Nov. 18, 1969 H. A. JENSEN ET AL 3,478,488

PACKAGING MACHINE

Filed March 27, 1967 6 Sheets-Sheet 1

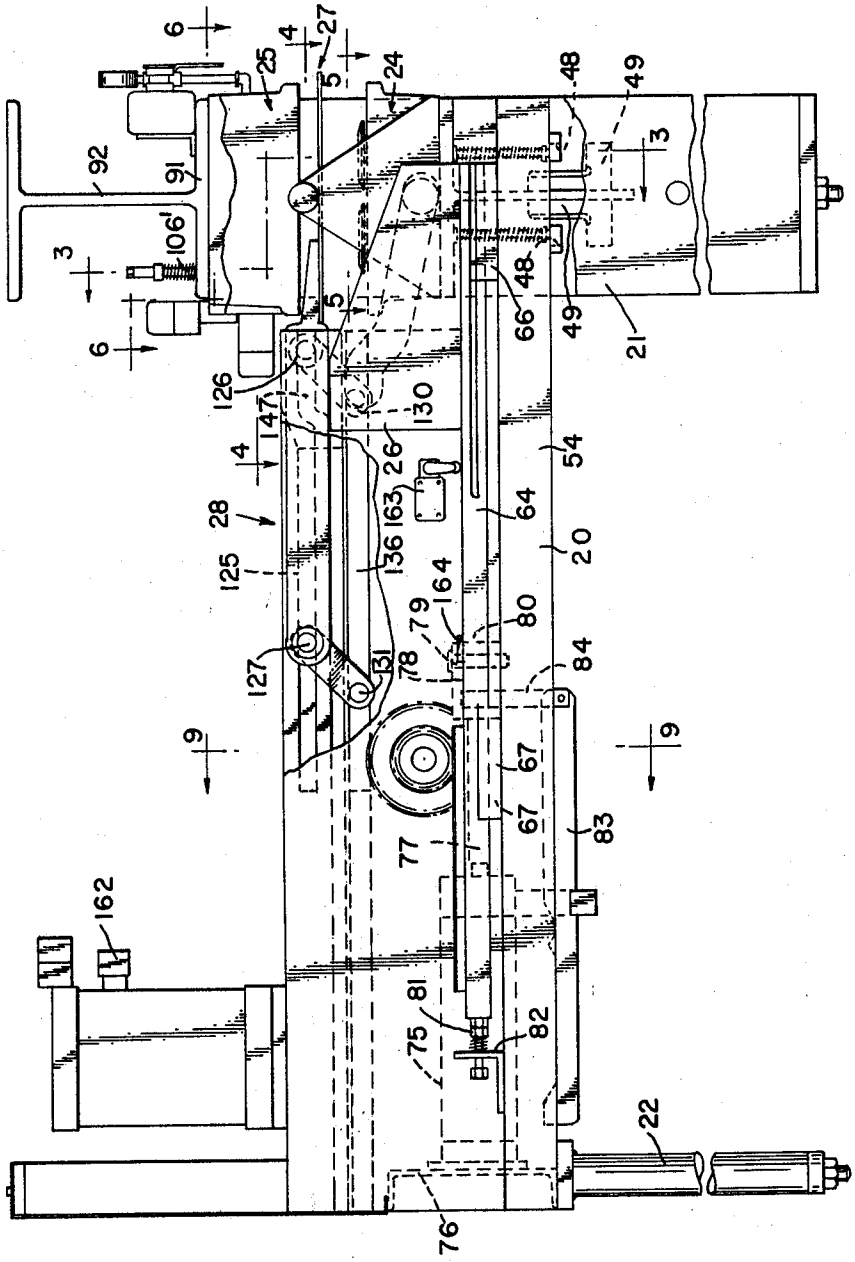


FIG. 1

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PACKAGING MACHINE

Filed March 27, 1967 6 Sheets-Sheet 2

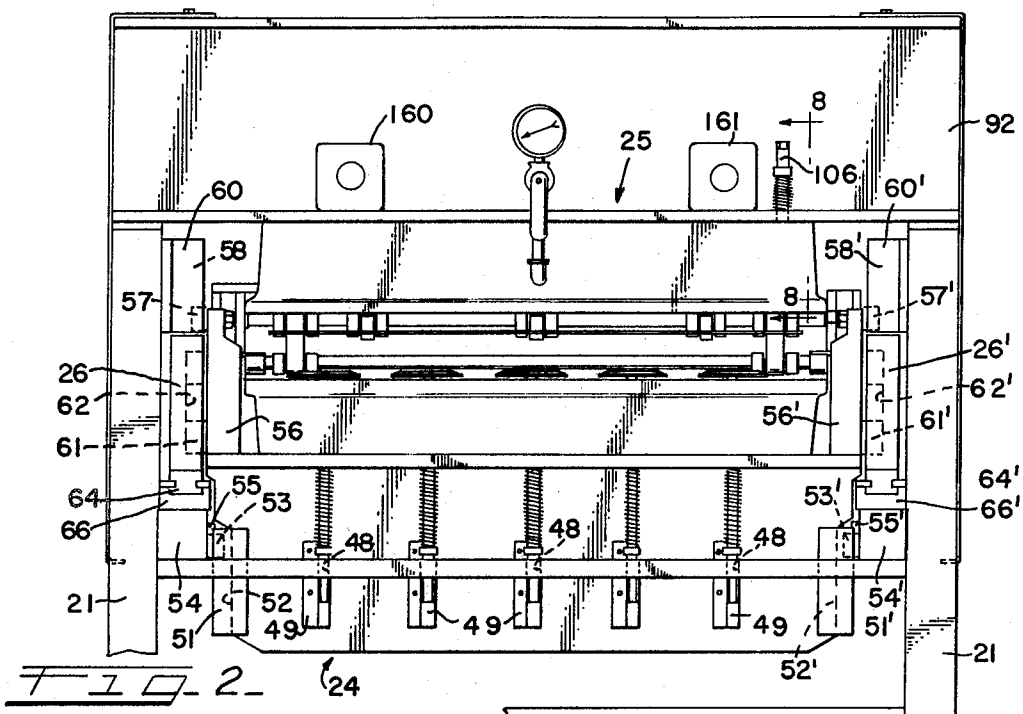


FIG. 2

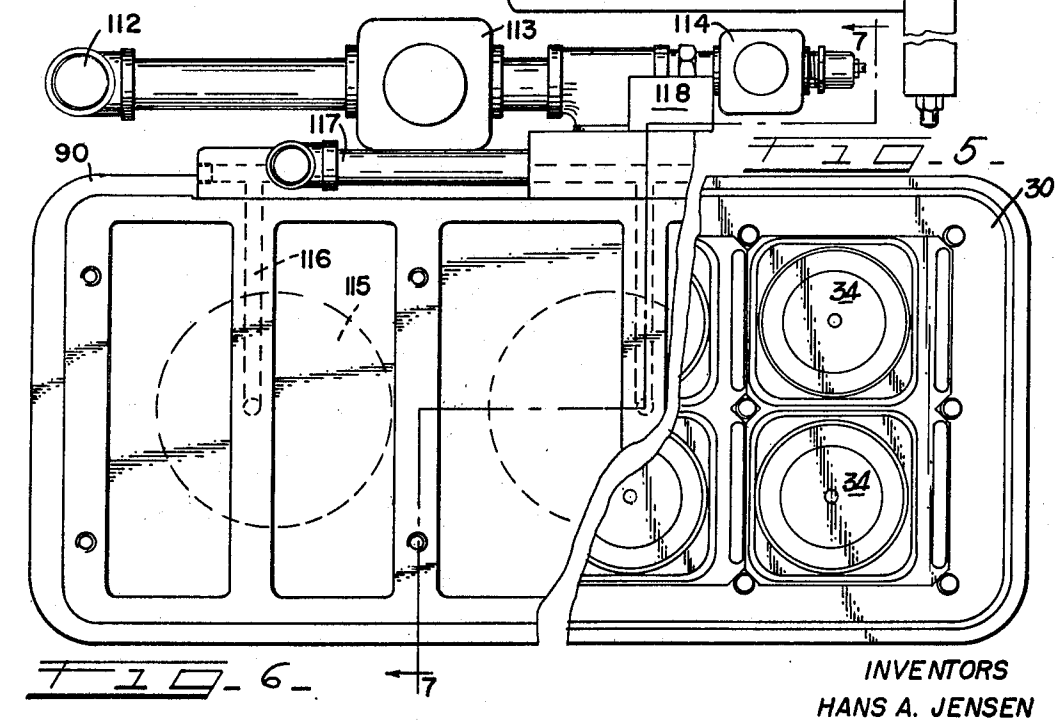


FIG. 5

FIG. 6

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PACKAGING MACHINE

Filed March 27, 1967 6 Sheets-Sheet 3

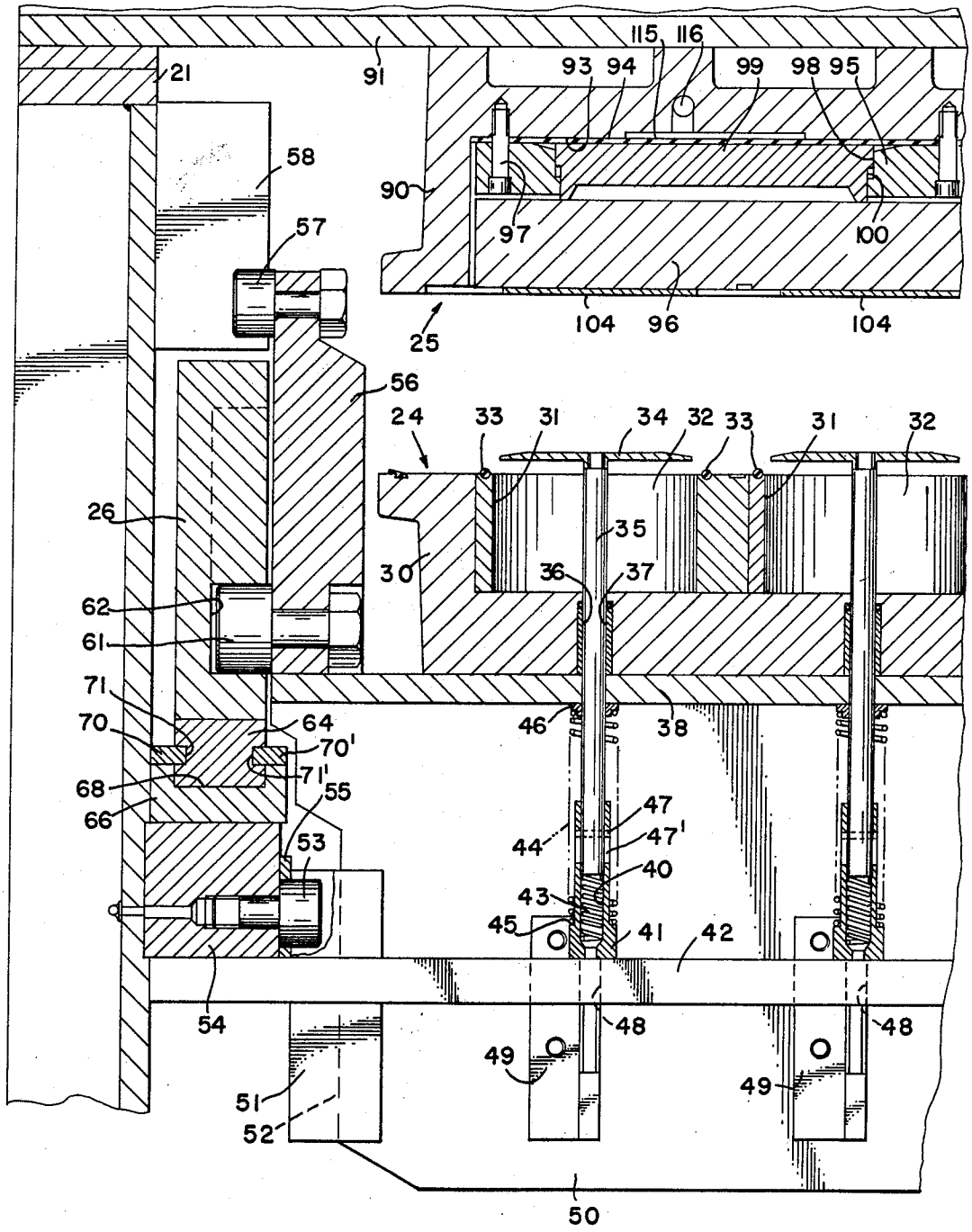


FIG. 3.

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PACKAGING MACHINE

Filed March 27, 1967 6 Sheets-Sheet 4

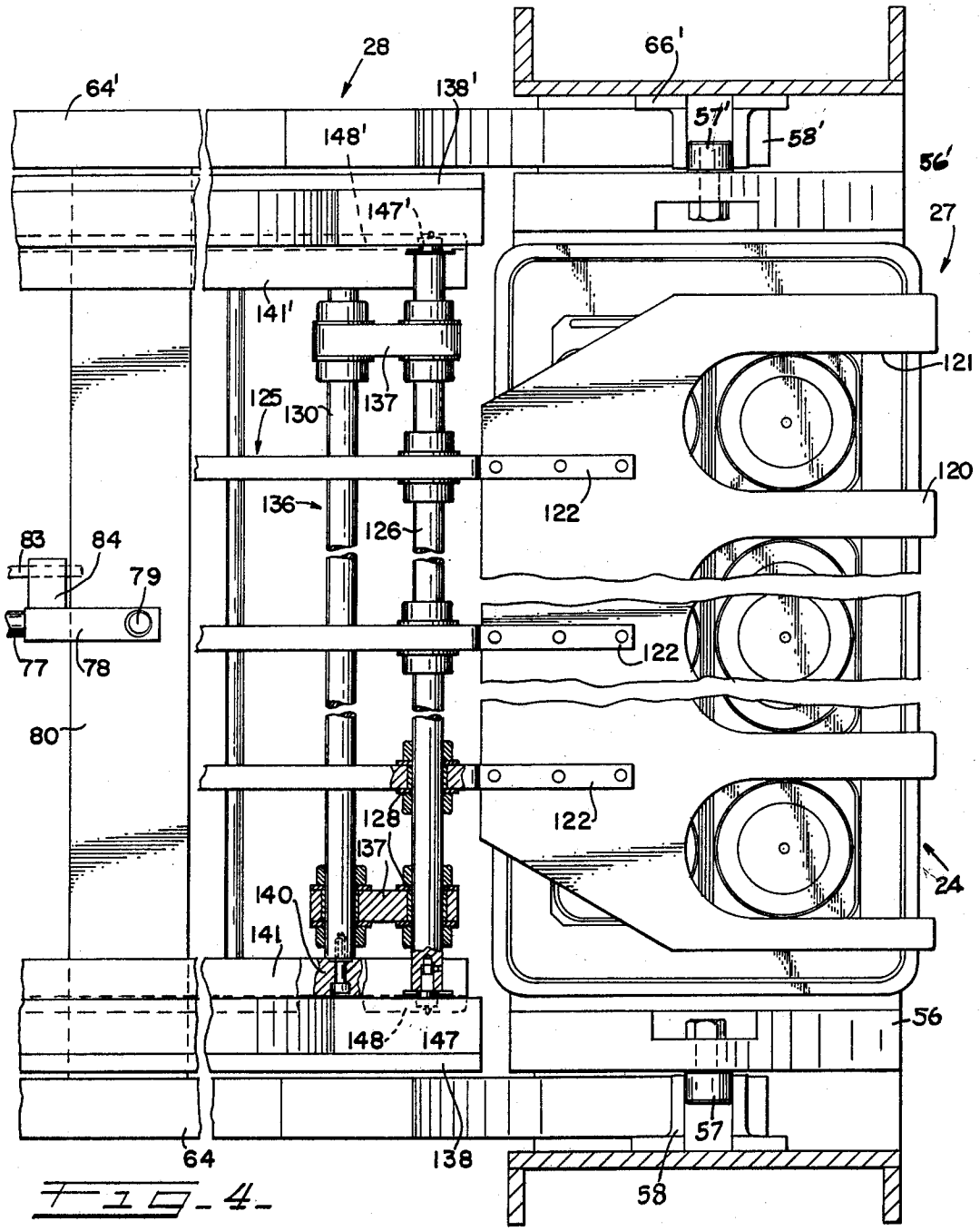


FIG. 4

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PACKAGING MACHINE

Filed March 27, 1967 6 Sheets-Sheet 5

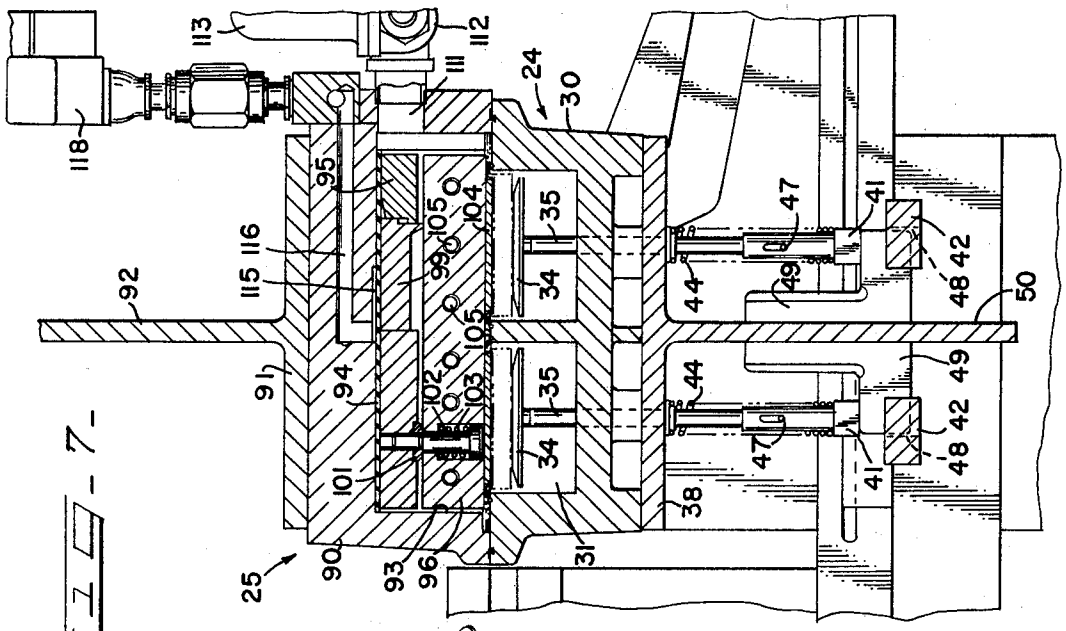


FIG. 7

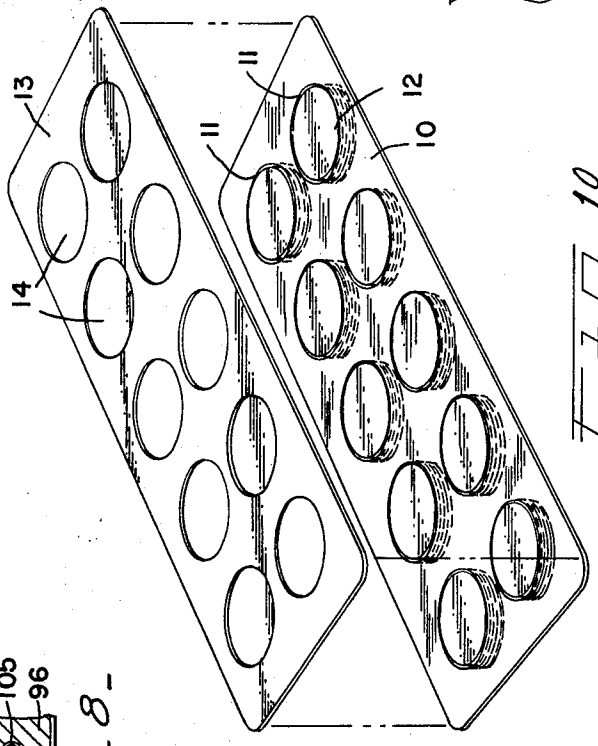


FIG. 10

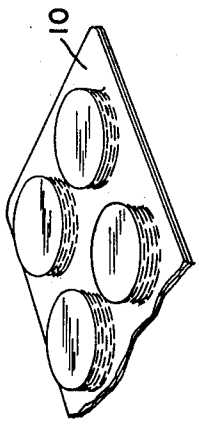


FIG. 11

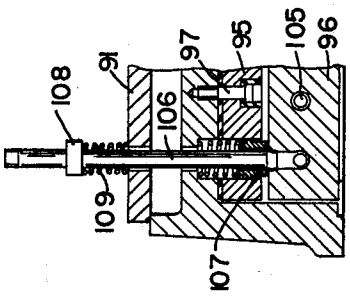


FIG. 8

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PACKAGING MACHINE

Filed March 27, 1967 6 Sheets-Sheet 6

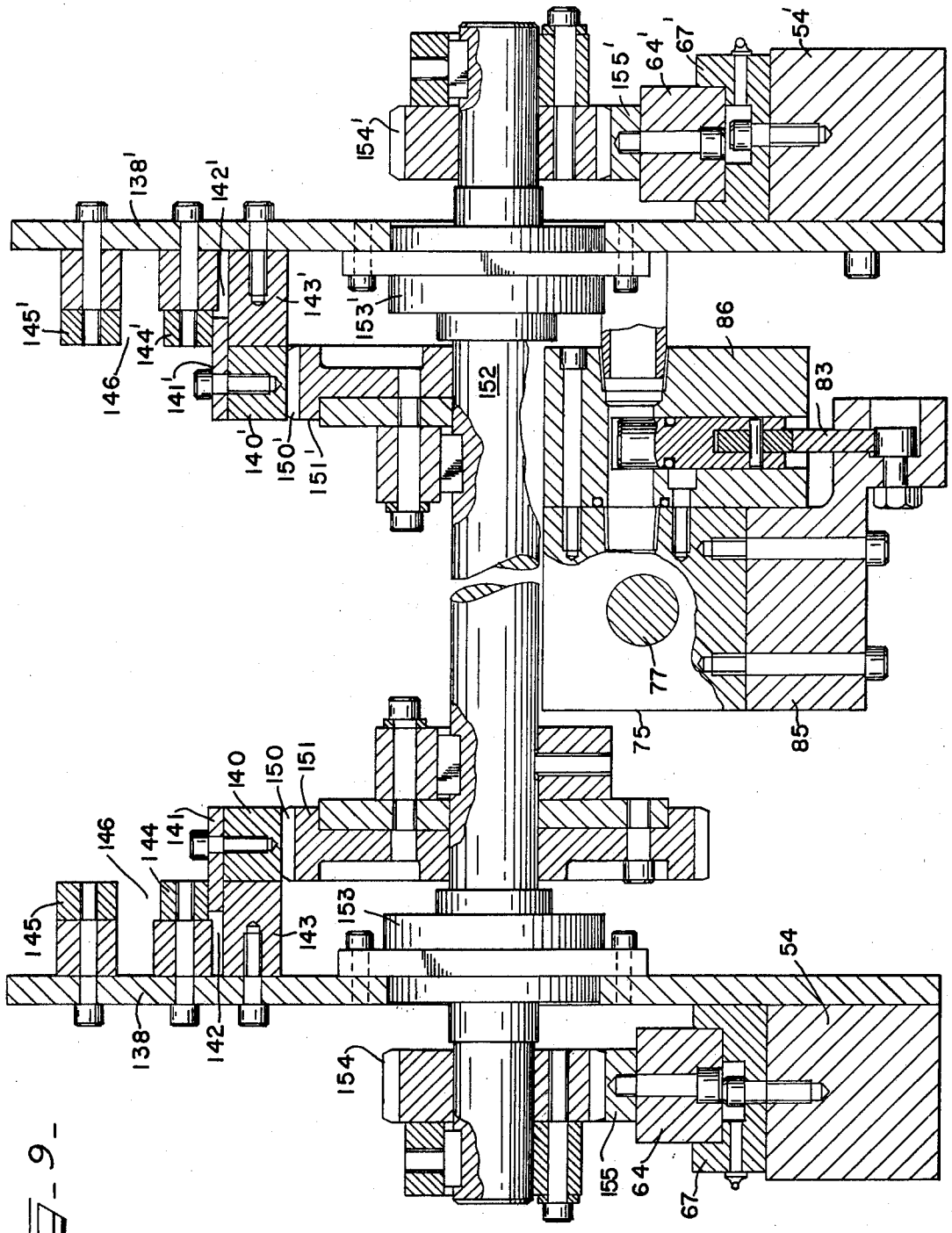


FIG. 9

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United States Patent Office 3,478,488 Patented Nov. 18, 1969

3,478,488

PACKAGING MACHINE

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Filed Mar. 27, 1967, Ser. No. 626,297
Int. Cl. B65b 31/02, 51/14
U.S. Cl. 53—112 15 Claims

ABSTRACT OF THE DISCLOSURE

An apparatus for vacuumizing and pressure sealing an assembly of package elements which is characterized by vertically aligned, relatively movable lower and upper vacuum chamber and sealing die members between which the package elements are clamped and associated mechanism for evacuating a plurality of compartments in the lower member when a series of connected product-receiving package forms are seated therein and the die members are closed, and for sealing portions of the package forms which are trapped between the dies while pressure is applied to opposite faces of the product enclosing portions so as to compress the product and fill the product accommodating space within the packages.

This invention relates to packaging and is concerned with improvements in an apparatus for vacuumizing and pressure sealing, while under vacuum and in a compressed state, a plurality of connected package assemblies of the type which are characterized by a preformed, cup-shaped body of semi-rigid plastic which encompasses the product and a rigid or semi-rigid panel-like closure member forming the bottom of the package and supporting the product therein, with the body and closure members having telescoping portions and marginal flange portions which are superimposed and heat sealed.

A package which is especially designed for marketing sliced luncheon meat and similar products has been developed which comprises a preformed tray or cup-shaped, transparent plastic container body for encompassing a predetermined quantity of the product in snug relation and a closure member of rigid or semi-rigid plastic having a product supporting panel or raised platform like portion which telescopes within the container body and a flange surrounding the product supporting panel which is adapted to be sealed to an overlying flange on the margins of the container body with the package being vacuumized and heat sealed while pressure is applied on the top and bottom faces so as to compress the product and substantially fill the space within the package and provide a unitary package assembly. In producing this type package it has been found convenient to shape a plurality of the package elements in connected relation from plastic sheet materials, fill the container body forming elements with the desired amount of product, for example, one-half pound or a pound of sliced luncheon meat in each of the body forming cavities, assemble the cover forming elements therewith and subject the assembly to a vacuum while applying pressure to the opposite faces of the assembly and while heat and pressure sealing the flange forming portions surrounding each of the product filled cavities, thereby to produce a plurality of the packages in connected relation. The sealed assembly is thereafter trimmed or cut apart so as to provide the separate individual packages. The general object of the present invention is to provide an apparatus of a semi-automatic nature which will accept the aforesaid package assemblies and accomplish the closing and sealing operations while the assemblies are vacuumized and pressure is applied to the oppositely disposed top and bottom faces of each of the packages in the assemblies.

It is a more specific object of the invention to provide an apparatus for closing and sealing a plurality of connected package units which are initially formed by shaping sheet material so as to provide a series of connected product-receiving cavities in one sheet and a series of connected closure panels in another sheet having portions which telescope within the cavities wherein the apparatus comprises a compartment vacuum chamber or die member and a cooperating pressure die member mounted for relative movement toward and from each other in a vertical path with cam means for opening and closing the dies upon the package assembly and associated mechanism for applying vacuum to the package units before they are sealed and for heat sealing around the margins of each package unit while pressure is applied to the top and bottom faces thereof so as to compress the product and cause the same to conform to the interior of and to fill the space within each package unit.

It is a further object to provide an apparatus of the type described which is semi-automatic and requires only that the package assemblies be placed on a loading plate which is thereafter operative to deposit the assemblies in the proper relation between the closing and sealing dies and to return the same when closed and sealed to a position for ready removal from the machine.

These and other objects and advantages of the invention will be apparent from a consideration of the apparatus for closing and sealing multi-unit package assemblies which is shown by way of illustration in the accompanying drawings wherein:

FIGURE 1 is a side elevation of a machine which incorporates therein the principal features of the invention, with portions thereof being broken away;

FIGURE 2 is an elevation of the front or loading and discharge end of the machine, with portions thereof being broken away;

FIGURE 3 is a partial cross section taken on the line 3—3 of FIGURE 1, to a larger scale and with the dies being in the open position;

FIGURE 4 is a sectional view taken on the line 4—4 of FIGURE 1, to an enlarged scale;

FIGURE 5 is a partial section taken on the line 5—5 of FIGURE 1, to an enlarged scale;

FIGURE 6 is a fragmentary section taken on the line 6—6 of FIGURE 1, to an enlarged scale;

FIGURE 7 is a partial cross section taken on the line 7—7 of FIGURE 6, to a larger scale and with the dies in the closed position;

FIGURE 8 is a fragmentary section taken on the line 8—8 of FIGURE 2, to an enlarged scale;

FIGURE 9 is a cross section taken on the line 9—9 of FIGURE 1, to an enlarged scale and with portions broken away;

FIGURE 10 is an exploded perspective view showing, in the inverted position in which they are placed in the machine, package elements which are adapted to be closed and sealed in the machine; and

FIGURE 11 is a perspective view showing a portion of the closed and sealed package assembly, the assembly being shown with the packages in the upright position.

Referring first to FIGURES 10 and 11 of the drawings, the package elements, which are adapted to be closed and sealed by the machine which is illustrated, comprises a sheet **10** of transparent plastic of a semi-rigid character which is preformed to provide a series of connected container bodies constituting product accommodating cavities **11** in each of which a quantity of a product **12** is adapted to be placed with the sheet **10** being inverted so that the cavities **11** are open side up, and a complementary closure sheet **13** formed with a series of depressed panels **14** which are spaced according

to the spacing of the cavities **11** and are adapted to telescope within the open sides of the cavities **11** when the sheet **13** is placed on the sheet **10** and pressure is applied to the opposite faces thereof. When the cavities **11** are filled with the desired amount of the product **12** and the sheet **13** is placed thereon the assembly is positioned in the machine for vacuumizing, compressing and sealing operations so as to produce the multi-unit package assembly shown in FIGURE 11.

The machine comprises an upright supporting frame having a horizontally disposed, generally rectangular main frame portion **20** (FIGURES 1 and 2) supported at the front end by pedestal forming side frame members **21** and at the rear end by depending legs **22**. The side frame members **21** support at the front end of the machine a lower die or vacuum chamber assembly **24** and a vertically aligned upper die or pressure applying and heat sealing assembly **25**. The upper die assembly **25** is in a fixed position while the lower die assembly **24** is mounted for vertical movement and controlled by a pair of cam plates **26** and **26'** mounted for horizontal sliding movement on the main frame **20**. A loading and discharge plate assembly **27** is mounted for movement in a path extending between the two die assemblies **24** and **25** on a horizontally disposed frame **28** which is supported and guided on the main support frame **20** for horizontal reciprocation.

The lowermost vacuum chamber or die assembly **24** comprises an upwardly opening, tray-like member **30** (FIGURES 3 to 7) in which there are mounted a series of inserts **31** each forming an upwardly opening, package receiving compartment or cavity **32** which is of a size to receive the container body or cavity forming portions **11** of the preformed sheet **10**. In the form illustrated the container bodies are of cylindrical shape. Each insert **31** is provided on its uppermost face with a gasket **33** of resilient seal forming material surrounding the edge of the compartment **32**. A pressure applying plate **34** is mounted for movement in each compartment **32** on a stem **35** which is slidable in a sleeve **36** seated in an air sealed bore **37** which extends through the bottom of the die member **30** in the center of each compartment **32**. The stem **35** also extends through a bore in a supporting cross plate **38** on which the member **30** is mounted and into a socket forming bore **40** in a member **41** upstanding from a fixed cross plate or bar **42**. A compression spring **43** is seated in the bore **40** and urges the stem **35** in an upward direction. A larger compression spring **44** is seated at its lower end on a shoulder **45** of member **41** and at its upper end on a shouldered washer **46** beneath the plate **38**. The spring **44** exerts a downward force on the stem **35** and operates to restrain the stem **35** and plate **34** against following the entire die assembly **24** in the upward movement thereof. The movement of the stem **35** relative to member **41** is limited by a pin **47** operating in a slot **47'** in the wall of member **41**. The cross bars **42** (FIGURES 1–3 and 7) are slotted at **48** beneath each member **41** so as to permit the members **41** to be lifted above the bars **42** by stop forming brackets **49** mounted on the depending plate **50** of the die assembly **24**. As the stops **49** move upwardly with the assembly **24** they pass through slots **48** in the bars **42** and lift the members **41** off of bars **42**. The contact of stops **49** with the members **41** determines the full travel of the stems **35** and the plates **34**. The position of the stems **35** and plates **34** relative to the cavities **32** is not affected by any further upward movement of the stops **49**.

The plate **38** on which the die assembly **24** is carried forms the top of a T-shaped member having a depending flange or web **50**. Track forming members **51** and **51'** are mounted at opposite ends of the depending web **50** which provide vertically extending lower guideways **52** and **52'** for receiving guide rollers **53** and **53'** which are journaled in end portions of side frame members **54** and **54'**, the latter being connected to the inside faces of the frame members **21**. Wear plates **55** and **55'** are mounted on the guide rollers **53** and **53'** against which the outermost vertical edges of track members **51** and **51'** bear so as to hold the assembly in a vertical path with substantially no endwise movement. Triangular-shaped end plates **56** and **56'** are upstanding on the ends of the cross plate **38** and carry guide rollers **57** and **57'** at the apex forming tops thereof which are received in vertical guideways **58** and **58'** provided by track forming members **60** and **60'** mounted on the frame members **21**. The guideways **58** and **58'** are in vertical alignment with the guideways **52** and **52'** so as to insure proper vertical movement of the assembly **24**.

The end plates **56** and **56'** carry at the center of their base portion cam rollers **61** and **61'** (FIGURES 1–3) which are operative in cam tracks **62** and **62'** in the oppositely disposed faces of vertically disposed cam plates **26** and **26'**. The cam plates **26** and **26'** extend upwardly of elongate slide members **64** and **64'** which are mounted for horizontal reciprocation in pairs of track formations **66**, **67** and **66'**, **67'** which are spaced longitudinally of the horizontal frame **20** and supported on the top faces of side frame members **54** and **54'**. Each track formation has an upwardly opening, track forming recess **68** (FIGURE 3) which slidingly receives the slide member **64** or **64'** and retaining gibs **70** and **70'** which are received in longitudinally extending slots **71** and **71'** in the side faces of the slide members **64** and **64'**. The slide members **64** and **64'** are reciprocated by operation of the hydraulic cylinder **75** (FIGURE 1) which is mounted on a cross frame channel member **76** at the rear end of the frame **20**. The cylinder **75** extends toward the front of the machine with the piston **77** connected by clevis **78** and pin **79** (FIGURES 1 and 4) to a cross plate member **80** connecting the slide members **64** and **64'**. Spring backed bumpers **81** are mounted on angle brackets **82** on the side frame members **54** and **54'** to act as a cushion stop for the slide members **64** and **64'**. A cam plate **83** is suspended at its forward end from the clevis **78** by a depending bracket **84** and rides in a guide bracket **85** on the bottom of cylinder **75** for operating a valve assembly **86** which is mounted at the inner end of the cylinder **75** and which controls the flow of fluid to the cylinder **75** and thus varies the movement of piston **77**. The piston movement is varied so that the package assembly is placed in the cavities more gently. A more gradual accelerated start of travel is obtained and a more gradual deaccelerated end of travel.

The upper die or chamber assembly **25** (FIGURES 3, 6, 7 and 8) comprises a downwardly opening, tray-like base member **90** which is secured on the bottom face of the lawer flange **91** of a cross I beam **92** forming the top frame member at the front of the machine and being connected at opposite ends to the vertical frame members **21**. The downwardly facing recess **93** in the base member **90** houses a diaphragm **94**, a piston and guide plate assembly **95** and a heat and pressure platen **96**. The diaphragm **94** is in the bottom of the recess **93** and is clamped therein by the guide plate **95** which is secured to the base member **90** by bolts **97**. The guide plate **95** is recessed at **98** to slidingly receive, for limited downward movement, a series of piston members **99**. The pistons **99** are mounted as shown in FIGURE 3 with interengaging shoulders **100** permitting a limited movement in the guide recesses **98**. The lower faces of the piston members **99** bear against the upper face of the platen **96**. The platen **96** is suspended from the guide plate **95** by a plurality of shouldered screws **101** which have their shank ends threaded into suitable bores in the guide plate **95** and extend downward through bores **102** in the platen **96** with the head portions movable in bottom portions of the bores which are of larger diameter and in which a compression spring **103** is trapped so as to normally hold the platen **96** in retracted or elevated position as shown in FIGURE 3. Pads **104** are mounted on the lower face of the platen **96** which are in align-

ment with the recesses **32** in the lower die assembly **24**. The platen **96** is provided with a series of tubular passageways **105** which are connected at one end of the platen to the lower ends of vertically disposed conduits **106** and **106'** (FIGURE 8), each of which extends upwardly through a spring pressed seal assembly indicated at **107** so as to permit the conduits **106** and **106'** to move vertically with the movement of the platens **96**. The conduits **106** and **106'** extend through apertures in the bottom flange **91** of the I beam **92** and carry collars **108** and compression springs **109**. The conduits **106** and **106'** are connected with a suitable steam supply which is circulated through the platen **96** to heat the same. An opening **111** (FIGURE 7) in the side wall of the base member **90** is connected by suitable conduit to a vacuum line indicated at **112** and controlled by valves **113** and **114**. Passageways indicated at **115** and **116** in member **90** (FIGURES 3, 6 and 7) are connected by means of suitable conduits **117** and control valve **118** to an air pressure line and an exhaust line so that pressure may be applied through the diaphragm **94** to the pistons **99** to force the heated platen **96** downwardly against the action of the springs **103** and into pressure applying engagement with the package closure panels when the lower die assembly **24** is raised into engagement with the upper die assembly **25** and vacuum has been applied to the interior of the dies to exhaust the air from the package units.

The loading and unloading apparatus **27** which is provided for positioning the package assembly between the upper and lower die members **25** and **24** so that the package body forming elements **11** are seated in the recesses **32** in the lower die assembly **24** and for removing the sealed assembly after the sealing operation and separation of the die assemblies **24** and **25** is shown in FIGURES 1, 2, 4 and 7. The apparatus **27** comprises a horizontally disposed loading plate **120** with recesses **121** cut in the forward margin to accommodate the container body elements **11** when the package assembly is placed thereon. The fork-like loading plate **120** is secured at its rearward margins to longitudinally extending, parallel bars **122** constituting part of a horizontally disposed top frame **125**. The frame **125** includes parallel, transversely extending rod or bar members **126** and **127** which are rotatably mounted in bushings **128** spaced axially of the cross bars **126** and **127** and mounted in the longitudinal bars **122**. The cross bars **126** and **127** are pivotally connected at their ends with the cross bars **130** and **131** of a lower frame **136** by means of short parallel link bars **137**. The bottom frame **136** is mounted for horizontal sliding movement between vertically extending, parallel side plates **138** and **138'** (FIGURE 9) which are upstanding from the side frame bars **54** and **54'**. The cross bars **130** and **131** are connected at their opposite ends to side rail members **140** and **140'** which carry on their upper faces longitudinally extending gib plates **141** and **141'**, the outer margins of which overhang the outer face of the bars **140** and **140'** and are received in sliding relation in longitudinal guideway **142** and **142'** formed between longitudinally extending bars **143**, **144** and **143'**, **144'** which are secured on the oppositely disposed inside faces of the vertical frame plates **138** and **138'**. Longitudinal guide rails **145** and **145'** are spaced above the guide rails **144** and **144'** so as to form a cam track **146** and **146'** for receiving cam rollers **147** and **147'** on the extended ends of the front cross bar **126** of the top frame **125**. Each of the cam tracks **146** and **146'** has a forward portion **148**, **148'** which is elevated so as to raise the loading plate **120** as it is moved forwardly to extend the same for receiving the package assembly and to lower the plate **120** as it is moved rearwardly of the machine to deposit the package assembly on the lower die assembly **24**. The side rails **140** and **140'** are provided with rack teeth **150** and **150'** on their bottom faces which engage with gears **151** and **151'** mounted on a cross shaft **152** which is journaled in bearings **153** and **153'** supported on the vertical plates **138** and **138'**. The shaft **152** extends through the plates **138** and **138'** and carries pinions **154** and **154'** which engage with racks **155** and **155'** mounted on the tops of the slide members **64** and **64'** which carry the cam plates for raising and lowering the lower die assembly **24**.

The operation of the apparatus is controlled by suitable electric circuitry which includes solenoid controlled electronic timers and solenoid operated air valves. Two starting switches **160** and **161** are arranged at the front of the machine and connected into the control circuit so that these two switches must both be held simultaneously by the operator until the lower die assembly **24** is raised into closed relation with the upper die assembly **25**. The switches are spaced so that both hands are required for operation so as to safeguard the operator. Closing of the two switches **160** and **161** operates solenoid air valve indicated at **162** which connects the air supply line to the hydraulic cylinder **75** and moves the cam plates **26** and **26'** forwardly so as to raise the lower die assembly **24**. The movement of the slide members **64** and **64'** which carry the cam plates **26** and **26'** actuates the loading assembly **27** through the rack and pinion connection and the cross shaft **152**. The loading plate **120** moves back and down so as to deposit the package assembly on the lower die assembly **24** as the latter moves upwardly. Switch **163** which is mounted on the side plate **138** is operated by cam plate **164** on the slide member **64** as the latter is moved forward to close the lower die assembly **24** on the upper die assembly **25**. The switch **163** controls the operation of a variable electronic timer which operates and times solenoid valves **113** and **114** controlling the vacuum line **112** for evacuating the interior of the die assemblies **24** and **25** after they are closed on each other and sealed. The valve **113** is opened and **114** is closed and timed by the variable electronic timer and at the same instant the timer for controlling the vacuum line is started, a second variable electronic timer is also started, the only function of which is to time the delay of starting a third variable electronic timer, with the time interval corresponding to the time the interior of the unsealed packages are exposed to vacuum. The third timer starts and times the cycle of the steam heated pressure platen **96** by opening the solenoid operated air valve **118** (FIGURE 6) which allows compressed air to enter the top die **25** through passageways **115** and **116** so as to apply pressure to the diaphragm **94**. The force of the compressed air is transmitted by the three pistons **99** to the steam heated pressure platen **96** and the latter moves down onto the package components. As the pressure is applied, the heat activates an adhesive which seals the packages. Upon completion of the time of the vacuum timer, the vacuum is shut off and the area is opened to atmosphere. Upon completion of the time of the pressure timer, the area above the diaphragm **94** is changed from pressure to vacuum which helps return the platen and also prevents prematurely lowering platen **96**. The completion of the time of the pressure timer also starts the reverse motion of the hydraulic piston **75** which lowers the die assembly **24** and simultaneously moves the loading plate **120** forward and upward so as to remove the sheet of sealed packages and return the same to loading position. This completes the cycle of operation of the machine.

In operating the machine a package assembly is placed on the fork-like loading plate **120** and the two starting switches **160** and **161** are held closed while the loading plate **120** moves back and down to deposit the package assembly in the lower die assembly with the container body members positioned in the cavities **32** and depressing the pressure plates **34** against the force of the springs **43**. The lower die assembly **24** is simultaneously moved upwardly by cam plates **26** and **26'** and closes on the upper die assembly **25** as the loading plate moves back

out of the way. The vacuum line **112** is opened by operation of valves **113** and **114** so as to exhaust the air in the chamber formed by the closed dies. After a predetermined time interval the valve **118** is opened and air pressure is applied to the diaphragm **94** which lowers the heated pressure platen **96** to compress the packages and heat seal the superimposed flanges of the container body and closure members. The valves **113** and **114** are operated to relieve the vacuum and the die assemblies are separated by backward movement of the cam plates **26** and **26'**. The loading plate **120** moves forward and up to strip the sealed package assembly from the lower die assembly and returns the same to loading position for removal from the machine.

While particular materials and specific details of construction are referred to in describing the form of the machine illustrated, it will be understood that other materials and equivalent structural details may be resorted to within the spirit of the invention.

We claim:

1. A machine for closing and sealing a package assembly which is characterized by a preformed semi-rigid tray-like container body having a peripheral flange portion extending outwardly of the bottom of the body and a semi-rigid closure panel with a raised product supporting platform adapted to be telescoped within the bottom of the container body and a peripheral flange adapted to be sealed in face engagement with the overlying flange portion of the container body, said machine comprising an upright supporting frame, a lower die assembly mounted for vertical movement on said frame and having an upwardly opening recess in which a container body is adapted to be positioned in inverted relation with a quantity of a product in said body and with a closure panel, also in inverted relation, positioned thereon, an upper die assembly supported on said frame and aligned vertically with said lower die assembly, means for raising said lower die assembly into sealing engagement with said upper die assembly, means for connecting a vacuum line to said die assemblies so as to withdraw air from the die assemblies and the package elements enclosed between the die assemblies, said upper die assembly having a movable pressure applying platen therein with marginal portions thereof overlying marginal portions of the lower die assembly around said upwardly opening recess and means to connect said upper die assembly to an air pressure supply line so as to apply sufficient pressure to said platen to move the same into pressure applying engagement with said closure panel thereby to compress the product between the top of the container body and the platform portion of the closure panel so that the product fills the space within the package while applying sealing pressure to the flange of the container body and the underlying flange of the closure panel trapped between the marginal portions of said lower die assembly and said pressure applying platen.

2. A machine as recited in claim **1**, and said lower die assembly having a pressure applying plate movably mounted therein for co-operation with said platen to compress the product and the associated container body and closure panel portions.

3. A machine as recited in claim **2**, and said pressure applying plate having a resilient supporting means.

4. A machine as recited in claim **2**, and said pressure applying plate having a depending stem and spring means operatively connected to said stem and said die assembly so as to resiliently urge said plate into pressure applying engagement with the lowermost face of the container body.

5. A machine as recited in claim **1**, and said upper die assembly having a guide member and piston means engaging said platen for moving the platen into engagement with the closure panel of the package assembly.

6. A machine as recited in claim **1**, and said pressure applying platen being mounted in said upper die assembly on depending supports having resilient means for resisting downward movement of said platen.

7. A machine for closing and sealing a package assembly which is characterized by a preformed semi-rigid tray-like container body having a peripheral flange portion extending outwardly of the bottom of the body and a semi-rigid closure panel with a raised product supporting platform adapted to be telescoped within the bottom of the container body and a peripheral flange adapted to be sealed in face engagement with the overlying flange portion of the container body, said machine comprising an upright supporting frame, a lower die assembly mounted for vertical movement on said frame and having an upwardly opening recess in which a container body is adapted to be positioned in inverted relation with a quantity of a product in said body and with a closure panel, also in inverted relation, positioned thereon, an upper die assembly supported on said frame and aligned vertically with said lower die assembly, means for raising said lower die assembly into sealing engagement with said upper die assembly, means for connecting said die assemblies to a vacuum line so as to withdraw air from the package elements enclosed between the die assemblies, said upper die assembly having a movable pressure applying platen therein and means to connect said upper die assembly to an air pressure supply line so as to move said platen into pressure applying engagement with said closure panel thereby to compress the product between the top of the container body and the platform portion of the closure panel so that the product fills the space within the package while sealing the flange of the container body to the flange of the closure panel, and a diaphragm in said upper die assembly which is interposed between said platen and the connection with the air pressure supply line so as to equalize the pressure exerted on said platen.

8. A machine as recited in claim **1**, and means incorporated in said platen for heating said platen so as to heat seal the face engaging flanges on the body portion and the closure panel of the package assembly.

9. A machine for closing and sealing a package assembly which is characterized by a semi-rigid sheet material which is preformed to provide one or more tray-like container bodies each having a peripheral flange portion extending about an open side which constitutes the bottom thereof and a semi-rigid sheet of similar material which is preformed to provide a corresponding number of bottom closure panels each having a raised product supporting portion adapted to be telescoped within the open side of a container body and a peripheral flange portion adapted to be sealed in face engagement with the flange portions of the associated container body, said machine comprising a supporting frame, a lower die assembly mounted on said frame and having an upwardly opening recess in which a container body is adapted to be positioned in inverted relation with a quantity of a product in said body and with a closure panel portion assembled in inverted relation thereon, an upper die assembly supported on said frame and aligned vertically with said lower die assembly, means for moving said die assemblies into closed position with said package assembly enclosed between the same and for separating said die assemblies to free the package assembly, means for connecting said die assemblies to a vacuum line so as to withdraw air from the package assembly, said die assemblies having means to apply pressure to the uppermost and lowermost faces of the package assembly enclosed therein whereby to compress the product so that it fills the space within the package and means for sealing the package flanges which are in face engagement with each other, and means associated with said die assemblies for supporting a package assembly while moving it into position for deposit in the lower die assembly as said die assemblies are closed upon each other and for removing the sealed package assembly

from said lower die assembly as said die assemblies are separated.

10. A machine as recited in claim 9, and said means for supporting and moving said package assembly comprising a fork-like supporting plate, a carriage forming frame mounted for reciprocable movement on said supporting frame.

11. A machine for closing and sealing a package assembly which is characterized by a semi-rigid sheet material which is preformed to provide one or more tray-like container bodies each having a peripheral flange portion extending about an open side which constitutes the bottom thereof and a semi-rigid sheet of similar material which is preformed to provide a corresponding number of bottom closure panels each having a raised product supporting portion adapted to be telescoped within the open side of a container body and a peripheral flange portion adapted to be sealed in face engagement with the flange portions of the associated container body, said machine comprising a supporting frame, a lower die assembly mounted on said frame and having an upwardly opening recess in which a container body is adapted to be positioned in inverted relation with a quantity of a product in said body and with a closure panel portion assembled in inverted relation thereon, an upper die assembly supported on said frame and aligned vertically with said lower die assembly, means for moving said die assemblies into closed position with said package assembly enclosed between the same and for separating said die assemblies to free the package assembly, means for connecting said die assemblies to a vacuum line so as to withdraw air from the package assembly, said die assemblies having means to apply pressure to the uppermost and lowermost faces of the package assembly enclosed therein whereby to compress the product so that it fills the space within the package and means for sealing the package flanges which are in face engagement with each other and said means for moving said die assemblies comprising a traveling carriage and co-operating cam means on said carriage and on one of said die assemblies.

12. A machine as recited in claim 11, and means associated with said die assemblies for moving a package assembly into position for deposit in the lower die assemby and for removal of the sealed package assembly therefrom, which means is operated by means responsive to movement of said traveling carriage.

13. A machine for closing and sealing a package assembly which is characterized by a semi-rigid sheet material which is preformed to provide one or more tray-like container bodies each having a marginal flange portion extending about an open side which constitutes the bottom thereof and a semi-rigid sheet of similar material which is preformed to provide a corresponding number of bottom closure panels each having a product supporting portion adapted to close the open side of a container body and a marginal flange portion adapted to be sealed in face engagement with the flange portions of the associated container body, said machine comprising a supporting frame, a lower die assembly mounted on said frame and having an upwardly opening recess in which a container body is adapted to be positioned in inverted relation with a quantity of a product in said body and with a closure panel assembled in inverted relation thereon, an upper die assembly supported on said frame and aligned vertically with said lower die assembly means for moving said die assemblies into closed position with said package assembly enclosed between the same and for separating said die assemblies to free the package assembly, said die assemblies having means to apply pressure to the uppermost and lowermost faces of the package assembly enclosed therein whereby to compress the product so that it fills the space within the package and means for sealing the package flanges which are in face engagement with each other, and said means for moving said die assemblies into closed position comprising a carriage forming frame mounted on said supporting frame for horizontal reciprocation, cam plates on said carriage and cam followers on one of said die assemblies for co-operation with said cam plates so as to move said die assemblies into and out of closed position upon reciprocation of said carriage.

14. A machine for closing and sealing a package assembly which is characterized by a semi-rigid sheet material which is preformed to provide one or more tray-like container bodies each having a marginal flange portion extending about an open side which constitutes the bottom thereof and a semi-rigid sheet of similar material which is preformed to provide a corresponding number of bottom closure panels each having a product supporting portion adapted to close the open side of a container body and a marginal flange portion adapted to be sealed in face engagement with the flange portions of the associated container body, said machine comprising a supporting frame, a lower die assembly mounted on said frame and having an upwardly opening recess in which a container body is adapted to be positioned in inverted relation with a quantity of a product in said body and with a closure panel assembled in inverted relation thereon, an upper die assembly supported on said frame and aligned vertically with said lower die assembly, means for moving said die assemblies into closed position with said package assembly enclosed between the same and for separating said die assemblies to free the package assembly, said die assemblies having means to apply pressure to the uppermost and lowermost faces of the package assembly enclosed therein whereby to compress the product so that it fills the space within the package and means for sealing the package flanges which are in face engagement with each other, and a fork-like means mounted on said supporting frame for horizontal reciprocation which is adapted to receive a package assembly and deposit the same on the lower one of said die assemblies so that it is enclosed between said die assemblies when the latter are in a closed position.

15. A machine as recited in claim 14, and said fork-like means being operated to remove a completed package assembly form said lower die assembly when the die assemblies are moved to open position.

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