

Description

TECHNICAL FIELD

This invention relates to an apparatus for packaging products and more particularly to an apparatus for vacuum sealing plastic bags.

BACKGROUND OF THE INVENTION

Various apparatus and methods are now used for the purpose of vacuum sealing plastic bags to protect perishables, such as foodstuffs, and other products against oxidation. Conventional apparatus are generally expensive to manufacture, complex in construction and cumbersome to operate. One conventional type of vacuum sealing system, primarily used for commercial packaging purposes, includes a vacuum chamber in which the entire packaged product is placed, along with heat sealers and attendant components of the system.

Another type of conventional vacuum sealing system uses a vacuum nozzle that is inserted within a plastic bag for evacuation purposes. Although adaptable for low-volume home use, the latter type of system is cumbersome to use and normally requires a liquid separator or filter to prevent liquids or powders, retained within the bag, from being drawn into a vacuum pump connected to the nozzle. Further, the heat sealer employed therein must be closely calibrated and synchronized with the positioning and withdrawal of the vacuum nozzle from the bag.

Still another type of conventional vacuum sealing system places a portion of a bag, containing a product to be packaged, in a first vacuum chamber and extends an open end or neck of the bag into a second vacuum chamber. The first vacuum chamber is then evacuated to expand the neck of the bag to isolate the chambers from each other whereafter a vacuum is drawn in the second vacuum chamber to evacuate the bag. Thus, isolation of the two chambers from each other, during evacuation of the second vacuum chamber, is critically dependent on the physical properties composing the neck of the bag (which is intended to form a static seal between the two chambers) and very close synchronization and calibration of the evacuation and sealing procedures and controls therefor. A vacuum sealing system of this type is disclosed in US-A-3,928,938, for example.

US-A-2,778,171 discloses another vacuum sealing system which, to applicant's knowledge, has not been commercialized. In particular, the open end of a plastic bag is placed between a pair of jaws (Figures 14-17) or between a lower jaw and a flexible sheet (Figures 18-20) to evacuate the bag which is then heat sealed. An inner surface of the

bag has protuberances (Figures 1-4) formed on it which make point contact with an opposed surface of the bag to define air exhaust passages during evacuation.

Another type of vacuum sealing apparatus is described in US-A-4 561 925. This type of evacuation and sealing device locates the plastic bag and item to be sealed in the atmosphere. A nozzle is inserted into the bag to apply a vacuum to the inside of the bag and prevent the end of the bag from collapsing during evacuation.

In US-A-3 699 742 there is disclosed another type of apparatus for vacuum sealing a plastic bag having overlying first and second panels defining an evaluative chamber and overlying heat sealable panel portions terminating at an open end of the bag communicating with the evaluative chamber. The apparatus comprises a hood movable to a closed position on a support surface to position a frontal side thereof over the open end and sealable panel portions of the bag, the hood at least in part defining a vacuum chamber means when the hood is moved to the closed position on the support surface. A static seal means is mounted beneath the hood and circumvents the vacuum chamber means for statically sealing the vacuum chamber means from ambient when the hood is in its closed position. An evacuation means communicates with the vacuum chamber means for selectively evacuating the vacuum chamber means and the evacuative chamber of the bag. The apparatus further comprises a heat sealing means, including a heating element mounted forwardly on the apparatus for selectively forming an air-tight heat seal across the sealable panel portions of the bag to maintain the vacuum within the evacuative chamber of the bag. The apparatus in US-A-3 699 742 has a large vacuum chamber into which is placed the plastic bag containing an item to be sealed.

An object of this invention is to provide a highly efficient, non-complex, economical and improved vacuum sealing apparatus that exhibits ease of operation and that is adapted to vacuum seal a plastic bag having overlying first and second panels defining an evacuative chamber therebetween and overlying heat sealable panel portions terminating at an open end of the bag, communicating with the evacuative chamber. A plastic bag of this type is disclosed in applicant's US-A-4,756,422.

The invention is characterized by the features of claim 1.

In a preferred embodiment of the invention, the apparatus comprises a base defining an upper support surface adapted to receive the open end and sealable panel portions of the bag thereon, and the hood is mounted on the base and movable to a closed position to position a frontal side thereof

over the open end and sealable panel portions of the bag. The hood and base define the vacuum chamber therebetween adapted to receive the open end of the bag in exposed relationship therein. The static seal circumvents the vacuum chamber and is disposed between the base and hood for directly engaging outer surfaces of the sealable panel portions of the bag in response to movement of the hood to its closed position. The seal isolates the open end of the bag and the vacuum chamber from ambient and maintains the open end of the bag in communication with the evacuative chamber thereof. An evacuation system communicates with the vacuum chamber for evacuating the evacuative chamber of the bag and cooperates with the vacuum chamber to prevent liquids and powders from entering a pump of such evacuation means. A heat sealer, mounted forwardly on one of the base and hood, forms an air-tight seal across the sealable panel portions of the bag to maintain the vacuum within the evacuative chamber of the bag.

In another aspect of this invention, the working components of a self-contained apparatus are mounted in a hood. The hood is adapted for mounting on a base or can be used independently, such as by placing it on a support surface defined on a counter top or the like.

In still another aspect of this invention, a vacuum sealing attachment is provided for attachment to a container. The vacuum sealing attachment communicates with the vacuum chamber of the apparatus whereby the apparatus can be further utilized to evacuate the container.

BRIEF DESCRIPTION OF THE DRAWINGS

Other objects and advantages of this invention will become apparent from the following description and accompanying drawings wherein:

Figure 1 is an isometric view illustrating a vacuum sealing apparatus of this invention as it would appear during the vacuum sealing of a plastic bag of the type disclosed in applicant's U.S. Patent No. 4,756,422;

Figure 2 is an isometric view of a preferred embodiment of the plastic bag;

Figure 3 is an enlarged isometric view partially illustrating an inner surface of one of the panels of the plastic bag, including a plurality of raised protuberances and intercommunicating channels formed thereon;

Figure 4 is an enlarged sectional view illustrating overlying panel portions of the bag as they would appear between a pair of elastomeric seals during a vacuum sealing operation;

Figure 5 is a top plan view of the apparatus;

Figure 6 is a bottom plan view of a hood of the apparatus, taken in the direction of arrows VI-VI

in Figure 1;

Figure 7 is a transverse cross-sectional view through the apparatus, taken in the direction of arrows VII-VII in Figure 1, showing the hood in a closed position during a vacuum sealing operation;

Figure 8 is a partial frontal isometric view of the apparatus, showing its hood in a partially open position;

Figure 9 is a backside isometric view of the apparatus with its hood and base broken-away to expose working components of the vacuum and heat sealing systems of the apparatus;

Figure 10 is a schematic circuit diagram, illustrating vacuum and sealing controls employed in the apparatus;

Figure 11 is a transverse cross-sectional view illustrating a second embodiment of the vacuum sealing apparatus;

Figure 12 illustrates connection of the Figure 1 apparatus to a lid attachment for evacuating a container;

Figure 13 is an enlarged cross-sectional view through the lid attachment, taken in the direction of arrows XIII-XIII in Figure 12; and

Figure 14-19 sequentially illustrate three rotative positions of a thumb nut for the lid attachment.

DESCRIPTION OF THE PREFERRED EMBODIMENT(S)

General Description

Figure 1 illustrates a vacuum sealing apparatus 20 for evacuating and then sealing a plastic bag 21, preferably of the type shown in Figures 2-4 and fully described in applicant's U.S. Patent No. 4,756,422. In particular, the bag comprises overlying first and second panels 22 and 23, respectively, closed on three sides to define an open end 24 at overlying heat sealable panel portions thereof, adapted to facilitate insertion of a food or other packaged product therein. The bag can be either formed from a seamless tube or by overlying, separate sheets, as is well-known to those skilled in the packaging arts. As shown in Figures 2 and 3, a plurality of raised protuberances 25 are formed in a generally regular and waffle-like pattern on the inner surface of panel 22. The protuberances project outwardly from panel 22, towards the inner surface of panel 23, to define a plurality of intercommunicating air-exhausting channels 26 entirely around and between the protuberances.

Although shown formed on the inner surface of panel 22, such protuberances and channels could be formed on the inner surface of panel 23 or on the inner surfaces of both panels. Referring to Figure 4, showing overlying panel portions of the

bag sealed from ambient but with channels 26 remaining open, each panel has a uniform thickness, including the thickness of each protuberance 25 on panel 22. Each inner layer 27 and 28 of the panels is preferably entirely composed of a heat-sealable material, such as polyethylene or polypropylene. Each outer layer 29 and 30 of the panels is preferably entirely composed of a gas impermeable material, such as polyester or Nylon.

As further shown in Figures 2 and 3, the panel having protuberances 26 formed thereon (panel 22 for this embodiment of the bag) may further comprise an intermediate layer 31 suitably bonded between inner and outer layers 27 and 29 to provide added stiffness to this panel to aid in preventing "collapse" of the bag under full vacuum. In particular, the intermediate layer will exhibit a stiffness greater than each of the inner and outer layers and may be composed of a high density polyethylene, for example. In one bag embodiment of this invention, the inner, outer and intermediate layers were formed with thicknesses of about 0.5-1.0 mil (12.7-25.4 μm), 1.5 mil (38.1 μm) and 0.5 mil (12.7 μm), respectively.

Referring to Figures 1 and 5-9, apparatus 20 is adapted to evacuate bag 21 and then seal overlying panels 22 and 23 of the bag together. The panels define an evacuative chamber therebetween adapted to retain a packaged product. As described above, the bag defines overlying heat sealable panel portions terminating at an open end 24 of the bag, communicating with the chamber. The apparatus comprises a base 32 defining an upper support surface thereon adapted to receive the open end and sealable panel portions of the bag thereon (Figure 8).

A hood 33 is pivotally mounted on the base and moveable to a closed position (Figures 1 and 7) to position a frontal side of the hood over the open end and sealable panel portions of the bag. The base defines a first chamber portion or trough 34 of a composite vacuum chamber adapted to receive the open end of the bag in exposed relationship thereto. The trough also functions to collect liquids and powder particles that are exhausted from the bag to prevent their ingress into a vacuum pump 53, described more fully hereinafter. As further described hereinafter, a static sealing means 35 circumvents and seals the vacuum chamber and directly engages outer surfaces of the sealable panel portions of the bag (Figures 4 and 7) in response to movement of the hood to its closed position.

The sealing means thus forms a static seal isolating the open end of the bag and the vacuum chamber from ambient and maintains the open end of the bag in communication with the evacuative chamber of the bag, via open channels 26, in the

manner described above (Figure 4). An evacuation system (Figure 10) is provided to communicate with the vacuum chamber to selectively evacuate the bag. The drawing of a vacuum in the chamber will create a differential pressure on opposite sides of hood 33 to draw the hood towards base 32, aiding in the sealing function. A heat sealing system is also provided for forming an airtight heat seal across the sealable panel portions of the bag to maintain the vacuum within the evacuative chamber of the bag for product storage purposes.

Detail Description

As shown in Figures 1 and 7-9, base 32 comprises a moldable plastic housing 38 suitably constructed to retain various working components of the apparatus therein. Vacuum chamber portion or trough 34 is defined on a frontal side of the base to extend substantially the full length thereof. When a vacuum is drawn in the processed bag, liquid droplets or powdered particles will drop into the trough to prevent damage to a vacuum pump. Sealing means 35 comprises a continuous elastomeric seal 39 suitably secured on the base to completely circumvent trough 34.

As shown in Figures 6 and 7, the composite vacuum chamber further comprises a second chamber portion 40 defined in hood 33 to overlie trough 34. Chamber portion 40 is defined by a pair of longitudinally extending and parallel side walls 41 and 42 and a top wall 43 of the hood. Side walls 41 and 42, as well as the top wall, are reinforced by transversely extending and longitudinally spaced cross-struts 44 formed integrally with plastic molded hood 33.

Intermediate struts 44 are recessed within chamber portion 40 (Figure 7) whereas the bottom edges of a pair of end struts 45 and 46 (Figure 6) lie in the same flat plane at the bottom edges of side walls 41 and 42. Thus, when the hood is in its closed position, the bottom edges of side walls 41 and 42 (preferably aided by an optional seal 49) and end struts 45 and 46 will compress bag 21 against the entire upper surface of seal 39 in circumventing relationship about the vacuum chamber to form a static seal isolating the open end of the bag and the vacuum chamber from ambient (Figure 7).

As shown in Figure 4, when the hood compresses against upper panel 23 of the bag to form a static seal thereat, intercommunicating channels 26 will remain open for evacuation purposes. Interconnected and raised ridges 47 are formed on the outer side of panel 22 to define a plurality of non-intercommunicating, closed cavities 48 between the ridges. Thus, when the ridges are compressed against seal 39, the vacuum chamber will be com-

pletely isolated from ambient. In the preferred embodiment of this invention, sealing means 35 further includes an additional elongated elastomeric seal 49, suitably secured on the underside of hood 33 to fully overlie the frontal portion of seal 39 (Figures 6 and 7).

As shown Figures 7-9, a heat sealing means comprises a low voltage heating element 50 suitably secured forwardly on base 32 and a step-down transformer 63 (Figure 9 and 10) for stepping down the voltage from 115v. to 12-18v. A light 57 is mounted on the hood to indicate heat sealing. The heating element extends substantially the full length of the base and past the ends of the vacuum chamber to insure full sealing across the full width of the bag, draped over the heating element.

If so desired, a Teflon (polytetrafluoroethylene) tape 51 can be suitably secured over the heating element to insure non-adherence of the bag thereto. A longitudinally extending elastomeric pressure profile 52 is suitably secured on a frontal and underside of hood 33 (Figures 6 and 7) to insure application of adequate pressure of the bag over the heating element and full sealing of heat sealable layers 27, 28 together via heat conduction through layers 29 and 31. (Figure 4).

Referring to Figures 9 and 10, the evacuation system further comprises a standard vacuum pump 53 communicating with the vacuum chamber via a plastic tube 54. A second tube 55 (Figures 9 and 10) is interconnected between the vacuum pump and a vacuum indicator 56. An elongated pin 58, suitably molded beneath hood 33 (Figure 6), is positioned over a normally open electrical switch 59, mounted in base 32, whereby closing of the hood will engage the pin with the switch to close the switch to activate a motor 60 connected to pump 53 (Figure 10).

As shown in Figure 9, the rotating output shaft of the motor is suitably connected to an eccentric 61 to reciprocate a piston rod 62 of the standard pump in response to rotation of the eccentric. Since evacuation pumps and drive mechanisms of this type are well known in the art, further detailed description thereof is deemed unnecessary for a full understanding of this invention. The capacity of the pump may be in the range of 1.7 CFM.

A vent hole 65 (Figures 6 and 10) is formed through hood 33 to normally vent the vacuum chamber to ambient. When the hood is closed to initiate a vacuum operation via closed switch 59, the operator will then depress a button 66 to close a normally open poppet valve 67 and thus close vent hole 65. The vacuum is then drawn in the vacuum chamber and within the evacuative chamber of the processed bag with vacuum indicator 56 indicating that the vacuum chamber is being evacuated with a full static seal being maintained across

the bag by the above described sealing means.

After the bag has been fully evacuated, a second button 68 is depressed on the opposite end of the hood to energize heating element 50 (Figure 10). The standard button-switch is normally spring-biased to its raised and open position and has an elongated pin 69 (Figure 6) secured thereunder. The pin is reciprocally mounted in the hood to engage and close a switch 70 (Figures 8 and 10) mounted on base 32. The switch is suitably connected to transformer 63 to electrically energize the heating element to its predesigned temperature level whereby the bag will be fully sealed. A suitably selected amperometric thermo cut-out switch 72 interrupts the power supply to the apparatus upon completion of the seal. Light 57 is mounted on the hood to display energization of heating element 50.

The electrical and pneumatic control circuits for the apparatus can further include various additional standard control devices, well known to those skilled in the art, to enhance the versatility and ease of operation of the apparatus. For example, the circuits can further include a standard electronic adjustable sealer timer to replace amperometric thermo cut-out switch 72, an electrically actuated valve in parallel with pump motor 60 connecting the vacuum side of pump 53 to atmospheric to replace the valve 67, an opening in base 32 and an electrically actuated poppet valve to replace valve 67, a pair of standard thermo-protectors for pump motor 60 and transformer 63, a vacuum actuated adjustable microswitch for automatic heat sealing to replace switch 70 or in parallel with switch 70, a double pump and a vacuum activated valve switching the pumps from parallel to serial at a predetermined vacuum to increase speed of evacuation and maximum achievable vacuum, an electrically or vacuum activated mechanism to lower hood 33, and/or a remote (foot) control, electric or pneumatic, for hands-off operation.

Figure 11 illustrates a modified and self-contained vacuum sealing apparatus 20a wherein identical numerals depict corresponding components and constructions, but with numerals appearing in Figure 11 being accompanied by an "a." Apparatus 20a is elongated to generally take the form of apparatus 20 (Figure 1). Apparatus 20a comprises a hood 33a that contains working components of the apparatus.

The hood is pivotally mounted on a base 32a by a pair of longitudinally spaced pins 75 (one shown) with a torsion spring 76 being mounted on each pin to normally bias the hood to its open position. A similar arrangement could be used to pivotally mount hood 33 on base 32 of apparatus 20. The hood can be detached from the base and

used as an independent unit for vacuum sealing bags, such as by placing it on a counter top, table or the like that would provide a suitable support surface therefor.

The vacuum chamber defined between the hood and the base comprises a first chamber portion or trough 34a defined in the base and a second chamber portion 40a defined in the hood to overlie trough 34a. A continuous elastomeric seal 39a, similar to seal 39, is secured on an underside of the hood to extend entirely about the periphery of the vacuum chamber. The seal is adapted to directly engage flat and uninterrupted upper surface portions of base 32a (or the flat surface of a counter top or the like when the hood is used as an independent unit) to isolate open end 24 of bag 21 and the vacuum chamber from ambient. A vacuum pump 53a of the type described above, communicates with a tube 54a having its open end exposed to the vacuum chamber to draw a vacuum therein. The drawing of a vacuum in the chamber will create a differential pressure on opposite sides of the hood to aid in the static sealing of the chamber and bag 21.

After the bag has been evacuated, an electrically energized heating element 50a, mounted beneath the frontal side of the hood, is activated to form a heat seal entirely across the open end of the bag. After the bag has been evacuated, a standard vacuum responsive plunger 68a is drawn downwardly to its position illustrated in Figure 11 to close a normally open switch 70a via a reciprocal switch actuating member or arm 69a. Closing of the switch will energize the heating element in much the same manner as described above.

The control circuit for apparatus 20a may be generally of the type illustrated in Figure 10, including utilization of vacuum indicator 56 and light 57. The self-contained apparatus includes the appropriate number of standard rechargeable (12v.DC and/or 115v.AC) NiCad batteries 63a and associated standard circuitry to provide the power source for the vacuum pump and heat sealer. Apparatus 20a is adapted to be wall-mounted and is further adapted as a portable self-contained unit for use in recreational environments and the like.

Figures 12-19 illustrate a lid attachment 77 for a container 78 adapted for connection to the vacuum chamber of apparatus 20 for the purpose of selectively evacuating the container. The lid attachment comprises an annular lid adapter 79 and an annular elastomeric seal 80 secured thereunder to form a static seal at an upper flange 81 of container 78. The lid attachment further comprises an annular connector 82 having an annular elastomeric seal 83 secured thereunder to engage a radially outer surface of an annular ridge 84 formed on lid adapter 79.

A flexible plastic tube 85 is attached between connector 82 and an opening 86, formed through the top panel of hood 33 (Figure 12). As schematically illustrated in Figure 10, a normally closed standard poppet valve 87 is opened when a standard fitting, secured to an end of tube 85, is depressed within opening 86. The mounting of the valve on the hood is further shown in Figure 6.

Referring to Figures 14-19, a thumb-nut 88 is threaded onto a neck 89, formed centrally on lid adapter 79. As illustrated, an indicia marking in the form of an arrow 90 is formed on the thumb-nut to visually indicate one of three operative positions of the thumb-nut, i.e., "vacuum", "closed", or "open" as marked on lid adapter 79. When the thumb-nut is rotated to its "vacuum" position illustrated in Figures 14 and 15, a user is enabled to close hood 33 on base 32 of apparatus 20 and press button 66 to draw a vacuum in container 78.

In particular, a plastic disc 91 is "loosely" mounted within thumb-nut 88 and forms a valve element that openly communicates the vacuum drawn in tube 85 (Figures 12 and 13) with the container. The vacuum is drawn across a transverse slot 92 formed in the upper surface of the disc and through a centrally disposed passage 93, formed through neck 89. The applied vacuum will induce a lifting of disc 91, which overlies passage 93, to aid in expeditious evacuation.

A plurality of radially and circumferentially spaced hook-like fingers or retention members 94 are formed integrally with the disc in upstanding relationship thereon to extend through a mounting hole and overlie a flange 95 defined on the thumb-nut for retention purposes. The retention members are sufficiently flexible and resilient to permit a snapping-out of the members from their mounting hole, formed centrally through the thumbnut. It should be noted in Figure 15 that a flexible detent 96 is formed integrally on a side wall or skirt of the thumb nut to extend radially inwardly to releasably engage within a groove 97, formed on the outer side of neck 89.

This detent arrangement will releasably retain the thumb nut in its illustrated "vacuum" position in Figure 14. A similar detent arrangement is also provided for releasably holding the thumb screw in each of its "closed" (Figures 16 and 17) and "open" (Figures 18 and 19) positions. Otherwise stated, three circumferentially spaced (120° apart) detents 96 and their associated grooves 97 are formed on the thumb screw and neck for this purpose. It should be noted that during evacuation of container 78 the large chamber and reservoir defined between lid adapter 79 and connector 82 will collect and prevent liquids and powders, drawn from the container, from entering tube 85.

After the container has been evacuated, connector 82 is removed and thumb nut 88 is turned-down to its "closed" position illustrated in Figures 16 and 17 to compress the flat underside of disc 91 against an O-ring seal 98, mounted on neck 89 to surround passage 93. When the connector is removed, the vacuum in the container will pull disc against seal 98 to retain the vacuum until the thumbnut is turned-down. An annular bead 99 is formed beneath flange 95 of the thumb nut to engage the upper side of disc 91 to compress it against the seal. Diametrically extending and narrow slot 92 will not interfere with this closing function.

When the user chooses to release the vacuum in the container, thumb nut 88 is released to its Figures 18 and 19 position whereby flange 95 will engage beneath the hook ends of retention members 94 to raise disc 91 from seal 98. Air is thus permitted to ingress into the container via slot 92 and passage 93.

Claims

1. An apparatus (20;20a) for vacuum sealing a plastic bag (21) having overlying first and second panels (22,23) defining an evacuative chamber and overlying heat sealable panel portions terminating at an open end (24) of said bag (21) communicating with said evacuative chamber, at least one of the overlying heat sealable panel portions having intercommunicating channels (26) for maintaining the open end of said bag (21) in communication with the evacuative chamber of said bag (21) for evacuation purposes, said apparatus (20;20a) comprising:

a hood (33;33a) movable to a closed position on a support surface to position a frontal side thereof over the open end and sealable panel portions of said bag (21), said hood (33;33a) at least in part defining a vacuum chamber means (40;40a) when said hood (33;33a) is moved to the closed position on the support surface,

said vacuum chamber means (40;40a) having a width extending from a frontal side of said hood (33;33a) which is sized to exclusively receive the open end of said bag (21) in exposed relationship therein and to position the remaining portions of said bag (21) exteriorly of said apparatus (20;20a),

static seal means (35;39a) mounted beneath said hood (33;33a) and circumventing said vacuum chamber means (40;40a) for statically sealing said vacuum chamber means (40;40a) from ambient when said hood (33;33a) is in its closed position,

said static seal means (35;39a) circumventing the vacuum chamber means (40;40a) directly engaging outer surfaces of the sealable panel portions of said bag (21) in response to movement of said hood (33;33a) to its closed position for isolating both the open end of said bag (21) and said vacuum chamber means (40;40a) from ambient, and said static seal means (35;39a) maintaining the open end of said bag (21) in communication (26) with the evacuative chamber thereof,

evacuation means (53,54;53a,54a) communicating with said vacuum chamber means (40;40a) for selectively evacuating said vacuum chamber means (40;40a) and the evacuative chamber of said bag (21), and

heat sealing means, including a heating element (50;50a) mounted forwardly on said apparatus (20;20a), for selectively forming an air-tight heat seal across the sealable panel portions of said bag (21) to maintain said vacuum within the evacuative chamber of said bag (21).

2. The apparatus of claim 1, characterized in further comprising

a base (32;32a) defining said support surface to receive the open end and sealable panel portions of said bag (21) therein, said hood (33;33a) being mounted on said base (32;32a),

said hood (33;33a) and base (32;32a) defining said vacuum chamber means (40;40a) therebetween.

3. The apparatus of claim 2, characterized in that said hood (33;33a) is pivotally mounted on said base (32;32a).

4. The apparatus of claim 2, characterized in that said vacuum chamber means (40;40a) comprises trough means (34;34a) defined on said base (32;32a) for collecting liquids and particles therein during vacuum sealing of said bag (21).

5. The apparatus of claim 4, characterized in that said vacuum chamber means further comprises a chamber portion (40;40a) defined in an underside of said hood (33;33a) to overlie said trough means (34;34a).

6. The apparatus of claim 5, characterized in that said evacuation means (53,54;53a,54a) comprises a tube (54;54a) having its distal end mounted in said hood (33;33a) in communication with the chamber portion (40;40a) of said vacuum chamber.

After the container has been evacuated, connector 82 is removed and thumb nut 88 is turned-down to its "closed" position illustrated in Figures 16 and 17 to compress the flat underside of disc 91 against an O-ring seal 98, mounted on neck 89 to surround passage 93. When the connector is removed, the vacuum in the container will pull disc against seal 98 to retain the vacuum until the thumbnut is turned-down. An annular bead 99 is formed beneath flange 95 of the thumb nut to engage the upper side of disc 91 to compress it against the seal. Diametrically extending and narrow slot 92 will not interfere with this closing function.

When the user chooses to release the vacuum in the container, thumb nut 88 is released to its Figures 18 and 19 position whereby flange 95 will engage beneath the hook ends of retention members 94 to raise disc 91 from seal 98. Air is thus permitted to ingress into the container via slot 92 and passage 93.

Claims

1. An apparatus (20;20a) for vacuum sealing a plastic bag (21) having overlying first and second panels (22,23) defining an evacuative chamber and overlying heat sealable panel portions terminating at an open end (24) of said bag (21) communicating with said evacuative chamber, at least one of the overlying heat sealable panel portions having intercommunicating channels (26) for maintaining the open end of said bag (21) in communication with the evacuative chamber of said bag (21) for evacuation purposes, said apparatus (20;20a) comprising:

a hood (33;33a) movable to a closed position on a support surface to position a frontal side thereof over the open end and sealable panel portions of said bag (21), said hood (33;33a) at least in part defining a vacuum chamber means (40;40a) when said hood (33;33a) is moved to the closed position on the support surface,

said vacuum chamber means (40;40a) having a width extending from a frontal side of said hood (33;33a) which is sized to exclusively receive the open end of said bag (21) in exposed relationship therein and to position the remaining portions of said bag (21) exteriorly of said apparatus (20;20a),

static seal means (35;39a) mounted beneath said hood (33;33a) and circumventing said vacuum chamber means (40;40a) for statically sealing said vacuum chamber means (40;40a) from ambient when said hood (33;33a) is in its closed position,

said static seal means (35;39a) circumventing the vacuum chamber means (40;40a) directly engaging outer surfaces of the sealable panel portions of said bag (21) in response to movement of said hood (33;33a) to its closed position for isolating both the open end of said bag (21) and said vacuum chamber means (40;40a) from ambient, and said static seal means (35;39a) maintaining the open end of said bag (21) in communication (26) with the evacuative chamber thereof,

evacuation means (53,54;53a,54a) communicating with said vacuum chamber means (40;40a) for selectively evacuating said vacuum chamber means (40;40a) and the evacuative chamber of said bag (21), and

heat sealing means, including a heating element (50;50a) mounted forwardly on said apparatus (20;20a), for selectively forming an air-tight heat seal across the sealable panel portions of said bag (21) to maintain said vacuum within the evacuative chamber of said bag (21).

2. The apparatus of claim 1, characterized in further comprising

a base (32;32a) defining said support surface to receive the open end and sealable panel portions of said bag (21) therein, said hood (33;33a) being mounted on said base (32;32a),

said hood (33;33a) and base (32;32a) defining said vacuum chamber means (40;40a) therebetween.

3. The apparatus of claim 2, characterized in that said hood (33;33a) is pivotally mounted on said base (32;32a).

4. The apparatus of claim 2, characterized in that said vacuum chamber means (40;40a) comprises trough means (34;34a) defined on said base (32;32a) for collecting liquids and particles therein during vacuum sealing of said bag (21).

5. The apparatus of claim 4, characterized in that said vacuum chamber means further comprises a chamber portion (40;40a) defined in an underside of said hood (33;33a) to overlie said trough means (34;34a).

6. The apparatus of claim 5, characterized in that said evacuation means (53,54;53a,54a) comprises a tube (54;54a) having its distal end mounted in said hood (33;33a) in communication with the chamber portion (40;40a) of said vacuum chamber.



7. The apparatus of claim 4, characterized in that said static seal means (35;39a) comprises a continuous elastomeric seal (39;39a) secured on said base (32;32a) to completely circumvent said trough means (34;34a).
8. The apparatus of claim 7, characterized in that said static seal means (35) further comprises a plurality of walls (41,42) formed on an underside of said hood (33) to overlie and have bottom edges thereof engage and compress against said elastomeric seal (39) to form a static seal around said vacuum chamber means (40) when said hood (33) is moved to its closed position on said base (32).
9. The apparatus of claim 8, characterized in that said static seal means (35) further comprises an elongated elastomeric seal (49) secured on the underside of said hood (33) to overlie and engage a frontal portion of said first-mentioned elastomeric seal (39) when said hood (33) is moved to its closed position on said base (32).
10. The apparatus of claim 2, characterized in that said static seal means (35;39a) comprises a continuous elastomeric seal (39;39a) secured on an underside of said hood (33;33a) to extend about the periphery of said vacuum chamber means (40;40a) and to engage an upper surface of said base (32;32a) to form a static seal thereat when said hood (33;33a) is moved to its closed position on said base (32;32a).
11. The apparatus of claim 2, characterized in further comprising vent means (65,67) for normally venting said vacuum chamber means (40) to ambient and closing means (66) for selectively closing said vent means (65,67) to isolate said vacuum chamber means (40) from ambient.
12. The apparatus of claim 11, characterized in that said vent means (65,67) comprises a normally open poppet valve (67) mounted on said hood (33) and means (66) mounted on said hood (33) for selectively closing said poppet valve (67).
13. The apparatus of claim 11, characterized in that said evacuation means (53,54) comprises vacuum pump means (53) for selectively drawing a vacuum in said vacuum chamber means (40), tube means (54) for communicating said vacuum pump means (53) with said vacuum chamber means (40) and control means (58,59) for activating said vacuum pump

means (53) in response to movement of said hood (33) to its closed position on said base (32).

14. The apparatus of claim 13, characterized in that said control means (58,59) comprises a normally open switch (59) mounted on said base (32) and a pin means (58) secured on an underside of said cover for engaging and closing said switch (59) when said hood (33) is moved to its closed position on said base (32).
15. The apparatus of claim 11, characterized in that said heat sealing means (50) further comprises an electrical power source (63) and switch means (70) for selectively connecting said power source (63) to said heating element (50).
16. The apparatus of claim 15, characterized in that said switch means (70) comprises a normally open switch (70) mounted on said base (32) and means (68,69) mounted on said hood (33) for closing said switch means (70) when said hood (33) is in its closed position on said base (32).
17. The apparatus of claim 2, characterized in that said heating element (50) is mounted forwardly of said static sealing means (35) on said base (32).
18. The apparatus of claim 2, characterized in that said heating element (50;50a) is mounted forwardly of said static sealing means (35;35a) on said hood (33;33a).
19. The apparatus of claim 2, characterized in further comprising lid attachment means (77) for attachment to a container (78), and connection means (85) interconnected between the vacuum chamber means (40) of said apparatus (20) and said lid attachment (77) for selectively drawing a vacuum through said lid attachment (77) and from within said container (78) in response to activation of said evacuation means (53,54).
20. The apparatus of claim 19, characterized in that said lid attachment means (77) comprises a lid adapter (79) having a passage (93) formed therethrough and first sealing means (80) secured thereunder for forming a static seal when it is mounted on said container (78), a connector (82), second sealing means (83) for forming a static seal between said lid adapter (79) and said connector (82) when said connector is mounted on said lid adapter (79),



and means (88) mounted on said lid adapter (79) for movement between a first position openly communicating said passage (93) with said container (78), a second position for forming a third sealing means closing said passage (93) to seal said container (78) and a third position for opening said passage (93) to communicate said container (78) with ambient to release the vacuum therein.

21. The apparatus of claim 1, characterized in that said heating element (50a) is mounted forwardly on and beneath said hood (33a).
22. The apparatus of claim 1, characterized in that said evacuation means (53a, 54a) comprises a tube (54a) having its distal end mounted in said hood (33a) in communication with said vacuum chamber means (44a).
23. The apparatus of claim 1, characterized in that said static seal means (39a) comprises a continuous elastomeric seal (39a) secured on an underside of said hood (33a) to extend about the periphery of said vacuum chamber means (40a) and to engage said support surface to form a static seal thereat when said hood (33a) is moved to its closed position on said support surface.

Patentansprüche

1. Vorrichtung (20; 20a) zum Vakuumschweißen eines Plastikbeutels (21), der überlappende erste und zweite Bahnen (22, 23) hat, welche eine zu evakuierende Kammer definieren sowie überlappende Bahnteile zum Heisssschweißen, die bei einem offenen Ende (24) des Beutels (21) enden und mit der zu evakuierenden Kammer verbunden sind, wobei mindestens eine der überlappenden Bahnteile zum Heisssschweißen miteinander verbundene Kanäle (26) aufweist, um die Verbindung zwischen dem offenen Ende des Beutels (21) und der zu evakuierenden Kammer des Beutels (21) zum Zwecke des Evakuierens aufrecht zu halten, wobei die Vorrichtung (20; 20a) umfasst:
 - eine Haube (33; 33a), die in eine geschlossene Position auf einer Stützfläche bewegt werden kann, um eine Vorderseite davon über dem offenen Ende und den Bahnteilen zum Heisssschweißen des Beutels (21) zu positionieren, wobei die Haube (33; 33a) mindestens teilweise eine Vakuumkammer-Einrichtung (40; 40a) definiert, wenn die Haube (33; 33a) in die geschlossene Position auf der Stützfläche bewegt wird,
 - wobei die Vakuumkammer-Einrichtung (40;

40a) eine Breite hat, die von einer Vorderseite der Haube (33; 33a) ausgeht, welche eine Grösse hat, um ausschliesslich das offene Ende des Beutels (21) ungeschützt darin aufzunehmen und die übrigen Teile des Beutels (21) ausserhalb der Vorrichtung (20; 20a) anzuordnen,

eine statische Dichtungseinrichtung (35; 39a), die unter der Haube (33; 33a) montiert ist und die, Vakuumkammer-Einrichtung (40; 40a) umgibt, um die Vakuumkammer-Einrichtung (40; 40a) statisch von der Umgebung abzudichten, wenn sich die Haube (33; 33a) in ihrer geschlossenen Position befindet,

wobei die statische Dichtungseinrichtung (35; 39a), welche die Vakuumkammer-Einrichtung (40; 40a) umgibt, als Reaktion auf die Bewegung der Haube (33; 33a) zu ihrer geschlossenen Position, direkt die äusseren Oberflächen der Bahnteile zum Heisssschweißen des Beutels (21) berührt, um sowohl das offene Ende des Beutels (21) als auch die Vakuumkammer-Einrichtung (40; 40a) von der Umgebung zu isolieren, und die statische Dichtungseinrichtung (35; 39a) die Verbindung (26) zwischen dem offenen Ende des Beutels (21) und der zu evakuierenden Kammer davon aufrecht erhält,

eine Evakuierereinrichtung (53, 54; 53a, 54a), die mit der Vakuumkammer-Einrichtung (40; 40a) verbunden ist, um wahlweise die Vakuumkammer-Einrichtung (40; 40a) und die zu evakuierende Kammer des Beutels (21) zu evakuieren, und

eine Einrichtung zum Heisssschweißen, die ein Heizelement (50; 50a) umfasst, das vorne auf der Vorrichtung (20; 20a) montiert ist, um wahlweise eine luftdichte Heissverschweissung durch die Bahnteile zum Heisssschweißen des Beutels (21) zu bilden, um das Vakuum in der zu evakuierenden Kammer des Beutels (21) aufrecht zu halten.

2. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, dass sie weiter umfasst
 - eine Grundeinrichtung (32; 32a), welche die Stützfläche definiert, um das offene Ende und die Bahnteile zum Heisssschweißen des Beutels (21) darauf aufzunehmen, wobei die Haube (33; 33a) an der Grundeinrichtung (32; 32a) montiert ist,
 - wobei die Haube (33; 33a) und die Grundeinrichtung (32; 32a) zwischen sich die Vakuumkammer-Einrichtung (40; 40a) definieren.
3. Vorrichtung nach Anspruch 2, dadurch gekennzeichnet, dass die Haube (33; 33a) schwenkbar an der Grundeinrichtung (32; 32a) montiert ist.



4. Vorrichtung nach Anspruch 2, dadurch gekennzeichnet, dass die Vakuunkammer-Einrichtung (40; 40a) eine Trogeinrichtung (34; 34a) umfasst, die auf der Grundeinrichtung (32; 32a) definiert ist, um während dem Vakuumschweissen des Beutels (21) Flüssigkeiten und Partikel darin zu sammeln.

5. Vorrichtung nach Anspruch 4, dadurch gekennzeichnet, dass die Vakuunkammer-Einrichtung weiter einen Kammerteil (40; 40a) umfasst, der in einer Unterseite der Haube (33; 33a) definiert ist, um die Trogeinrichtung (34; 34a) zu überlappen.

6. Vorrichtung nach Anspruch 5, dadurch gekennzeichnet dass die Evakuierereinrichtung (53, 54; 53a, 54a) einen Schlauch (54; 54a) umfasst, der sein fernes Ende in der Haube (33; 33a) montiert hat, und der mit dem Kammerteil (40; 40a) der Vakuunkammer verbunden ist.

7. Vorrichtung nach Anspruch 4, dadurch gekennzeichnet, dass die statische Dichtungseinrichtung (35; 39a) eine ununterbrochene elastische Dichtung (39; 39a) umfasst, die an der Grundeinrichtung (32; 32a) befestigt ist, um die Trogeinrichtung (34; 34a) vollständig zu umgeben.

8. Vorrichtung nach Anspruch 7, dadurch gekennzeichnet, dass die statische Dichtungseinrichtung (35) weiter eine Vielzahl von Wänden (41, 42) umfasst, die auf einer Unterseite der Haube (33) ausgebildet sind, um die elastische Dichtung (39) zu überlappen und mit den unteren Ränder der Wände die elastische Dichtung (39) zu berühren und gegen sie zu pressen, damit eine statische Dichtung um die Vakuunkammer-Einrichtung (40) gebildet wird, wenn die Haube (33) in ihre geschlossene Position auf der Grundeinrichtung (32) bewegt wird.

9. Vorrichtung nach Anspruch 8, dadurch gekennzeichnet, dass die statische Dichtungseinrichtung (35) weiter eine längliche elastische Dichtung (49) umfasst, die an der Unterseite der Haube (33) befestigt ist, um einen vorderen Teil der zuerst erwähnten elastischen Dichtung (39) zu überlappen und zu berühren, denn die Haube (33) in ihre geschlossene Position auf der Grundeinrichtung (32) bewegt wird.

10. Vorrichtung nach Anspruch 2, dadurch gekennzeichnet, dass die statische Dichtungseinrichtung (35; 39a) eine ununterbrochene elastische Dichtung (39; 39a) umfasst, die an einer Unterseite der Haube (33; 33a) befestigt ist, um sich

über den Umfang der Vakuunkammer-Einrichtung (40; 40a) zu erstrecken und um eine obere Oberfläche der Grundeinrichtung (32; 32a) zu berühren, damit daselbst eine statische Dichtung gebildet wird, wenn die Haube (33; 33a) in ihre geschlossene Position auf der Grundeinrichtung (32; 32a) bewegt wird.

11. Vorrichtung nach Anspruch 2, dadurch gekennzeichnet, dass sie weiter eine Entlüftungseinrichtung (65, 67) umfasst, um die Vakuunkammer-Einrichtung (40) auf gebräuchliche Art und Weise gegen die Umgebung zu entlüften, sowie eine Schliesseinrichtung (66), um wahlweise die Entlüftungseinrichtung (65, 67) zu schliessen, damit die Vakuunkammer-Einrichtung (40) von der Umgebung isoliert wird.

12. Vorrichtung nach Anspruch 11 dadurch gekennzeichnet, dass die Entlüftungseinrichtung (65, 67) ein normalerweise offenes Tellerventil (67) umfasst, das, an der Haube (33) montiert ist, sowie eine Einrichtung (66), die an der Haube (33) montiert ist, um wahlweise das Tellerventil (67) zu schliessen.

13. Vorrichtung nach Anspruch 11, dadurch gekennzeichnet, dass die Evakuierereinrichtung (53, 54) eine Vakuumpumpen-Einrichtung (53) umfasst, um wahlweise ein Vakuum in der Vakuunkammer-Einrichtung (40) zu erzeugen, eine Schlaucheinrichtung (54), um die Vakuumpumpen-Einrichtung (53) mit der Vakuunkammer-Einrichtung (40) zu verbinden, und eine Steuereinrichtung (58, 59), um die Vakuumpumpen-Einrichtung (53) zu aktivieren sobald die Haube (33) in ihre geschlossene Position auf der Grundeinrichtung (32) bewegt wird.

14. Vorrichtung nach Anspruch 13, dadurch gekennzeichnet, dass die Steuereinrichtung (58, 59) einen normalerweise offenen Schalter (59) umfasst, der an der Grundeinrichtung (32) montiert ist, sowie eine Stifteinrichtung (58), die an einer Unterseite der Abdeckung befestigt ist, um den Schalter (59) zu berühren und zu schliessen, wenn die Haube (33) in ihre geschlossene Position auf der Grundeinrichtung (32) bewegt wird.

15. Vorrichtung nach Anspruch 11, dadurch gekennzeichnet, dass die Einrichtung (50) zum Heisschweissen weiter eine elektrische Stromquelle (63) umfasst sowie eine Schaltungseinrichtung (70), um die Stromquelle (63) wahlweise mit dem Element (50) zum Heisschweissen zu verbinden.



16. Vorrichtung nach Anspruch 15, dadurch gekennzeichnet, dass die Schaltungseinrichtung (70) einen normalerweise offenen Schalter (70) umfasst, der an der Grundeinrichtung (32) montiert ist, sowie eine Einrichtung (68, 69), die an der Haube (33) montiert ist, um die Schaltungseinrichtung (70) zu schliessen, wenn die Haube (33) in ihrer geschlossenen Position auf der Grundeinrichtung (32) ist.
17. Vorrichtung nach Anspruch 2, dadurch gekennzeichnet, dass das Heizelement (50) vor der statischen Dichtungseinrichtung (35) auf der Grundeinrichtung (32) montiert ist.
18. Vorrichtung nach Anspruch 2, dadurch gekennzeichnet, dass das Heizelement (50; 50a) vor der statischen Dichtungseinrichtung (35; 35a) auf der Haube (33; 33a) montiert ist.
19. Vorrichtung nach Anspruch 2, dadurch gekennzeichnet, dass sie weiter eine Einrichtung (77) für eine Deckelbefestigung für eine Befestigung an einem Behälter (78) umfasst, sowie eine Verbindungseinrichtung (85), welche mit der Vakuumkammer-Einrichtung (40) der Vorrichtung (20) und der Einrichtung (77) für eine Deckelbefestigung verbunden ist, um in Abhängigkeit der Betätigung der Evakuierereinrichtung (53, 54) wahlweise durch die Deckelbefestigung (77) im Innern des Behälters (78) ein Vakuum zu erzeugen.
20. Vorrichtung nach Anspruch 19, dadurch gekennzeichnet, dass die Einrichtung (77) für eine Deckelbefestigung einen Deckeladapter (79) umfasst, der einen Durchgang (93) durch ihn hindurch ausgebildet hat sowie eine erste Dichtungseinrichtung (80), die darunter befestigt ist, um eine statische Dichtung zu bilden, wenn er am Behälter (78) montiert ist, einen Anschluss (82), eine zweite Dichtungseinrichtung (83), um eine statische Dichtung zwischen dem Deckeladapter (79) und dem Anschluss (82) zu bilden, wenn der Anschluss am Deckeladapter (79) montiert ist, und eine Einrichtung (88), die am Deckeladapter (79) montiert ist, um zwischen einer ersten Position, in welcher der Durchgang (93) offen mit dem Behälter (78) verbunden ist, einer zweiten Position, um eine dritte Dichtungseinrichtung zu bilden, die den Durchgang (93) schliesst, um den Behälter (78) abzudichten, und einer dritten Position, um den Durchgang (93) zu öffnen, damit der Behälter (78) mit der Umgebung verbunden wird und das darin enthaltene Vakuum aufgefüllt wird, hin und her bewegt zu werden.

21. Vorrichtung nach Anspruch 1; dadurch gekennzeichnet, dass das Heizelement (50a) vorne unten an der Haube (33a) montiert ist.

22. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, dass die Evakuierereinrichtung (53a, 54a) einen Schlauch (54a) umfasst, der sein fernes Ende in der Haube (33a) montiert hat, und der mit der Vakuumkammer-Einrichtung (40a) verbunden ist.

23. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, dass die statische Dichtungseinrichtung (39a) eine ununterbrochene elastische Dichtung (39a) umfasst, die an einer Unterseite der Haube (33a) befestigt ist, um sich über den Umfang der Vakuumkammer-Einrichtung (40a) zu erstrecken und um die Stützfläche zu berühren, damit daselbst eine statische Dichtung gebildet wird, wenn die Haube (33a) in ihre geschlossene Position auf der Stützfläche bewegt wird.

Revendications

1. Un appareil (20;20a) pour sceller sous vide un sac en plastique (21) ayant un premier et un second panneaux de recouvrement (22,23) définissant une chambre d'évacuation et des portions de panneaux de recouvrement thermoscellables se terminant au niveau d'une extrémité ouverte (24) dudit sac (21) communiquant avec ladite chambre d'évacuation, au moins une des portions de panneaux de recouvrement thermoscellables comportant des canaux communiquant entre eux (26) pour maintenir l'extrémité ouverte dudit sac (21) en communication avec la chambre d'évacuation dudit sac (21) à des fins d'évacuation, ledit appareil (20;20a) comprenant:

un capot (33;33a) mobile jusqu'à une position fermée sur une surface de support pour placer un côté frontal de celui-ci au-dessus de l'extrémité ouverte et des portions de panneaux scellables dudit sac (21), ledit capot (33;33a) définissant au moins en partie un moyen de chambre à vide (40;40a) quand ledit capot (33;33a) est déplacé jusqu'à la position fermée, sur la surface de support,

ledit moyen de chambre à vide (40;40a) ayant une largeur s'étendant à partir d'un côté frontal dudit capot (33;33a) qui est dimensionnée pour recevoir exclusivement l'extrémité ouverte dudit sac (21) dans une relation exposée à l'intérieur de celui-ci et pour placer les portions restantes dudit sac (21) extérieurement audit appareil (20;20a),

un moyen de scellement statique (35;39a)



monté sous ledit capot (33;33a) et entourant ledit moyen de chambre à vide (40;40a) pour sceller statiquement ledit moyen de chambre à vide (40;40a) à partir de l'air ambiant, quand ledit capot (33;33a) est dans sa position fermée,

ledit moyen de scellement statique (35;39a) entourant le moyen de chambre à vide (40;40a) engageant directement les surfaces externes des portions de panneaux scellables dudit sac (21) en réponse au mouvement dudit capot (33;33a) jusqu'à sa position fermée, pour isoler à la fois l'extrémité ouverte dudit sac (21) et ledit moyen de chambre à vide (40;40a) de l'air ambiant, et ledit moyen de scellement statique (35;39a) maintenant l'extrémité ouverte dudit sac (21) en communication (26) avec la chambre d'évacuation de celui-ci,

un moyen d'évacuation (53,54;53a,54a) communiquant avec ledit moyen de chambre à vide (40;40a) pour évacuer sélectivement ledit moyen de chambre à vide (40;40a) et la chambre d'évacuation dudit sac (21), et

un moyen de thermoscellage, comprenant un élément chauffant (50;50a) monté vers l'avant sur ledit appareil (20;20a), pour former sélectivement un joint thermique étanche à l'air en travers des portions de panneaux scellables dudit sac (21) pour maintenir ledit vide à l'intérieur de la chambre d'évacuation dudit sac (21).

2. L'appareil de la revendication 1, caractérisé en ce qu'il comprend en outre,

une base (32;32a) définissant ladite surface de support pour recevoir l'extrémité ouverte et les portions de panneaux scellables dudit sac (21) en son sein, ledit capot (33;33a) étant monté sur ladite base (32;32a),

ledit capot (33;33a) et ladite base (32;32a) définissant ledit moyen de chambre à vide (40;40a) entre eux.

3. L'appareil de la revendication 2, caractérisé en ce que ledit capot (33;33a) est monté en pivotement sur ladite base (32;32a).

4. L'appareil de la revendication 2, caractérisé en ce que ledit moyen de chambre à vide (40;40a) comprend un moyen de dépression (34;34a) défini sur ladite base (32;32a), pour collecter des liquides et des particules en son sein durant le scellement sous vide dudit sac (21).

5. L'appareil de la revendication 4, caractérisé en ce que ledit moyen de chambre à vide com-

prend en outre une portion de chambre (40;40a) définie dans un côté inférieur dudit capot (33;33a) pour recouvrir ledit moyen de dépression (34;34a).

6. L'appareil de la revendication 5, caractérisé en ce que ledit moyen d'évacuation (53,54;53a,54a) comprend un tube (54;54a) ayant son extrémité distale montée dans ledit capot (33;33a), en communication avec la portion de chambre (40;40a) de ladite chambre à vide.

7. L'appareil de la revendication 4, caractérisé en ce que ledit moyen de scellement statique (35;39a) comprend un joint élastomère continu (39;39a) fixé sur ladite base (32;32a) pour entourer complètement ledit moyen de dépression (34;34a).

8. L'appareil de la revendication 7, caractérisé en ce que ledit moyen de scellement statique (35) comprend en outre une pluralité de parois (41,42) formées sur un côté inférieur dudit capot (33), pour recouvrir et avoir les bords inférieurs de celles-ci engagés et comprimés contre ledit joint élastomère (39) pour former un joint statique autour dudit moyen de chambre à vide (40) quand ledit capot (33) est déplacé jusqu'à sa position fermée sur ladite base (32).

9. L'appareil de la revendication 8, caractérisé en ce que ledit moyen de scellement statique (35) comprend en outre un joint élastomère allongé (49) fixé sur le côté inférieur dudit capot (33) pour recouvrir et engager une portion frontale dudit joint élastomère mentionné en premier lieu (39) quand ledit capot (33) est déplacé jusqu'à sa position fermée sur ladite base (32).

10. L'appareil de la revendication 2, caractérisé en ce que ledit moyen de scellement statique (35;39a) comprend un joint élastomère continu (39;39a) fixé sur un côté inférieur dudit capot (33;33a) pour s'étendre autour de la périphérie dudit moyen de chambre à vide (40;40a) et pour engager une surface supérieure de ladite base (32;32a) pour former un joint statique à ce niveau quand ledit capot (33;33a) est déplacé jusqu'à sa position fermée, sur ladite base (32;32a).

11. L'appareil de la revendication 2, caractérisé en ce qu'il comprend en outre un moyen d'évent (65,67) pour normalement dégazer ledit moyen de chambre à vide (40) jusqu'à l'air ambiant et un moyen de fermeture (66) pour fermer sélec-



tivement ledit moyen d'évent (65,67) pour isoler ledit moyen de chambre à vide (40) de l'air ambiant.

12. L'appareil de la revendication 11, caractérisé en ce que ledit moyen d'évent (65,67) comprend une soupape à champignon normalement ouverte (67) montée sur ledit capot (33) et un moyen (66) monté sur ledit capot (33) pour fermer sélectivement ladite soupape à champignon (67). 5
13. L'appareil de la revendication 11, caractérisé en ce que ledit moyen d'évacuation (53,54) comprend un moyen de pompe à vide (53) pour extraire sélectivement un vide dans ledit moyen de chambre à vide (40), un moyen de tube (54) pour faire communiquer ledit moyen de pompe à vide (53) avec ledit moyen de chambre à vide (40) et un moyen de commande (58,59) pour activer ledit moyen de pompe à vide (53) en réponse au mouvement dudit capot (33) jusqu'à sa position fermée sur ladite base (32). 10 15 20 25
14. L'appareil de la revendication 13, caractérisé en ce que ledit moyen de commande (58,59) comprend un commutateur normalement ouvert (59) monté sur ladite base (32) et un moyen de pointe (58) fixé sur un côté inférieur dudit couvercle pour engager et fermer ledit commutateur (59) quand ledit capot (33) est déplacé jusqu'à sa position fermée sur ladite base (32). 30 35
15. L'appareil de la revendication 11, caractérisé en ce que ledit moyen de thermoscellage (50) comprend en outre une source d'alimentation électrique (63) et un moyen de commutateur (70) pour relier sélectivement ladite alimentation (63) audit élément chauffant (50). 40
16. L'appareil de la revendication 15, caractérisé en ce que ledit moyen de commutateur (70) comprend un commutateur normalement ouvert (70) monté sur ladite base (32) et un moyen (68,69) monté sur ledit capot (33) pour fermer ledit moyen de commutateur (70) quand ledit capot (33) est dans sa position fermée sur ladite base (32). 45 50
17. L'appareil de la revendication 2, caractérisé en ce que ledit élément chauffant (50) est monté vers l'avant dudit moyen de scellement statique (35) sur ladite base (32). 55
18. L'appareil de la revendication 2, caractérisé en ce que ledit élément chauffant (50;50a) est

monté vers l'avant, dudit moyen de scellement statique (35;35a) sur ledit capot (33;33a).

19. L'appareil de la revendication 2, caractérisé en ce qu'il comprend en outre un moyen de fixation d'un couvercle (77) pour une fixation à un conteneur (78) et un moyen de connection (85) relié entre le moyen de chambre à vide (40) dudit appareil (20) et ladite fixation du couvercle (77) pour extraire sélectivement un vide à travers ladite fixation du couvercle (77) et à partir de l'intérieur dudit conteneur (78), en réponse à l'activation dudit moyen d'évacuation (53,54). 10 15 20 25
20. L'appareil de la revendication 19, caractérisé en ce que ledit moyen de fixation du couvercle (77) comprend un adaptateur de couvercle (79) ayant un passage (93) formé à travers lui et un premier moyen de scellement (80) fixé sous ce dernier pour former un joint statique quand il est monté sur ledit conteneur (78), un connecteur (82), un second moyen de scellement (83) pour former un joint statique entre ledit adaptateur de couvercle (79) et ledit connecteur (82), quand ledit connecteur est monté sur ledit adaptateur de couvercle (79) et un moyen (88) monté sur ledit adaptateur de couvercle (79) pour un mouvement entre une première position faisant communiquer ouvertement ledit passage (93) avec ledit conteneur (78), une seconde position pour former un troisième moyen de scellement fermant ledit passage (93) pour sceller ledit conteneur (78) et une troisième position pour ouvrir ledit passage (93), pour faire communiquer ledit conteneur (78) avec l'air ambiant pour libérer le vide à l'intérieur de ce dernier. 30 35 40 45 50
21. L'appareil de la revendication 1, caractérisé en ce que ledit élément chauffant (50a) est monté vers l'avant sur et sous ledit capot (33a). 55
22. L'appareil de la revendication 1, caractérisé en ce que ledit moyen d'évacuation (53a,54a) comprend un tube (54a) ayant son extrémité distale montée dans ledit capot (33a) en communication avec ledit moyen de chambre à vide (44a). 55
23. L'appareil de la revendication 1, caractérisé en ce que ledit moyen de scellement statique (39a) comprend un joint élastomère continu (39a) fixé sur un côté inférieur dudit capot (33a) pour s'étendre autour de la périphérie dudit moyen de chambre à vide (40a) et pour engager ladite surface de support pour former un joint statique à ce niveau quand ledit capot



(33a) est déplacé jusqu'à sa position fermée sur ladite surface de support.

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