REMOVABLE DRIP TRAYS AND BAG CLAMPS FOR VACUUM PACKAGING APPLIANCES

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Filed: Oct. 12, 2006

Related U.S. Application Data

Division of application No. 10/888,529, filed on Jul. 8, 2004.

Publication Classification

Int. Cl. B65B 31/00 (2006.01)

U.S. Cl. ..................................................... 53/512

ABSTRACT

The present invention teaches a bag clamp for use with a vacuum packaging appliance. The bag clamp has an open and a closed position. The open position is suitable for receiving an open end of a vacuum bag. The closed position is suitable for capturing and holding the open end of the vacuum bag during operation of the vacuum packaging appliance. A vacuum packaging appliance according to the present invention has at least one bag clamp, typically disposed within and fixedly attached to a drip tray. The present invention further teaches removable drip trays and vacuum packaging appliances with removable drip trays holding one or more bag clamps.
Start

52
Prepare Bag For Use

54
Place Product Inside Bag

56
Couple Bag To Vacuum Cuvdite

58
Evacuate Bag

60
Removably Seal Open End of Bag

62
Store Product In Removably Sealed Bag

64
Open Removably Sealed Bag With Tool

66
Remove Removable Portion of Bag (if any)

End

FIG. 6
(Prior Art)
REMOVABLE DRIP TRAYS AND BAG CLAMPS FOR VACUUM PACKAGING APPLIANCES

PRIORITY CLAIM

This application is a divisional of U.S. patent application Ser. No. 10/888,529 filed on Jul. 8, 2004 which claims benefit of Higer's provisional application No. 60/492,048, filed Jul. 31, 2003, and Small's provisional application No. 60/556,196, filed Mar. 24, 2004, the entire contents of each of the aforementioned applications are hereby incorporated by reference.

TECHNICAL FIELD

The invention relates to vacuum packaging appliances. In particular, the present invention teaches a bag clamp suitable for clamping an open end of a vacuum packaging bag and holding the bag in place within a vacuum chamber, as well as a removable drip tray for a vacuum packaging appliance.

BACKGROUND OF THE INVENTION

Vacuum packaging appliances, vacuum packaging bags, and methods for vacuum packaging product are well known in the art. Prior Art FIGS. 1-7 will be used to describe the vacuum packaging operation in general, with an emphasis setting the stage for the teaching of the present invention.

Prior Art FIG. 1 illustrates a multi-layer film 10 that is one common structural configuration for prior art vacuum packaging bag material. The film 10 includes a permanent sealing resin layer 12, a bond layer 14, a gas impermeable layer 16, a bond layer 18, and a structural layer 20. Bond layers 14 and 18 act to laminate opposing layers. The structural layer 20 provides strength so that the film 10 is useful as a vacuum packaging bag material. The gas impermeable layer 16 tends to inhibit gas flow across the film 10. The permanent sealing resin layer 12 is used to form permanent seals between two sheets of the film 10 as formed in a bag, pouch or storage receptacle. As will be appreciated, preformed vacuum packaging bags and bag roll material are the common commercial end products made from vacuum packaging films such as film 10.

Prior Art FIG. 2 illustrates a vacuum packaging bag 20 ready for use by a consumer. The vacuum packaging bag 20 is made of two sheets 22 and 24 made of vacuum packaging film such as film 10 of FIG. 1. The bag 20 has been heat-sealed on three sides forming permanent seals 26, 28 and 30. The bag 20 is formed with an opening 32 wherein the user can insert product. The opening 32 is later used to evacuate the bag 20.

Prior Art FIG. 3 illustrates the vacuum packaging bag 20 after a consumer has inserted a product 40 within the bag 20. As will be appreciated, bags such as bag 20 can be purchased by the consumer in preformed manufacture, or may be formed to a desired size by the consumer using the vacuum packaging appliance and a roll of bag material.

A prior art vacuum packaging appliance 100 is described now with reference to FIGS. 4-5. The vacuum packaging appliance 100 includes a heat seal mechanism 102, a drip tray 104 which is part of a vacuum circuit, a roll 106 of bag material, a control panel 110, and a cutting tool 112. The heat seal mechanism 102 is operable to heat-seal the bag 20.

With further reference to FIG. 4, the drip tray 104 serves to capture contaminants during evacuation of the bag 20. When the open end 32 of the bag 20 is coupled to the vacuum circuit and the lid of the appliance 100 closed as shown in FIG. 5, the vacuum circuit is closed and the bag 20 may be evacuated. Note that during operation the user must steady the bag 20 within the drip tray 104, being especially careful to ensure the open end 32 remains coupled with the vacuum circuit as the lid is closed. Once, but not until, the lid is closed, the bag 20 is held in place. As will be appreciated, over multiple cycles of use or in packaging products with substantial liquids and/or contaminants, the drip tray 104 can become unhygienically dirty, and the tray 104 itself may become full preventing effective evacuation and possibly damaging the vacuum system of the appliance 100.

The roll 106 has preformed heat seals 26 and 30 on opposing sides. The roll 106 may be unrolled by the consumer to form a bag of any desired size. The cutting tool 112 is operable to cut the unrolled bag material. When creating bags of desired size, the consumer typically adds a third seal before placing the product 40 in the bag 20.

Prior Art FIG. 6 is a flow chart illustrating a method 50 for vacuum sealing, storing and then accessing a product in a vacuum packaging bag. In an initial step 52, the consumer prepares a vacuum packaging bag 20 for use. This may involve the consumer using an appliance to form the bag 20 from bag roll material, i.e., cutting the desired amount of bag material and forming the third seal and leaving an open end. Alternatively, the consumer may utilize a preformed bag 20.

In a next step 54, a product 40 is placed within the bag 20, as illustrated in FIG. 4. The product 40 may be food, collectible items, or anything the consumer desires to store in an evacuated bag. In a step 56, the consumer couples the bag 20 holding product 40 to the vacuum circuit of the appliance 100. This is illustrated in FIGS. 4-5. In coupling the bag 20 to the vacuum circuit, the consumer must be careful so that no product spills or gets in the way of the coupling, while making sure the bag 20 stays in it proper place. In a step 58, the consumer shuts the lid so that the drip tray 104 captures the bag and then activates the appliance 100 to evacuate the bag 20. The vacuum level may be predefined and reached automatically, or may be controlled by the consumer. In any event, once the desired vacuum level is reached in the bag 20, the consumer activates the heat sealing mechanism 102 that then seals the bag 20. As shown in FIG. 7, the bag 20 now has a fourth seal 34.

In a step 62, the consumer stores the product 40 in the vacuum-sealed bag 20. For example, when the product is food, the consumer may store the bag 20 in a fridge or freezer. The user accesses product in the bag 20 by using a tool such as a scissors to cut through the bag 20. Accordingly, in a step 64, the consumer uses a scissors or other tool to open the bag to access the product 40. Then in a step 66, the consumer may reuse any remaining portion of the bag.

What is needed is a mechanism to assist the user in holding the bag in place during operation of the vacuum packaging appliance, particularly during the operation of inserting the bag and later closing the lid. This mechanism should be particularly suited for use in the evacuation process, but may also be helpful in forming seals on bag roll...
material when preparing bags for use. Further, a mechanism is needed to overcome problems arising when the drip tray becomes filled with contaminants.

SUMMARY OF THE INVENTION

[0014] The present invention teaches a variety of bag clamps, mechanisms and techniques for securing a bag within a vacuum packaging appliance during operation of the vacuum packaging appliance. The bag clamp has an open position and a closed position. The open position is suitable for receiving an open end of the vacuum bag. The closed position is suitable for capturing and holding the open end of the vacuum bag during operation of the vacuum packaging appliance. A vacuum packaging appliance according to the present invention has at least one bag clamp, typically disposed within and fixedly attached to a drip tray. The present invention further teaches a removable drip tray enabling a user to empty and clean the drip tray as desired.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] Prior Art FIG. 1 is a cross-sectional view of a plastic film used for forming vacuum packaging bags according to the prior art.

[0016] Prior Art FIG. 2 is an isometric view of a vacuum packaging bag of the prior art as ready for use.

[0017] Prior Art FIG. 3 is an isometric view of a vacuum packaging bag holding a product prior to evacuation and sealing according to the prior art.

[0018] Prior Art FIG. 4 is an isometric view of a vacuum packaging bag holding a product, the bag inserted into a vacuum packaging appliance and held in place by the user according to the prior art.

[0019] Prior Art FIG. 5 is an isometric view of a vacuum packaging appliance evacuating and sealing a vacuum packaging bag according to the prior art.

[0020] Prior Art FIG. 6 is a flow chart showing a method of vacuum packaging a product in a permanently sealed bag and then opening the permanently sealed bag with a tool, as required by the prior art.

[0021] Prior Art FIG. 7 is a top view of a permanently sealed vacuum packaging bag according to the prior art.

[0022] FIG. 8 is an isometric view of a vacuum packaging appliance in an open position in accordance with one embodiment of the present invention.

[0023] FIG. 9 is an isometric view of the vacuum packaging appliance of FIG. 8 in a closed position.

[0024] FIG. 10 is an exploded view of a portion of the vacuum packaging appliance of FIGS. 8-9, the view of FIG. 10 illustrating two clamps of the present invention in open positions arranged to receive an open end of a bag.

[0025] FIG. 11 is an exploded view of a portion of the vacuum packaging appliance of FIGS. 8-9, the view of FIG. 11 illustrating two clamps of the present invention in closed positions arranged to hold the bag in place within a drip tray.

[0026] FIG. 12 is an isometric view of a disassembled drip tray assembly according to another aspect of the present invention.

[0027] FIG. 13 is an isometric view of a clamp with a spring-loaded biasing mechanism in a closed position in accordance with one embodiment of the present invention.

[0028] FIG. 14 is an isometric view of the clamp of FIG. 13 in an open position in accordance with yet another embodiment of the present invention.

[0029] FIG. 15 is an isometric view of the clamp of FIGS. 13-14 in a disassembled state.

[0030] FIG. 16A is an isometric view that illustrates a vacuum packaging appliance having a removable drip tray.

[0031] FIG. 16B is an isometric view of the base of the vacuum packaging appliance of FIG. 16A illustrating arrows A-A associated with a transverse cross-sectional view referenced in FIGS. 17-18.

[0032] FIG. 17 illustrates a removable drip tray arrangement according to certain embodiments and is a transverse cross-sectional view through the base of the vacuum packaging appliance taken in the direction of arrows A-A shown in FIG. 16B.

[0033] FIG. 18 illustrates a transverse cross-sectional view of another embodiment of a removable drip tray arrangement.

DETAILED DESCRIPTION

[0034] FIGS. 1-7 show prior art. FIGS. 8 and 9 illustrate a vacuum packaging appliance 200 in accordance with one embodiment of the present invention. FIGS. 8 and 9 represent fully closed and fully opened positions, respectively, of the vacuum packaging appliance 200. The vacuum packaging appliance 200 includes a lid 202 pivotally mounted to a base 204, a control panel 206, a heat-sealing mechanism 208, a vacuum chamber 210 coupled to a vacuum circuit, a gasket 212 for sealing the vacuum chamber 210, a drip tray 214 being a removable component of the vacuum chamber 210, and two bag clamps 216. A bag roll 218 of vacuum packaging bag material is stored in the vacuum packaging appliance as shown.

[0035] The bag clamps 216 serve to clamp an open end 232 of a bag 230. The bag clamps 216 may grab one or two sheets of the bag 230. Once the bag clamps 216 are closed onto the bag 230, the user need not maintain the position of the bag for closure and evacuation. The open end 232 is held in place within the drip tray 214 such that when the lid 202 closes, the bag 230 is coupled to the vacuum circuit and held in place by the bag clamps 216. Thus the bag clamps 216 assist the user in coupling the bag 230 with the vacuum circuit of the appliance 200. While the embodiment of FIGS. 8 and 9 includes two bag clamps 216, the present invention contemplates any number (one, two or more) bag clamps for assisting the user.

[0036] The bag clamps 216 may freely rest in the drip tray 214, perhaps held in place by their mass, or may be attached to the drip tray or some other portion of the vacuum appliance 200. For example, the bag clamps 216 may be glued, spot welded, or riveted to the drip tray 214. Alternatively, the bag clamps 216 may be detachably mounted internal to the drip tray 214, via a mechanical or vacuum latching mechanism. The present invention also contemplates manufacturing the bag clamps 216 out of material suitable for washing, either by hand or within a typical dishwashing machine.
FIGS. 10-11 illustrate a blowup portion 250 of the vacuum packaging appliance 200 of FIGS. 8-9. There a bag clamp 216 includes a clamping mechanism 252 and a spring-loaded biasing mechanism 254.

The clamping mechanism 252 of FIG. 10 is manually pushed to an open position, which open position must be maintained by the user activating the spring-loaded biasing mechanism 254. In the open position, the clamping mechanism 252 is operable to receive at least one sheet of the open end 232 of the bag 230. When the user releases, the clamping mechanism 252 of FIG. 11 is pulled into a closed position by the spring-loaded biasing mechanism 254. In the closed position, the clamping mechanism 252 is clamps onto the open end 232 and holds the bag 230 in place within the drip tray 214.

The embodiment of FIGS. 10-11 is a clamping mechanism having a normally closed state due to the spring-loaded biasing mechanism 254. However, the present invention contemplates a variety of clamping mechanisms such as toggle mechanisms which lock into either of the open and closed states based upon user operation. Additionally, the clamp need not be spring controlled, but could have another clamping or biasing mechanism such as a kinematic or vacuum latching system.

FIG. 12 illustrates a disassembled drip tray assembly 260 in accordance with yet another embodiment of the present invention. The drip tray assembly 260 includes a sealing gasket 212, a drip tray 214, and two bag clamps 216. In the embodiment of FIG. 12, the bag clamps 216 can be fixedly or detachably mounted within the drip tray 214. However, the bag clamps 216 may simply slide into the drip tray 214 and be held in place via the closing mechanisms of the lid 202 and the base 204, or perhaps through a vacuum latching device. The drip tray assembly 260 may be removable from the vacuum packaging appliance 200 for ease of emptying and/or cleaning.

FIG. 13 and FIG. 14 illustrate exploded versions of the clamp 252 in closed and open positions, respectively. FIG. 15 illustrates an exploded view of a disassembled clamp 216 in accordance with yet another embodiment of the present invention. The clamp 216 is seen to have an outer mechanism 300, an inner mechanism 302, and a spring 304.

The spring 304 fits into a divot 306 located on a base 308 of the outer mechanism 300. The inner mechanism 302 has pins 310 that mate into cavities 312 formed in the outer mechanism. The action of the spring 304 then forces the inner mechanism 302 into the closed position in a manner that enables a user to push the clamp into an open position. In the closed position, a lower lip 314 is in spring pressured contact with an upper lip 316, thereby holding in place the bag.

FIG. 16A is an isometric view that illustrates a vacuum packaging appliance having a removable drip tray. In FIG. 16A, a vacuum packaging appliance 400 includes a base 402 and a lid 450. Base 402 includes a vacuum channel 404 in which a removable drip tray may be inserted. The removable drip tray catches over-spills from storage bags that are being sealed using vacuum packaging appliance 400. The removable drip tray may be conveniently removed from the vacuum packaging appliance for cleaning or for sterilization. It is to be noted that the storage bags are suitable for storing items other than food.

According to certain embodiments, a base 402 houses a vacuum pump (not shown), and includes a control panel (not shown) at the top frontal portion of the base. The control panel includes an accessory port for use in removing gases from storage canisters, an instant seal button to manually start sealing a storage bag, and a vacuum button to start removing gases from storage bags or canisters.

In addition, the control panel may include indicator lights to signal the start or completion of various processes such as the sealing process, vacuum process and/or machine re-programming when transitioning from one process to the next.

In certain embodiments, the vacuum packaging appliance includes a sensing mechanism for sensing the presence or absence of a drip tray. The sensing mechanism may be such that the vacuum appliance is temporarily disabled if the sensing mechanism senses the absence of the drip tray. The sensing mechanism may be any suitable electrical or electromechanical mechanism. For example, the sensing mechanism may be a switch that disables the vacuum appliance as long as the switch remains open. The switch closes only when the drip tray is present.

Some examples of vacuum packaging appliances are the Tilia® FoodSaver® vacuum packaging system series. Some examples of storage bags and storage canisters used in conjunction with vacuum packaging appliances are the Tilia® FoodSaver® bags and FoodSaver® canisters. The Tilia® FoodSaver® bags and FoodSaver® canisters are suitable for storing items other than food.

FIG. 16B is an isometric view of the base of the vacuum packaging appliance 400 illustrating arrows A-A associated with a transverse cross-sectional view referenced in FIG. 17 and FIG. 18. FIG. 17 illustrates a drip tray arrangement 500 according to certain embodiments and is a transverse cross-sectional view through the base of the vacuum packaging appliance 400 taken in the direction of arrows A-A shown in FIG. 16B.

In the removable drip tray arrangement 500 in FIG. 17, a removable drip tray 506 can be inserted in vacuum channel 504. Gasket 512 is mounted on the top frontal surface 520 of base 502 of the vacuum packaging appliance. A storage bag 510 has its open end 510a within the channel of removable drip tray 506.

Removable drip tray 506 catches the over-flowing liquids and/or particulate 508 during the vacuum packaging process. Removable drip tray 506 may be lifted out of vacuum channel 504 for purposes of cleaning or to discard the liquids and/or particulate 508. Removable drip tray 506 may be made of a durable dishwasher-safe material. Gasket 512 is operably mounted on the top frontal surface 520 in a manner for effectively creating a static seal around the vacuum channel when the lid of the vacuum packaging appliance is in the closed position. Gasket 512 is a continuous gasket that extends around the perimeter of vacuum channel 504. The lid (not shown in FIG. 17) of the vacuum packaging appliance is said to be in the closed position when...
the lid of the vacuum packaging appliance overlies and is pressed against top frontal surface 520. As an option, the inner surface of the lid may include a gasket that corresponds to the gasket on top frontal surface 520. In such a case, when the lid is in the closed position, the gasket on the inner surface of the lid makes contact with the gasket 512 to form a static seal around the vacuum channel. The gaskets may be made of an elastomeric or other suitable material for creating a static seal when the lid of the vacuum packaging appliance is in the closed position.

A vacuum packaging appliance for vacuum packaging a bag comprising:
- a base having a drip tray;
- a lid coupled to the base and moveable between an open position and a closed position;
- an evacuation chamber positioned in the lid and configured to form a vacuum chamber with said drip tray in said closed position, wherein said vacuum chamber is adapted to receive an open end of said bag therein;
- a vacuum source coupled to said evacuation chamber and configured to remove air from said bag; and
- a bag clamp arranged to clamp said open end of said bag and hold said bag in place during operation of said vacuum packaging appliance.

46. A vacuum packaging appliance as recited in claim 45, wherein said bag clamp is disposed within said drip tray.

47. A vacuum packaging appliance as recited in claim 46, wherein said bag clamp is glued to said drip tray.

48. A vacuum packaging appliance as recited in claim 46, wherein said bag clamp is spot-welded to said drip tray.

49. A vacuum packaging appliance as recited in claim 46, wherein said bag clamp is riveted to said drip tray.

50. A vacuum packaging appliance as recited in claim 46, wherein said bag clamp is detachably coupled to said drip tray.

51. A vacuum packaging appliance as recited in claim 45, wherein said bag clamp is made of washable material.

52. A vacuum packaging appliance as recited in claim 45, wherein said bag clamp is one of a plurality of bag clamps.

53. A vacuum packaging appliance for vacuum packaging a bag comprising:
- a base having a removable drip tray;
- a lid coupled to the base and moveable between an open position and a closed position;
- an evacuation chamber positioned in said lid and configured to form a vacuum chamber with said drip tray in said closed position, wherein said vacuum chamber is adapted to receive an open end of said bag therein;
- a vacuum source coupled to said evacuation chamber and configured to remove air from said bag; and
- a heat sealing mechanism suitable for sealing said open end of said bag.
54. A vacuum packaging appliance as recited in claim 44, wherein said bag retainer includes an engaging surface for engaging the bag.  
55. A vacuum packaging appliance as recited in claim 44, wherein said bag retainer is biased in said closed position.  
56. A vacuum packaging appliance as recited in claim 55, wherein said bag retainer includes an outer mechanism and an inner mechanism movable relative to said outer mechanism.  
57. A vacuum packaging appliance as recited in claim 56, wherein said inner mechanism includes a first surface and said outer mechanism includes a second surface, and said first surface being in biased contact with said second surface for holding the vacuum bag between said first and said second surfaces.  
58. A vacuum packaging appliance as recited in claim 44, wherein said bag retainer includes a clamping mechanism.  
59. A vacuum packaging appliance as recited in claim 44, wherein said bag retainer is one of a plurality of bag retainers.  
60. A vacuum packaging appliance as recited in claim 44, wherein said base includes a vacuum chamber for receiving the open end of the bag and said bag retainer is disposed in said vacuum chamber.  
61. A vacuum packaging appliance as recited in claim 44, wherein said base includes a vacuum channel and a drip tray is removably disposed in said vacuum channel, and said bag retainer is disposed on said drip tray.  
62. A vacuum packaging appliance as recited in claim 61, wherein said bag retainer is one of a plurality of bag retainers, and said plurality of bag retainers are spaced along a length of said drip tray.  
63. A vacuum packaging appliance as recited in claim 60, wherein said vacuum chamber is configured such that when the open end of the vacuum bag is secured to said bag retainer a portion of the bag extends outside of said vacuum chamber.  

64. A vacuum packaging appliance comprising:  
a base for receiving an open end of a vacuum bag, said base including a vacuum chamber;  
a vacuum source in communication with said vacuum chamber; and  
a bag retainer disposed within said vacuum chamber, said bag retainer having an opening for receiving the open end of the vacuum bag, said bag retainer having opposed surfaces for capturing and holding the open end of the vacuum bag there between during operation of the vacuum packaging appliance.  
65. A vacuum packaging appliance as recited in claim 64, wherein a drip tray is disposed in said vacuum chamber and said bag retainer is disposed on said drip tray.  
66. A vacuum packaging appliance as recited in claim 65, wherein said bag retainer is one of a plurality of bag retainers, and said plurality of bag retainers are spaced along a length of said drip tray.  
67. A vacuum packaging appliance as recited in claim 65, wherein said bag retainer is fixedly secured to said drip tray.  
68. A vacuum packaging appliance as recited in claim 65, wherein said drip tray is removable from said base.  
69. A vacuum packaging appliance as recited in claim 64, wherein said bag retainer includes a clamping mechanism having an open and closed position.  
70. A vacuum packaging appliance as recited in claim 69, wherein said bag retainer is biased in said closed position.  
71. A vacuum packaging appliance as recited in claim 64, wherein said vacuum chamber is configured such that when the open end of the bag is secured to said bag retainer a portion of the bag extends outside of said vacuum chamber.

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