May 5, 1970 R. C. BERGSTROM 3,509,686

APPARATUS FOR PACKAGING IN PROTECTIVE ATMOSPHERE

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Fig. 1

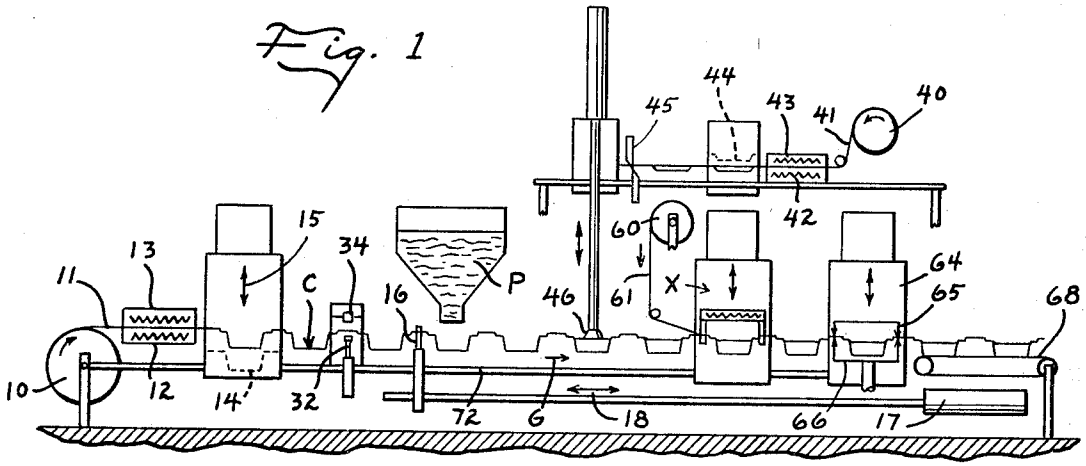


Fig. 2

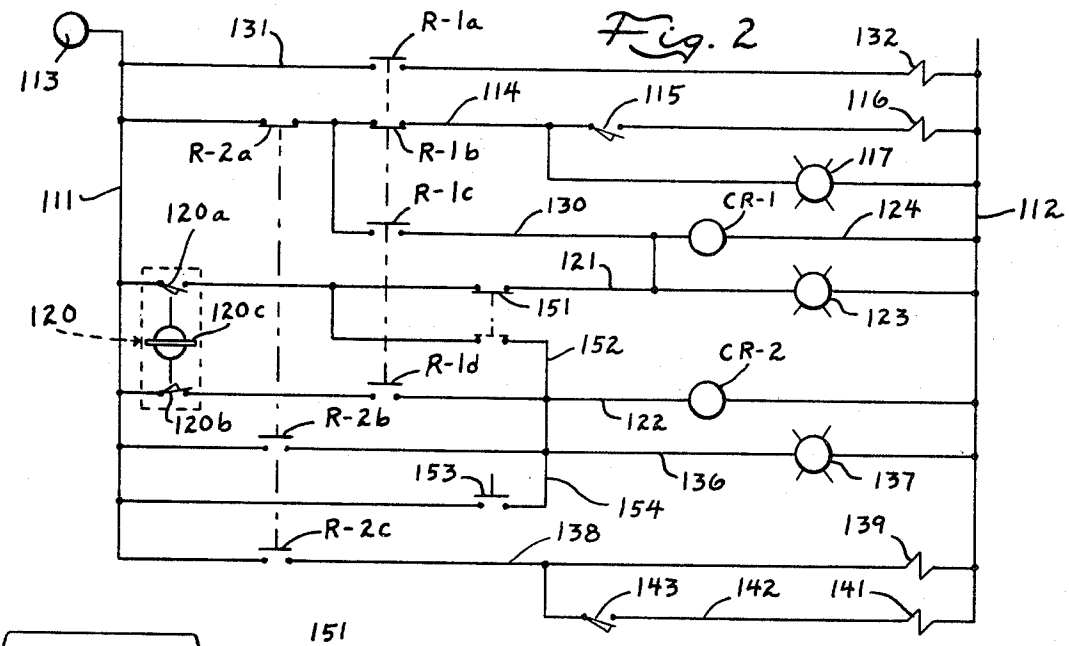
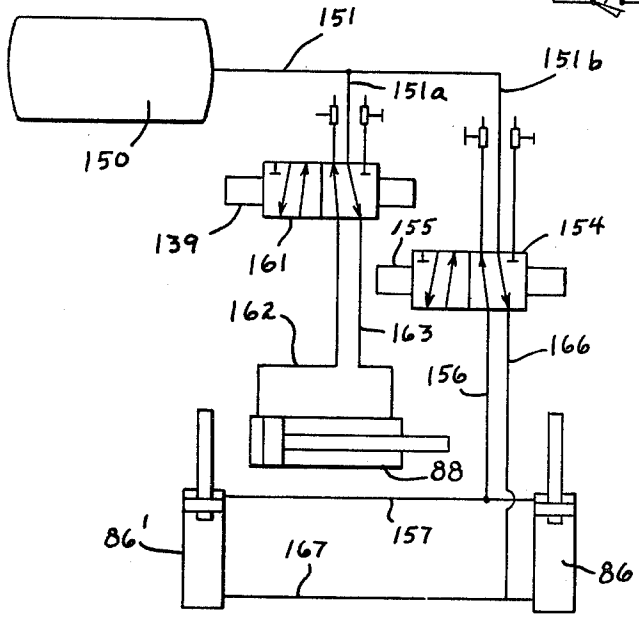


Fig. 3



Inventor
Roger C. Bergstrom

By McCanna, Morsbach & Pillote
Attys

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APPARATUS FOR PACKAGING IN PROTECTIVE ATMOSPHERE

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Fig. 4

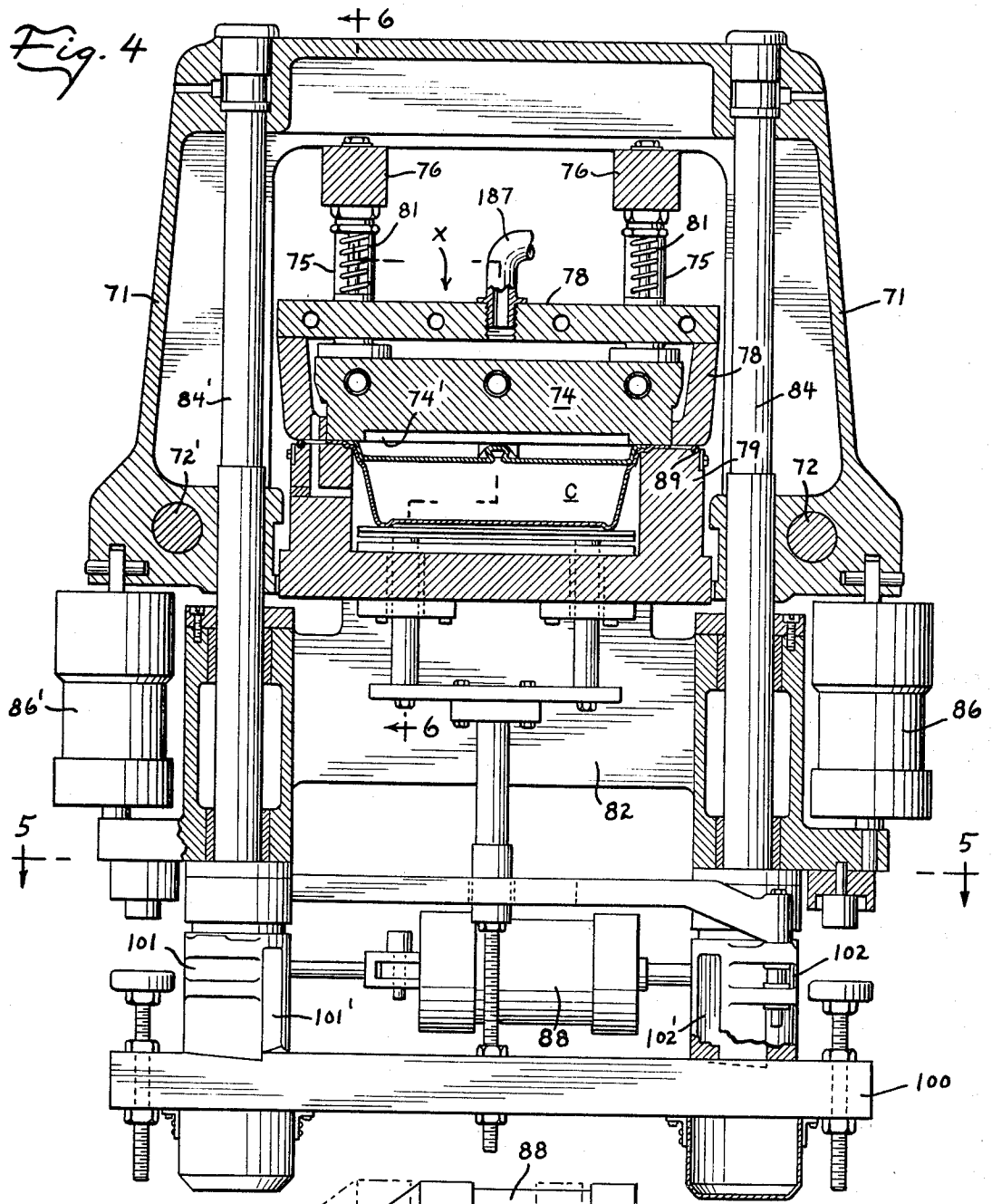
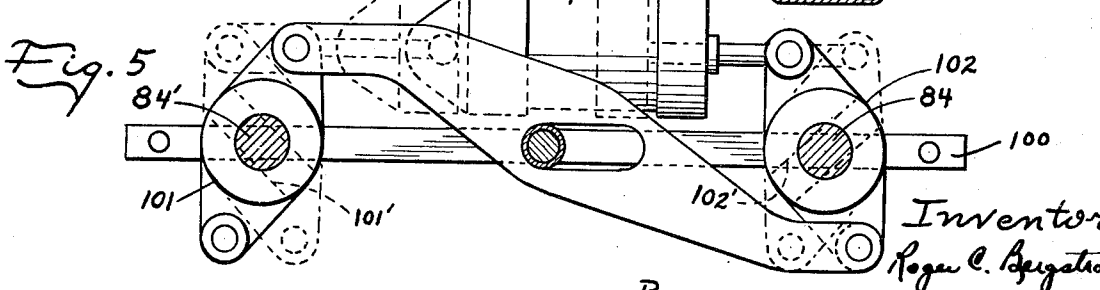


Fig. 5



Inventor
Roger C. Bergstrom

By McCanna, Morsbach & Pillote
Attys

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APPARATUS FOR PACKAGING IN PROTECTIVE ATMOSPHERE

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Fig. 6

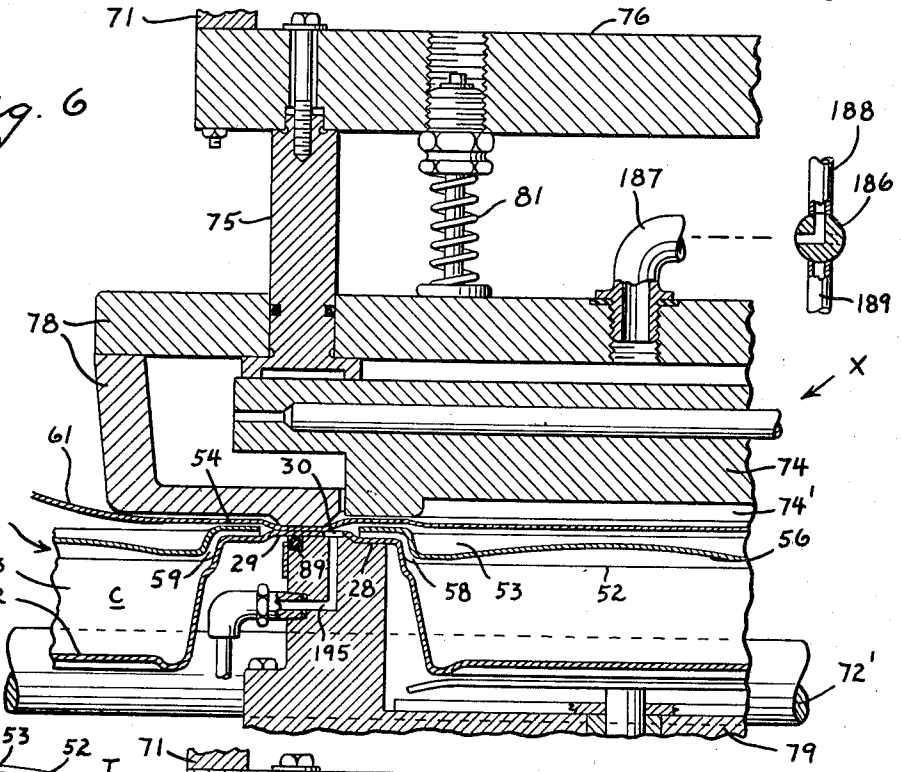


Fig. 8

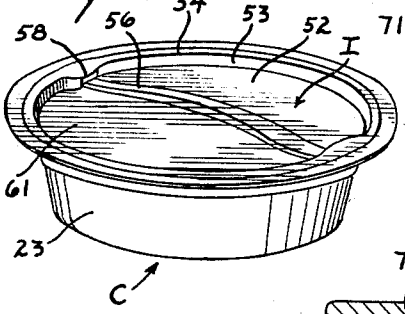
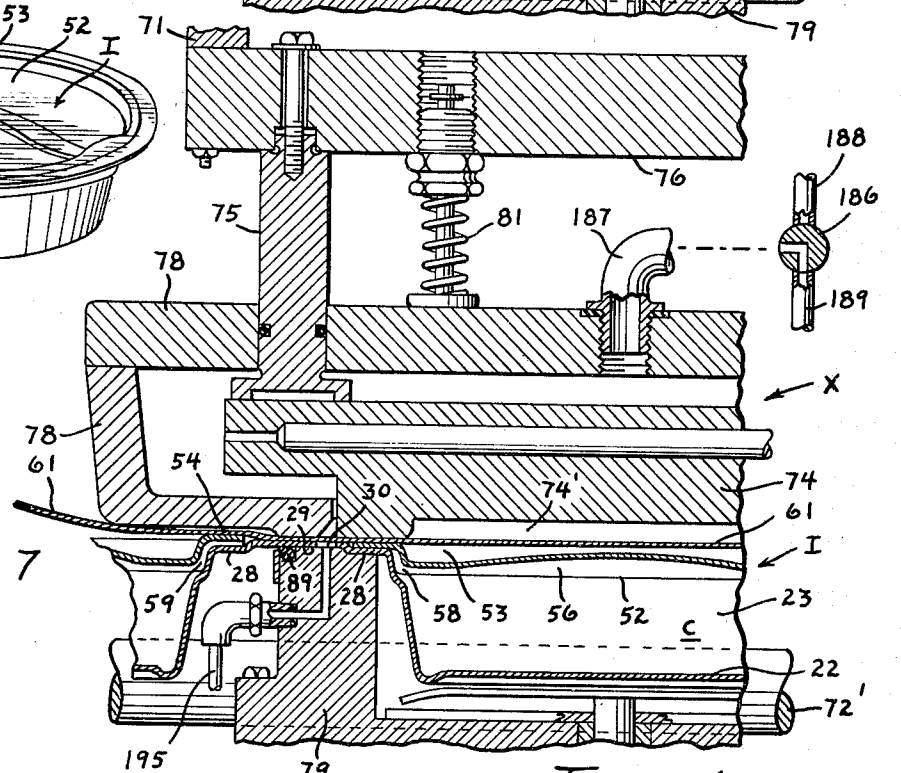


Fig. 7



Inventor
Roger C. Bergstrom

By McCanna, Morsbach & Pillote
Attys

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3,509,686

APPARATUS FOR PACKAGING IN PROTECTIVE ATMOSPHERE

Roger C. Bergstrom, Rockford, Ill., assignor to Anderson Bros. Mfg. Co., Rockford, Ill., a corporation of Illinois

Continuation-in-part of application Ser. No. 596,581, Nov. 23, 1966. This application June 27, 1968, Ser. No. 740,713

Int. Cl. B65b *31/02*

U.S. Cl. 53—112 10 Claims

ABSTRACT OF THE DISCLOSURE

A machine is provided for periodically advancing a sheet of plastic material and providing a dwell period at forming, filling and sealing stations. The sealing station includes an evacuable chamber for removal of air and introduction of a protective atmosphere prior to sealing. Control apparatus is provided for sequentially performing these operations independent of time, so the container remains unsealed unless operations are completed within the dwell period.

CROSS-REFERENCE

This is a continuation-in-part of application Ser. No. 596,581, filed Nov. 23, 1966, now Patent No. 3,481,100.

BACKGROUND

This invention pertains to packaging apparatus and more particularly to apparatus for evacuating a receptacle or container, filling with a protective atmosphere, and closing.

Many products are presently marketed in packages formed by wrapping gas-impervious sheet material around the product and exhausting air from the package. This is known as vacuum packaging. Food products such as cheese and meats are typical of products benfited by this type of packaging since it reduces the tendency of product deterioration by oxidation. More recently, the air in packages has been replaced by an inert or protective gas, e.g. nitrogen, carbon dioxide, and the like. These protective atmospheres further contribute to the preservation of the product. Previous methods have involved the gas flush principle in which the package is partially sealed and the protective gas flowed into the package through a lancet or the like extending into the package. The lancet is withdrawn and the end of the package is subsequently sealed. Another previous method has involved a type of vacuum packaging in which the air is exhausted from the package and partially replaced with a protective atmosphere. The package is then sealed. This causes the package to collapse around the product when exposed to atmosphere.

The parent application discloses a novel method and apparatus for packaging in protective atmosphere. That application contemplates placing a container in an evacuable chamber for a preselected period of time, and evacuating, gasing, and sealing during selected portions of the period. Thus the machine would produce a sealed package whether or not other operations were properly performed. For example, if proper evacuation was not achieved, for any reason, the container would still be gased and sealed. A visual inspection of the package would not reveal such a deficiency in operation. Also, if proper gasing was not accomplished, the container would also be sealed.

SUMMARY

The present invention relates generally to packaging apparatus and more particularly to apparatus for packaging in a protective atmosphere. The invention is realized through the provision of an evacuable chamber into which a container is inserted for a preselected dwell period. Means is provided for sequentially evacuating the chamber independent of time, refilling the container with a protective atmosphere independent of time, and sealing a cover member to the container. In this manner, the container remains unsealed unless the sequential operations are performed within the preselected dwell period.

It is an object of the present invention to provide a new and useful packaging apparatus for evacuating a container and refilling with a protective atmosphere.

Another object is to provide a packaging apparatus in which any deficiency in operation is readily apparent from a visual inspection of the package.

Still another object of the present invention is to provide a packaging apparatus in which the container remains unsealed unless the evacuating, gasing, or sealing operations are properly accomplished within a preselected period.

These, and other objects and advantages of the present invention, will become apparent as the invention becomes better understood from the following detailed description when taken in conjunction with the accompanying drawings.

DRAWING

FIG. 1 is diagrammatic illustration of an embodiment which incorporates the present invention;

FIG. 2 is a diagrammatic view of the electrical controls;

FIG. 3 is a diagrammatic view of the pneumatic controls;

FIG. 4 is a view, partly in cross-section and partly in elevation, of the sealing station and evacuable chamber and showing the relationship of the parts in the sealing position;

FIG. 5 is a view taken generally along line **5—5** of FIG. 4 and showing a moved position in phantom lines;

FIG. 6 is a sectional view taken along broken line **6—6** of FIG. 4 and showing the relationship of the parts during the evacuating and gasing operations;

FIG. 7 is a view similar to FIG. 6 but with the apparatus in sealing position; and

FIG. 8 is a perspective view of a suitable package utilized in the present invention.

Reference is now made more particularly to the drawings which illustrate the best presently known mode of carrying out the invention and wherein similar reference characters indicate the same parts throughout the several views.

As diagrammatically illustrated in FIG. 1, a roll **10** of thermoplastic material is supported adjacent one end of the machine. A web **11** is advanced longitudinally of the machine past successive stations. Heating heads **12** and **13** heat the web **11** so that it may be formed into any desired shape. At the next station, a cup-like member, generally designated C, is pressure formed in web **11** by a mandrel **14** adjacent one side of the web and pressure adjacent the other side. It is contemplated that vacuum forming may also be utilized, and the term "pressure-formed" should be taken as including pressure forming, vacuum forming, and other types of forming. Mandrel **14** moves in the direction of arrows **15** between a forming position generally contiguous to the web and a second position (shown in dashed lines) removed from the web so that the web may be intermittently advanced. Web advancement is accomplished by a gripper **16** which is reciprocated by a piston **17** in the direction of arrows **18**.

While other shapes are contemplated, a suitable cup-like container C is shown in FIG. 8. The container has a bottom **22** and a side wall **23** which advantageously

slopes uniformly upwardly from the bottom **22**. The upper end of the side wall is preferably coplanar and defines the open end of the container. An outwardly projecting flange extends outwardly around the periphery of the side wall and at the upper end thereof. The outwardly projecting flange advantageously includes an inner portion **28** and an outer portion **29** stepped above the inner portion a preselected distance. The inner portion **28** is coplanar with the upper end of the side wall and extends a distance outwardly therefrom. The outer portion **29** has its upper face at a level above the upper face of inner portion **28** and defines a plane parallel thereto. As can be seen in the drawings, a series of containers C is advantageously formed in web **11** in such a manner that adjacent outer portions **29** are interconnected.

After the container C is formed in web **11**, it is advanced to a third station where an opening **30** is formed in the flange member. The opening is formed by means of a punch **32** and a die **34** (see FIG. 1) mounted at said third station. It is contemplated that the opening may also be formed at the aforedescribed forming station, if desired. Preferably, opening **30** is formed in the outer flange portion **29** and in the interconnecting portion between two adjacent containers. As shown, opening **30** is closer to one container for a purpose which will hereinafter become apparent.

At a fourth station, a preselected quantity of a product P is dispensed into the container C. While the product P may be any type which may be handled and packaged, in accordance with the present invention it would be a product advantageously packaged in a protective atmosphere such as carbon dioxide, nitrogen, argon, active nitrogen, or the like.

Simultaneously with the above operation, a second roll of thermoplastic material **40** is supported on the machine and a web **41** withdrawn therefrom. In similar fashion, the web **41** is heated by heating members **42** and **43**. An inner cover, generally designated I, is pressure-formed by mandrel **44**. The web **41** is advanced to a cutting station where cutters **45** accurately cut the inner cover I to its required shape. Preferably, the inner cover I is shaped to lie contiguous to the inner flange portion **28** and span the open end of container C. The inner covers I are gripped by a reciprocating head **46** which deposits each inner cover on a respective container C which has been filled with product P.

In the embodiment illustrated, inner cover I includes a spanning portion **52** extending adjacent the side wall **23** of container C and at a level below the upper end thereof. Wall **53** extends upwardly from spanning portion **52** and tapers outwardly generally parallel to side wall **23** of the container. The taper of side wall **53** advantageously provides a self-centering action when the inner cover is placed in position and allows the inner cover to nest in the position illustrated in the drawings with its wall **53** generally contiguous to side wall **23**. A peripheral portion **54** extends outwardly from wall **53** and is engaged with inner flange portion **28** of the container C. An arched handle **56** is formed across the spanning portion **52** to provide a grip for removal of the inner cover I. It will be noted that the handle is hollow and is above the level of the spanning portion at all points. At opposite ends of the hollow handle **56** are channels **58** and **59** which are preferably formed in wall **53** and peripheral portion **54**. As illustrated, channel **58** is preferably formed in the area of opening **30** to provide communication between the opening and the interior of container C. The advantages of channels **58** and **59** will hereinafter become more apparent.

In some packages, inner cover I may be omitted and the entire flange member may be planar. The channels **58** and **59** are not required in such an arrangement; however, if desired, the channels may then be advantageously formed in the flange member and extending from opening **30** to side wall **23**.

A third roll **60** is supported on the apparatus, and a thin, flexible sheet **61** is withdrawn therefrom. Sheet **61** is advantageously stretchable and adapted to be sealed to the flange member of container C along a preselected peripheral area. Preferably, compatible thermoplastic materials are selected for web **11** and sheet **61**, and the sealing may be accomplished by heat sealing. It should be understood, however, that other materials may be utilized and that other sealing methods may be used. In some embodiments, it is preferable that sheet **61**, which provides the cover member of the finished package, be flexible for a purpose hereinafter to become apparent. Sheet or cover member **61** is placed in juxtaposition to the flange member, as shown, and the container C, inner cover I, and cover member **61** advanced to a sealing station which includes an evacuable chamber, generally designated X, and illustrated in detail in FIGS. 4–6. At chamber X, the air is evacuated from the chamber and container C, a protective atmosphere of a preselected type is introduced through the opening **30** into the container C, and the cover member **61** is thereafter hermetically sealed to the outer flange portion **29** and inwardly of the opening **30**. The apparatus will hereinafter be described in detail.

At this point, a plurality of sealed packages is interconnected in a continuous web as illustrated in FIG. 1. The web of sealed packages is advanced to another station **64** where the packages are cut from the web by cutters **65** and **66**. The completed packages are deposited on a conveyor **68**, and the waste portion of the web is fed out of the machine. At cutting station **64**, the continuous web is conveniently cut inside of the outer extremity of the seal area effectuated at the sealing station to insure that the seal between cover member **61** and outer flange portion **29** extends entirely to the edge. This provides a very neat package with no loose outer cover. If desired, a peel portion of any desired length may be formed outwardly of the seal area in any convenient manner.

As explained above, vacuum packing has the disadvantage of collapsing the package when it is exposed to atmospheric pressure. Additionally, a certain residue of air is necessarily left in the package, and this can cause some deterioration of certain products, such as meat. The gas-flush process allows a protective atmosphere to be flowed into the package; however, in the past this has necessitated partially sealing the package and introducing the protective atmosphere through a lancet or the like extending into the container. It is desirable to reduce the residue of air in the container to a minimum, flow a protective atmosphere into the container, and thereafter hermetically seal the package. In accordance with the present invention, these operations are sequentially performed, and each successive operation is accomplished only after successful completion of the preceding operation. These operations are advantageously performed at the sealing station illustrated in FIGS. 4, 6 and 7.

As seen in FIG. 4, the sealing station includes a frame member **71** which forms a partial enclosure. Frame member **71** is supported by support bars **72**, **72'** which extend longitudinally of the machine, as shown in FIG. 1. A sealing head **74** is rigidly supported on the frame member **71** by means of columns **75** and mounting brackets **76**. The evacuable chamber X is movably mounted at the sealing station and includes an upper portion **78** and a lower portion **79**. The upper portion **78** is resiliently mounted on the mounting bracket **76** by means of a plurality of springe **81**. The lower portion **79** is mounted for movement with a movable frame member **82** in any convenient manner. In the embodiment illustrated, movable frame member **82** is mounted for movement relative to stationary frame member **71** and, for this purpose, is slidably mounted on slide rods **84**, **84'**. The movable frame

member **82**, and hence the lower portion of the evacuable chamber **79**, is movable between an open position (not shown) and an intermediate position (shown in FIG. 6) by actuation of pneumatic cylinders **86, 86'**. From the intermediate position, the lower portion **79** is movable to its upper position (shown in FIG. 7) by actuation of a pneumatic cylinder **88** as described. At the open position, the container C, intercover I, and cover member **61** are advanced into the evacuable chamber by the operation of gripper **16** which advances sheet **11** in the direction indicated by arrow G in FIG. 1. As previously described, the advancement of the sheet of container material is intermittent and thus these items are disposed in the evacuable chamber for a period of time hereinafter sometimes called a preselected dwell time.

From its lower position, lower member **79** is movable to the intermediate position engaged with upper portion **78** to form a generally air-tight enclosure (FIG. 6). As shown, a gasket **89** is conveniently utilized to insure that the enclosure is substantially gas tight. At this position evacuation of the chamber X is performed and, thereafter, the container is refilled with an inert gas or protective atmosphere which is introduced through passage **195** communicating with opening **30**. The protective gas flows through the channels **58** and **59** to fill the container and into the chamber X. If no inner cover I is used, a flexible cover allows the gas to flow into the container as described in the aforesaid opplication Ser. No. 596,581. After gasing, the lower portion **79** is moved to its upper position to engage the cover member against sealing head **74**.

As can be seen, the sealing head **74** is disposed in a cavity within the upper portion of the evacuable chamber and the sealing head has a projecting flange **74'** having a shape generally corresponding to the flange member of the container for sealing the cover member **61** thereto. The sealing head may be heated in any convenient manner; or may be adapted for pressure sealing, if a pressure sensitive adhesive is utilized. Ultrasonic or high frequency sealing and other sealing methods may also be used, if desired. As best seen from FIG. 7, when the lower portion **79** moves to the sealing position, it pushes the resiliently mounted upper portion **78** with it and thereby maintains the air tight enclosure.

As stated above, movement of the evacuable chamber X to the sealing position is accomplished by actuation of pneumatic cyclinder **88**. The apparatus which cooperates with pneumatic cylinder **88** to accomplish this operation will now be described. As shown in FIG. 4, a cam support block **100** is rigidly mounted on the machine in any convenient manner. Knuckle joints **101** and **102** are provided with slots **101'** and **102'**, respectively, for straddling the block **100** in one position. As shown knuckle joints **101** and **102** are each provided with cam faces at their bottom sides. The knuckle joints are rotatably mounted at the bottom of slide rods **84** and **84'** for movement between one position shown in phantom in FIG. 5, and another or camming position shown in full lines in FIGS. 5 and 6. At the one or straddling position, slots **101'** and **102'** straddle the cam block **100** to allow the lower portion of the evacuable chamber to be moved between the lower and the intermediate positions by pneumatic cylinders **86, 86'**. When at the intermediate position, the cam faces of the knuckle joints are at the upper face of cam block **100**. When the pneumatic cylinder **88** is actuated, it rotates the knuckle joints to their camming position which forces the movable support frame **82** upwardly a pre-selected distance and thereby moves the evacuable chamber to the sealing position.

As previously described, the machine advances the container into the evacuable chamber where it is disposed for a preselected dwell period. In accordance with the present invention, evacuation, gasing, and sealing are sequentially performed without regard to time, whereby the container remains unsealed unless the operations are successfully performed within the dwell period. In other words, this procedure assures that a sealed container is one which has had the operations successively performed.

The controls for achieving this desirable result are diagrammatically illustrated in FIG. 2. As shown, the control means includes an electrical circuit having a supply line **111** and a return line **112**. A timing mechanism **113**, conveniently operated in timed relation with the reciprocating mechanism of the machine, is operative to supply power to line **111** during the preselected dwell period and to cutoff the power at the end of the dwell period. A conductor **114** extends between lines **111** and **112** and has a limit switch **115** interposed therein. Limit switch **115** is operated by the movement of the lower portion **79** of the evacuable chamber to its intermediate position. When switch **115** is thus closed, a circuit is completed and actuates solenoid **116** to start evacuation of the chamber. A light **117** is wired in parallel to the switch **115** and solenoid **116** and may be located at any convenient position to indicate that this operation is being performed.

A pressure-sensitive switch, indicated generally at **120**, is responsive to the pressure in the evacuable chamber X and includes a normally open switch **120*a*** interposed in a conductor **121** and a normally closed switch **120*b*** interposed in conductor **122**. Both conductors **121** and **122** extend between lines **111** and **112** as shown. When a preselected vacuum is drawn, a movable diaphragm **120*c*** closes switch **120*a*** and completes the circuit to a solenoid CR–**1** and a light **123** which indicates the gasing step. The preselected vacuum is preferably adjustable by suitable adjusting apparatus on the pressure-sensitive valve **120**. Solenoid CR–**1** operates relay switches R–**1*a***, R–**1*b***, R-**1*c*** and R–**1*d***. Relay switch R–**1*b*** is interposed in conductor **144** and is opened by solenoid CR–**1** thereby breaking the evacuation circuit to cease evacuation. Normally open relay R–**1*c*** is interposed in line **130** which is connected to conductors **114** and **124** to provide a holding circuit for solenoid CR–**1**. Normally open relay R–**1*a*** is interposed in conductor **131** and, when actuated by the solenoid CR–**1**, completes the circuit and actuates solenoid **132** to start the gasing operation.

When the pressure of the gas or inert atmosphere reaches a preselected level which may be regulated by adjustment of pressure-sensitive valve **120**, switch **120*b*** is returned to its closed position thereby completing the circuit through relay switch R–**1*d*** and conductor **122**, and actuating solenoid CR–**2**. Solenoid CR–**2** operates relay switches R–**2*a***, R–**2*b***, and R–**2*c***. The opening of normally closed relay switch R–**2*a*** breaks the holding circuit to solenoid CR–**1** and thereby interrupts the gasing operation. Relay switch R–**2*b*** is interposed in conductor **136** and, when closed, creates a holding circuit for solenoid CR–**2** and also lights light **137** to indicate that the sealing operation has begun. Relay switch R–**2*c*** is interposed in conductor **138** and, when closed, completes a circuit to solenoid **139** which causes actuation of pneumatic cylinder **88** and moves the evacuable chamber X to the sealing position. Wired in parallel with solenoid **139** is another solenoid **141** interposed in line **142**. A limit switch **143** is also interposed in line **142** and is closed by movement of the evacuable chamber to the sealing position. This completes the circuit and actuates solenoid **141** which vents the evacuable chamber to atmosphere thereby allowing the chamber to be subsequently opened.

As seen in FIGS. 4, 6, and 7, the evacuable chamber X is provided with an outlet conduit **187** conveniently located in the upper portion **78**. The chamber can be placed in communication with the atmosphere or with a vacuum pump (not shown) by means of a valve **186** connected to outlet conduit **187**, pump conduit **188** and atmosphere conduit **189**. Valve **186** may also be moved to a position, shown in phantom in FIG. 6, to block flow through conduit **187** as during the gasing operation. The aforemen-

tioned solenoid **116** moves the valve **186** to evacuation position (FIG. 6), solenoid **132** moves the valve to the blocking position, and the solenoid **141** moves the valve to position for venting to atmosphere (FIG. 7).

To increase the versatility of the machine, a manual switch **151** is provided and is selectively movable from a position interposed in conductor **121** and a position shown in phantom where it is interposed in a pass-by line **152**. When moved to the position in line **152**, switch **151** causes a by-pass of the gasing controls and allows the machine to be used for vacuum packaging. In other words, the operation consists of evacuation and then sealing. Another switch **153** is provided in a by-pass line **154** and, when closed, causes by-passing of both the evacuation ad the gasing operations. In other words, upon supplying current to line **111** when switch **153** is closed, a circuit is completed through solenoid CR–2, and the machine immediately seals the cover to the container without evacuation or gasing of the container.

A suitable pneumatic circuit is diagrammatically illustrated in FIG. 3. As shown, a supply reservoir **150** contains a supply of air under pressure and has a supply line **151** leading therefrom. Supply line **151** has branches **151***a* and **151***b*. A two-way valve **154**, operated by a solenoid **155** controls the flow of air from branch **151***b* to pneumatic cylinders **86** and **86'**. Solenoid **155** is operated at the beginning of the preselected dwell period to move the valve **154** from the position illustrated to its other position. This supplies air under pressure to lines **156** and **157** and thereby actuates pneumatic cylinders **86** and **86'**. A second two-way valve **161** is operated by the aforedescribed solenoid **139** to move the valve from the position shown to its second position. This supplies air from branch **151***a* to line **162** and thereby actuates pneumatic cylinder **88**. After the sealing is accomplished and timer **113** discontinues supplying current to the control circuit, the valve **161** is returned to the position shown and air is supplied to line **163** to move pneumatic cylinder **88** in the opposite direction. Valve **154** is also returned to the position shown and air is supplied from branch **151***b* through lines **166** and **167** to return pneumatic valves **86** and **86'** to the position illustrated and thereby move lower portion **79** of the chamber to its lower position.

It is now deemed obvious that the present invention provides an apparatus in which containers are intermittently advanced to a sealing station and which provides a dwell period thereat. During the dwell period, the operations of evacuation, gasing, and sealing are performed independent of time so that a sealed container is a sign that all operations have been successfully performed.

The invention, in its broader aspects, is not limited to the specific mechanism shown and described but departures may be made therefrom within the scope of the accompanying claims without departing from the principles of the invention, and without sacrificing its chief advantages.

What is claimed as new is:

1. An apparatus for packaging in a protective atmosphere including: an evacuable chamber having an upper portion and a lower portion movable relative to each other between an open position and a substantially airtight closed position; means for moving at least one container and cover member into and out of the chamber while said portions are in open position and for providing a dwell period of preselected duration in the chamber; means for moving the chamber portions to closed position after the container and cover member are in the chamber; evacuating means for reducing the pressure in the chamber to a first preselected level independent of time; refill means for introducing the protective atmosphere into the container and increasing the pressure to a second preselected level independent of time; a sealing head disposed in the chamber for sealing the cover member to the container; operating means for sequentially operating the evacuating means, refill means, and sealing head independent of time; and means for energizing the operating means only during the preselected dwell period so that the container remains unsealed unless the sequential operations are performed within the preselected dwell period.

2. An apparatus for packaging in a protective atmosphere as set forth in claim **1** wherein the operating means includes pressure-actuated switching means responsive to the first preselected level to cease operation of the evacuating means and to start operation of the refill means, and responsive to the second preselected level to cease operation of the refill means.

3. In an apparatus for packaging in a protective atmosphere including a forming station for forming a container in a sheet of formable plastic material; a filling station for depositing a material to be packaged in the container; a sealing station for hermetically sealing a cover member to the container; and means for sequentially advancing the sheet to the stations and for providing a dwell period of preselected duration at the stations; the improvement comprising: an evacuable chamber at the sealing station for receiving the container and cover member therein during the dwell period; evacuating means for reducing the pressure in the chamber to a first preselected level independent of time; a source of protective atmosphere; refill means for introducing the protective atmosphere into the container and increasing the pressure therein to a second preselected level independent of time; a sealing head disposed in the chamber for sealing the cover member to the container after the refill means has operated; and control means for sequentially operating the evacuating means, refill means, and sealing head independent of time whereby the container remains unsealed unless the operations are performed within the preselected dwell period.

4. The combination of claim **3** wherein the evacuable chamber includes upper and lower portions movable relative to each other between a closed position to provide a substantially gas-tight chamber and an open position for entry of the container and cover member, and means for moving the portions to the closed position at the beginning of the dwell period and to the open position at the end thereof; and wherein the control means includes first means responsive to the portions at their closed position to start operation of the evacuating means.

5. The combination of claim **4** wherein the lower portion of the chamber is arranged to support the container in the closed position, wherein the sealing head is initially spaced above the lower portion of the chamber, and including moving means responsive to the control means for effecting relative movement of the sealing head and the lower portion of the chamber to engage the cover member with the sealing head for the sealing operation, and wherein the control means includes second means responsive to the relative movement of the sealing head and the lower portion of the chamber to vent the chamber to atmosphere.

6. The combination of claim **5** wherein the control means includes pressure-actuated switching means responsive to the first preselected level to cease operation of the evacuating means and to start operation of the refill means, and responsive to the second preselected level to cease operation of the refill means and to start operation of the moving means.

7. The combination of claim **6** wherein the first means includes a first switch actuated by the relative movement of the portions to their closed position, the second means includes a second switch actuated by the relative movement of the sealing head and the lower portion of the chamber, the control means includes an electrical circuit connecting the first and second switches and the pressure actuated switching means in parallel, and the control means also includes means for supplying current

to the electrical circuit only during the preselected dwell period.

8. The combination of claim 3 wherein the forming station forms a container having an out turned peripheral flange at the open end thereof; the evacuable chamber includes upper and lower portions movable relative to each other between an open position for receiving the container and cover member and a substantially air-tight closed position, the lower portion being arranged to support the peripheral flange and container; and including means for positioning the cover member in juxtaposition to the peripheral flange, means for forming an opening in the peripheral flange prior to entry of the container into the evacuate chamber; and wherein the evacuating means communicate with the chamber outwardly of the container, and the refill means has an outlet at the underside of the flange and communicating with the flange opening for introducing the protective atmosphere therethrough.

9. The combination of claim 8 wherein the sealing head is initially above the container and cover member, the sealing head and lower portion being movable relative to each other to contact the sealing head with the cover member, and the sealing head being shaped to seal the cover member to the container along a seal line located inwardly of the flange opening.

10. The combination of claim 9 including moving means for moving the sealing head and cover member relative to each other; and wherein the control means includes pressure-responsive switching means responsive to the first preselected level to cease operation of the evacuating means and to start operation of the refill means, and responsive to the second preselected level to stop operation of the moving means.

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TRAVIS McGEHEE, Primary Examiner