and sealing operation.

It is therefore another object of this invention to provide a vacuumizing and sealing apparatus capable of substantially completely automatic operation.

Additional objects, if not specifically set forth herein, will be readily apparent to one skilled in the art from the following detailed description taken in conjunction with the drawings, in which:

Fig. 1 is an end view of an embodiment of the invention with the feeding mechanism removed. The view is taken along the line 1—1 of Fig. 2.

Fig. 2 is a side view taken along line 2—2 of Fig. 1.

Fig. 3 is an enlarged partial segment of the top wall of the cavities illustrating the structure of the pressure plate used therein.

Fig. 4 is a partial section taken at line 4—4 of Fig. 2.

Fig. 5 is an end view taken at line 5—5 of Fig. 2.

The illustrated embodiment is constructed on a frame generally 10. Attached to frame 10 are a pair of bosses

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11 in which is fixedly mounted a hollow shaft 12. One end of shaft 12 is closed while the other end communicates with a vacuum pump 13. Approximately midway between bosses 11, shaft 12 has radial openings 14 through the wall thereof.

Fitting about shaft 12 is a sleeve 16 forming a part of a supporting head generally 17 which in the illustrated embodiment carries four vacuum chambers. The vacuum chambers are all identical in structure and the description of the uppermost vacuum chamber in Figs. 1 and 2 will suffice to illustrate the structure of all of the chambers. This chamber has a bottom wall 18, a top wall 19, and two side walls 20 and 21. The two end openings are closed by means of pivotally mounted doors 22 and 23. Gaskets 24 are used around each end of the chamber to provide a seal between the end of the chamber and the doors 22 and 23. Door 23 is connected to operating arm 27, while door 22 is similarly connected to operating arm 28.

At each side of the vacuum chamber is a sealing means comprising a backing bar 29 and a movable heated sealing bar 30. The heated sealing bar is movable in a vertical direction through upper wall 19 of the chamber and normally is held in the raised position by springs 31 connected between pins 32 and the upper wall 19 of the chamber. The upper end of the sealing bar 30 forms an extending actuating member 33. The actuating members 33 of the sealing bars at each side of the chamber are at opposite sides of the center line of the sealing bars. For example, note that the actuating member 33 in Figs. 1 and 2 is at the rear side of the center line while the actuating member 33' of the sealing bar at the opposite end of the chamber is forward of the center line in Fig. 1. The heating of the sealing bars 30 is accomplished by means of a resistance coil 35 connected by means of wires 37 and 38 to contacts 39 and 40, respectively, which are mounted on sleeve 16 but insulated therefrom. Contact 40 rides on a slip ring 41 while contact 39 rides on a slip ring 42. The slip rings are mounted on pipe 12 but insulated therefrom. Electric power is fed to the slip rings from a suitable source of electricity, not shown.

In the upper wall 19 of the vacuum chamber is a pressure plate 45 to which is attached a pin 46 having a head 47 thereon. A sleeve 48 is journaled in a boss 49 forming a part of the top wall 19 of the chamber. Within sleeve 48 is an opening 50, the upper end of which is of a size to receive head 47 of pin 46 while the lower end of the opening is substantially smaller in diameter than head 47 and of a size to only fit about the body of pin 46. A spring 51 is fitted within the upper end of opening 50 between the top wall thereof (which, of course, is removable to permit the structure to be assembled and disassembled) and the top of head 47. Rotatably mounted on the top of sleeve 48 is a cam follower 52. Sleeve 48 is held in the raised position by a spring 53 positioned between the top of wall 19 and a shoulder 54 at the top of sleeve 48 just below cam follower 52.

A passageway 57 passes through supporting member 17 with one end being in communication with the vacuum chamber and the other end being in communication with an opening 58 through sleeve 16. In the position in which the top vacuum chamber of Figs. 1 and 2 appears, there is no communication between opening 58 and opening 14 in pipe 12. However, these openings are in the same plane so that as the supporting member 17 rotates as hereinafter described, opening 58 will come into communication with opening 14 so as to apply a vacuum to the vacuum chamber through passageway 57. Passageways 59 are formed in the base 18 of the chamber in communication with passageway 57 so as to prevent

the packages in the chamber from obstructing the vacuum drawn through passageway 57.

Supporting head 17 is driven a step at a time by a conventional Geneva drive which is connected so that one of the vacuum chambers will be held in the upper position illustrated by the position of the vacuum chamber just described during each dwell period of the Geneva drive. This drive consists of a driven member 60 attached to sleeve 16. Driven member 60 has a slot 61 for each of the vacuum chambers with arcuate segments 62 intermediate each of slots 61. Driving member 63 is attached to a shaft 64 suitably journaled in bearing 65. Driving member 63 comprises a wheel 67 and an arm 68. Wheel 67 has a cutout 69. Arm 68 has a roller 70 projecting therefrom and adapted to enter slots 61 of driven member 60. As is readily apparent, rollers 70 upon entering a slot 61 rotate driven member 60 through 90°, the rotation being permitted by the cutout 69 in wheel 67. After rotating through 90° the circular periphery of wheel 67 enters arcuate segments 62 to hold the driven member 60 in that position until roller 70 rotates through the remainder of a revolution to enter the next slot 61 in driven member 60. Shaft 64 is rotated by means of a chain 71 passing about a sprocket 72 attached to shaft 64 and also rotating about a sprocket on the output shaft of a suitable source of power, such as a slow speed electric motor, not shown.

About the outside of supporting member 17 and the vacuum chambers is a cylindrical casing 75 forming a part of frame 10. Casing 75 is employed as a mounting for the various cams operating the portions of the vacuum chambers. A cam 76 cooperates with cam follower 52 to move the pressure plate 45 against the packages in the vacuum chamber. Cam 76 is continuous and extends the same distance out except for a recessed portion 77 at the top of the machine. Thus when a vacuum chamber is positioned at the top of the machine the pressure plate 45 is retracted (the position shown in Fig. 3) by cam follower 52 being extended under the urging of spring 53. As the vacuum chambers leave the topmost position and move through the other three positions, cam 76 is contacted by cam follower 52 to push the pressure plate 45 down against the packages in the chamber.

A pair of cams 80 and 81 are positioned at the top of casing 75 to open doors 22 and 23. Cam followers 82 and 83, respectively, contact cams 81 and 80, respectively, to swing the doors open as each vacuum chamber approaches its uppermost position. As that vacuum chamber leaves the uppermost position, cams 80 and 81 cause the doors to close with the doors subsequently being held closed by the application of vacuum to the chambers. The force of gravity acting on doors 22 and 23 assists in the initial closing of the doors.

At the right side of casing 75 in Fig. 1 are a pair of cams 85 and 86 to operate the heated sealing bars 30. Actuating member 33' contacts cam 85 and at the same time actuating member 33 contacts cam 86. In each case the cam pushes the actuating member inwardly to move the heated sealing bars 30 against the ends of the package in the chamber and to press those ends between the heated sealing bar 30 and the backing bar 29.

The structure for moving the packages into the chambers is best illustrated in Figs. 2 and 4. A power slide 90 is journaled in casing 75 for longitudinal movement in said casing. Attached to slide 90 is a depending member 91. A pusher 92 has the upper end cut to a fork configuration (see Fig. 4), with the two tines 93 of the fork being pivotally attached to depending member 91 by a pin 94. The two tines 93 extend beyond pin 94 to contact a stop 95 which limits the clockwise rotation of pusher 92 as seen in Fig. 2.

At one end of slide 90 is secured a headed pin 97 which is received in a slot 98 in the end of an arm 99 (Fig. 1). Arm 99 is attached to a shaft 100 journaled

in a boss 101 forming a part of frame 10. An actuating arm 102 is attached to the opposite end of shaft 100 and carries a cam follower 103 at the end thereof. A cylindrical positive action cam 104 has a cam slot 105 in which is received cam follower 103. Cam 104 is secured to a shaft 106 suitably journaled in bearings 107 and 108. A sprocket 109 is attached to shaft 106 and is driven by a chain 110 from a sprocket 111 on shaft 64.

At the left end of the machine in Fig. 2, the entering end for the packages, is a supporting plate 115 forming a part of frame 10. A downward reverse bend at each side of the plate 115 forms a way 116 for slide 117. At the bottom of one end of slide 117 is a post 118 secured to the slide to engage one end of a spring 119. The opposite end of spring 119 is hooked on a cross bar 120 held by projecting members 121. A cross brace 122 is used to strengthen the reverse bent portions forming ways 116 but positioned far enough forward so as to allow free movement of post 118 between the rearward segments of the reverse bent portions.

Attached to depending member 91 is a cross bar 125 having two arms 126 projecting downwardly therefrom. At the lower end of arms 126 are detents 127 pivotally mounted on pins 128. The forward end of each detent 127 is hooked to engage stops 129 secured to slide 117. Stops 129 project through slots in supporting plate 115. The rearward side of stops 129 are sloped to form a cam surface 130 to permit the detents 127 to ride thereover. Along the outside of detents 127 are cam surfaces 131 which cooperate with fixed cams 132 fixed to the sides of supporting plate 115. A spring 133 is hooked between post 134 on the side of each of arms 126 and the top of each detent 127. Stops 135 limit the clockwise rotation of detents 127 (as viewed in Fig. 2).

The structure for removing the packages from the vacuum chamber is attached to the opposite end of slide 90. A downwardly projecting member 140 is secured to slide 90 and carries a horizontal arm 141. A finger 142 is pivotally attached to arm 141 by means of a pin 143. A pusher plate 144 is attached to the end of finger 142.

A slide 145 is mounted in ways 146 forming a part of brackets 147 secured to frame 10. Secured to slide 145 at one side thereof are a pair of stops 148 and 149. Between stops 148 and 149 is an L-shaped actuating member 150 secured to downwardly projecting member 140.

To operate the described embodiment the vacuum pump 13 is started and a suitable electrical connection is made to the slip rings 41 and 42 to feed resistance coils 35. Partially formed packages of product 155 are positioned on supporting plate 115 in approximately the position shown in Fig. 2. This may be done by hand or by delivery to that point by other apparatus. One substantial advantage of my invention is that the initial positioning of these packages is not critical and the feeding mechanism (not shown) for doing so need not be closely calibrated in that respect.

Preferably these packages have been partially formed with the ends sealed except for a gap 156 in the central portion of the seal. I prefer to have the ends thus partially sealed because the film is thereby held in place, eliminating the possibility of the film at the ends being mispositioned or wrinkled. The aperture 156 may be in either or both ends of the package. The effectiveness of vacuumization of the package will be improved by having the apertures in both ends and the described embodiment is suitable for closing such packages.

When the electric motor or other power source for driving chain 71 is energized, cam 104 commences to rotate and to move cam follower 103 to the left in Fig. 2. This draws slide 90 to the left. As detents 127 come into contact with cams 132, the cams rotate the detents counterclockwise (Fig. 2) so as to disengage the detents from stops 129. Upon that disengagement spring 119 moves slide 117 against the face of supporting head 17

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to form a bridge for the package 155 to enter the uppermost vacuum chamber. With the continued movement of slide 90, pusher 92 contacts the forward end of the package with the pusher thereby pivoting the pusher counterclockwise to pass across the top of package 155. The pusher finally arrives at the dotted line position illustrated at 92' in Fig. 2, with the pusher having fallen behind the package as it passed completely beyond the rear side of the package.

With the foregoing described movement of slide 90, depending member 140 also moved to the left. In doing so actuating member 150 contacted stop 148 to move slide 145 to the left so as to form a bridge at the exit end of the vacuum chamber. At the same time arm 141 entered the vacuum chamber with finger 142 being pivoted counterclockwise as it contacted and passed over the package in the vacuum chamber. Upon passing beyond the rearward side of the package in the vacuum chamber, finger 142 fell behind that package to place pusher 144 at the rear side of the package.

Cam 104 then commences moving slide 90 to the right in Fig. 2. As it moves to the right, pusher 92 pushes package 155 across the bridge formed by slide 117 to cause it to enter into the vacuum chamber. At the same time pusher 144 ejects the package previously in the vacuum chamber from that chamber across the bridge formed by slide 145. As slide 90 approaches the end of its stroke actuating member 150 contacts stop 149 to withdraw slide 145 from the side of supporting head 17. During the same movement of slide 90 detent 127 contacts the cam surface 130 of stop 129 to pivot the detent counterclockwise and permit the detent to pass forwardly of and in a position to engage stop 129. Cam 104 then causes slide 90 to commence moving to the left in Fig. 2, at which time detent 127 engages stop 129 to draw slide 117 away from the side of supporting head 17. Cam 104 then enters a brief dwell period.

During the dwell period of cam 104 the Geneva drive rotates sleeve 16 and supporting head 17 counterclockwise 90° in Fig. 1. As the top vacuum chamber with the new package moves away from the uppermost position of Fig. 1, cams 80 and 81 close doors 22 and 23 to the vacuum chamber. At the same time cam follower 52 is forced downwardly by contact with cam 76 to move the pressure plate 45 against the top of the package. The amount of pressure that will be applied between pressure plate 45 and the bottom 18 of the vacuum chamber is determined by the strength of spring 51. This is achieved by causing cam 76 to move cam follower 52 a distance greater than the distance necessary for the pressure plate 45 to reach the side of the package. The excess travel of cam follower 52 is taken up by the compression of spring 51. As the vacuum chamber approaches the left side position in Fig. 1, opening 58 in sleeve 16 comes into communication with opening 14 in pipe 12. The vacuum pump 13 thereby is caused to evacuate the vacuum chamber through pipe 12, openings 14 and 58, and passageway 57.

The package in the vacuum chamber remains under mechanical compression and under a vacuum, during the period of time that it is in the left-hand position in Fig. 1, the lower position, and the right-hand position. Of course, during this period packages are being removed from, and new packages inserted into, each of the other vacuum chambers as they traverse the top position. As the vacuum chamber leaves the right-hand position in Fig. 1 and approaches the upper position, actuating member 33' contacts cam 85 and actuating member 33 contacts cam 86. During the period of time that these actuating members are traversing their respective cams, the cams push the actuating members down so as to bring the heated sealing bars 30 against the top of the unsealed portion of the ends of the package and to press those portions against backing bar 29. The length of time that this occurs can be varied by varying the length of

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the cams 85 and 86. During this time the heated sealing bars cause the unsealed portions of the thermoplastic film to cohere and form a fluid-tight seal.

As the vacuum chamber continues to move toward the top position the heated sealing bars are released and raised by springs 31. Cam follower 52 enters the recessed portion 77 of cam 76 so as to permit the pressure plate 45 to be raised by the action of spring 53. Also during the same period of movement, opening 58 in sleeve 16 passed the end of opening 14 in pipe 12, thereby cutting off the vacuum to the vacuum chambers. The cams 80 and 81 move arms 28 and 27, respectively, so as to open doors 22 and 23, respectively.

It will be noted that my invention provides a straight line movement into and out of the vacuum chamber. This is important in obtaining rapid operation and also facilitates the proper positioning of the packages in the vacuum chamber. The packages are held in this proper position by pressure plate 45 which at the same time applies mechanical pressure to the exterior of the package to facilitate in removing the air therefrom. Compared to conventional straight line machines the period of vacuumization is about doubled while at the same time nearly doubling the number of vacuum sealed packages produced per minute.

The foregoing description of a specific embodiment is for the purpose of complying with 35 U.S.C. 112 and should not be construed as imposing unnecessary limitations on the appended claims inasmuch as modifications thereof will be readily apparent to those skilled in the art. Examples of such modifications would be a variation in the number of vacuum chambers. One feature of the present invention is the ability to apply a vacuum to an individual package for some time before the actual seal is made, yet the limiting feature on which the speed of operation is determined is the rapidity with which the packages can be inserted into and removed from the open vacuum chamber. If the period of time required for that insertion and removal multiplied by one less than the number of chambers is greater or less than what is needed to achieve adequate evacuation of the packages in the closed chambers before the packages are sealed, the number of chambers may be varied accordingly. In some embodiments it might be desired to use pressure sensitive adhesives to seal the ends of the film rather than thermoplastic films. In such case the heating elements 35 could be eliminated or just not energized, with the movable sealing bar 30 performing the function of producing a seal merely by applying pressure to the unsealed portion of the ends of the film. The size of these components could similarly be varied to accommodate different sized elements or different sized unsealed portions in the ends of the partially formed packages.

I claim:

1. A device for use in sealing an extending end of a plurality of partially formed packages under controlled atmospheric conditions, said device including a frame, a supporting head mounted on said frame for rotation about a generally horizontal axis, said head having a plurality of chambers, each having a package supporting base and three walls about said base with the two ends thereof being open, said base being substantially tangential to a circle of revolution about said axis, power means connected to said head to rotate said head a step at a time from a position at which each chamber, when each chamber is at said position, has the base thereof generally horizontal, means to close said two ends of said chambers except when said chambers are at said position, means to insert a partially formed package in each chamber when each chamber is at said position and to remove the finished package from that chamber, means to adjust the atmosphere in said chambers after said chambers leave said position, and means to seal said ends of the packages in each chamber after the atmosphere in each chamber has

been adjusted and before the chamber returns to said position.

2. A device for use in sealing an extending end of a plurality of partially formed packages under controlled atmospheric conditions, said device including a frame, a supporting head mounted on said frame for rotation about a generally horizontal axis, said head having a plurality of chambers, each having a package supporting base and three walls about said base with the two ends thereof being open, said base being substantially tangential to a circle of revolution about said axis, power means connected to said head to rotate said head a step at a time from a position at which each chamber, when each chamber is at said position, has the base thereof generally horizontal, means to close said two ends of said chambers except when said chambers are at said position, means to insert a partially formed package in each chamber when each chamber is at said position and to remove the finished package from that chamber, means to adjust the atmosphere in said chambers after said chambers leave said position, a pressure plate in each chamber normally positioned adjacent the wall opposite said base, means operatively connected to said plates to move each plate towards its respective base after the respective chamber leaves said position so as to apply pressure to the package between said plate and said base and to return said plate to said normal position before the respective chamber returns to said position and said package is removed, and means to seal said ends of the packages in each chamber after the atmosphere in each chamber has been adjusted and before the chamber returns to said position.

3. A device for use in sealing an extending end of a plurality of partially formed packages under controlled atmospheric conditions, said device including a frame, a supporting head mounted on said frame for rotation about a generally horizontal axis, said head having a plurality of chambers, each having a package supporting base and three walls about said base with the two ends thereof being open, said base being substantially tangential to a circle of revolution about said axis, power means connected to said head to rotate said head a step at a time from a position at which each chamber, when each chamber is at said position, has the base thereof generally horizontal, means to close said two ends of said chambers except when said chambers are at said position, means to insert a partially formed package in each chamber when each chamber is at said position and to remove the finished package from that chamber, means to adjust the atmosphere in said chambers after said chambers leave said position, and means to seal said ends of the packages in each chamber after the atmosphere in each chamber has been adjusted and before the chamber returns to said position, said last mentioned means comprising a packing bar member and a heated sealing member, one of said members being positioned at a fixed elevation with respect to said base, and actuating means operatively connected to the other of said members to move said other member toward and away from said one member.

4. A device for use in sealing an extending end of a plurality of partially formed packages under controlled atmospheric conditions, said device including a stationary hollow shaft mounted with the longitudinal axis thereof substantially horizontal; a supporting head mounted for rotation about said axis, said head having a plurality of chambers, and a sleeve about said shaft, said sleeve having a plurality of radial openings therein with one opening for each of said chambers and in communication with the respective chamber, each of said chambers having a package supporting base and three walls about said base with the two ends thereof being open, said base being substantially tangential to a circle of revolution about said axis, power means connected to said head to rotate said head a step at a time from a position at which each chamber, when each chamber is at said position, has the

base thereof generally horizontal, means to close said two ends of said chambers except when said chambers are at said position, means to insert a partially formed package in each chamber when each chamber is at said position and to remove the finished package from that chamber, said shaft having an opening therein positioned in the same plane as said radial openings in said sleeve, said shaft opening being positioned to be in alignment with the radial opening for each chamber only after said chamber leaves said position and before it returns to said position, and means communicating with the hollow interior of said shaft to control the atmospheric conditions therein and in the chambers in communication therewith.

5. A device for use in sealing an extending end of a plurality of partially formed packages under controlled atmospheric conditions, said device including a frame, a supporting head mounted on said frame for rotation about a generally horizontal axis, said head having a plurality of chambers, each having a package supporting base and three walls about said base with the two ends thereof being open, said base being substantially tangential to a circle of revolution about said axis, power means connected to said head to rotate said head a step at a time from a position at which each member, when each chamber is at said position, has the base thereof generally horizontal, means to close said two ends of said chambers except when said chambers are at said position, said last mentioned means comprising a door for each end of each of said chambers, said door movable between an open position and a closed position, means urging said doors toward one of said positions, a cam about at least a side of said axis, cam followers operatively connected to said doors and positioned to contact said cam to move said doors to said other position, means to insert a partially formed package in each chamber when each chamber is at said position through one end of said chamber and to remove the finished package from that chamber through the opposite end of said chamber, means to adjust the atmosphere in said chambers after said chambers leave said position, and means to seal said ends of the packages in each chamber after the atmosphere in each chamber has been adjusted and before the chamber returns to said position.

6. A device for use in sealing an extending end of a plurality of partially formed packages under controlled atmospheric conditions, said device including a frame, a supporting head mounted on said frame for rotation about a generally horizontal axis, said head having a plurality of chambers, each having a package supporting base and three walls about said base with the two ends thereof being open, said base being substantially tangential to a circle of revolution about said axis, power means connected to said head to rotate said head a step at a time from a position at which each chamber, when each chamber is at said position, has the base thereof generally horizontal, means to close said two ends of said chambers except when said chambers are at said position, said last mentioned means comprising a door for each end of each of said chambers and movable between an open position and a closed position, means urging said doors toward one of said positions, a cam about at least a side of said axis, cam followers operatively connected to said doors and positioned to contact said cam to move said doors to said other position, means to insert a partially formed package in each chamber when each chamber is at said position through one end of said chamber and to remove the finished package from that chamber through the opposite end of said chamber, means to adjust the atmosphere in said chambers after said chambers leave said position, a pressure plate in each chamber movable toward and away from said base, resilient means urging said plate in one direction with respect to said base, a second cam about said axis, a cam follower operatively connected to said plate and contacting said second cam, said urging means and said

cam being constructed and arranged to apply pressure to the package in each said chamber after each said chamber leaves said position and to withdraw said pressure before each said chamber returns to said position, and means to seal said ends of the packages in each chamber after the atmosphere in each chamber has been adjusted and before the chamber returns to said position.

7. A device for use in sealing an extending end of a plurality of partially formed packages under controlled atmospheric conditions, said device including a frame, a supporting head mounted on said frame for rotation about a generally horizontal axis, said head having a plurality of chambers, each having a package supporting base and three walls about said base with the two ends thereof being open, said base being substantially tangential to a circle of revolution about said axis, power means connected to said head to rotate said head a step at a time from a position at which each chamber, when each chamber is at said position, has the base thereof generally horizontal, means to close said two ends of said chambers except when said chambers are at said position, means to insert a partially formed package in each chamber when each chamber is at said position and to remove the finished package from that chamber, said last mentioned means including a pusher movable toward and away from the chamber at said position to insert a package into the chamber, and a finger movable into and out of said chamber, said finger being pivotally mounted whereby it will pass over the package to fall behind the rearward end thereof to withdraw the package as the finger moves out of the chamber, means to adjust the atmosphere in said chambers after said chambers leave said position, and means to seal said ends of the packages in each chamber after the atmosphere in each chamber has been adjusted and before the chamber returns to said position.

8. A device for use in sealing partially formed packages under controlled atmospheric conditions, said device including a frame, a supporting head mounted on said frame for rotation about a generally horizontal axis, said head having a plurality of chambers, each having a package supporting base and two opposing open ends adjacent said base, said base being substantially tangential to a circle of revolution about said axis, power means connected to rotate said head, means to close said two ends of said chambers during a major portion of the rotation of said head, said last mentioned means comprising a door for each end of each of said chambers, said doors being movable between an open position and a closed position, means urging said doors toward one of said positions, a cam about at least a

side of said axis, cam followers operatively connected to said doors and positioned to contact said cam to move said doors to said other position, means to adjust the atmosphere in said chambers after said ends are closed, and means to seal said packages in said chambers after the atmosphere in said chambers has been adjusted and while the ends of said chambers remain closed.

9. A device for use in subjecting packages to a controlled atmosphere, said device including a frame, a supporting head mounted on said frame for rotation about a generally horizontal axis, said head having a plurality of chambers, each having a package supporting base and two opposing open ends adjacent said base, said base being substantially tangential to a circle of revolution about said axis, power means connected to rotate said head, means to close said two ends of said chambers during a major portion of the rotation of said head, said last mentioned means comprising a door for each end of each of said chambers, said doors being movable between an open position and a closed position, means urging said doors toward one of said positions, a cam about at least a side of said axis, cam followers operatively connected to said doors and positioned to contact said cam to move said doors to said other position, and means to control the atmosphere in said chambers while said ends are closed.

10. A device for use in sealing packages, said device including a frame, a supporting head mounted on said frame for rotation about a generally horizontal axis, said head having a plurality of chambers, each having a package supporting base and two opposing open ends adjacent said base, said base being substantially tangential to a circle of revolution about said axis, power means connected to rotate said head, means to close said two ends of said chambers during a major portion of the rotation of said head, said last mentioned means comprising a door for each end of each of said chambers, said doors being movable between an open position and a closed position, means urging said doors toward one of said positions, a cam about at least a side of said axis, cam followers operatively connected to said doors and positioned to contact said cam to move said doors to said other position, and means to seal said packages in said chambers while said ends are closed.

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