A direct insert vacuum packaging appliance is disclosed. The direct insert aspect of such a vacuum packaging appliance allows a vacuum packaging bag to be inserted into the vacuum packaging appliance directly and with ease. According to certain embodiments, the direct insert vacuum packaging appliance includes a vacuum chamber with drip tray and a clamping mechanism adapted for receiving an open end of a vacuum packaging bag for evacuation of gases from the vacuum packaging bag. Such a direct insert vacuum packaging appliance may be lidded or lidless and may vary from implementation to implementation.
DIRECT BAG INSERT VACUUM PACKAGING APPLIANCE

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Application No. 60/624,799, filed on Nov. 2, 2004.

TECHNICAL FIELD

[0002] The present invention is directed to packaging techniques, and more specifically to bag insertion aspects of vacuum packaging appliances.

BACKGROUND

[0003] Vacuum packaging is a process for removing oxygen and other gases from containers holding food and other products that deteriorate in the presence of gases. For example, food spoilage can occur due to oxidation. Thus, vacuum packaging can extend the life of products that deteriorate in the presence of gases by removing nearly all of the gases in a sealed container in which such products are stored.

[0004] While vacuum packaging appliances are very useful, they can be awkward to use. To explain, products that are to be vacuum packaged can be stored using vacuum packaging bags. The open end of the vacuum packaging bag needs to be carefully positioned in a vacuum sealing chamber of the vacuum packaging appliance in order to evacuate gasses from the interior of the packaging bag. The design of the vacuum packaging appliance may be such that the placement of the packaging bag in the vacuum sealing chamber may involve considerable dexterity and manual adjustment on the part of the user. For example, the user is often required to hold the open end of the packaging bag in place over the vacuum chamber while simultaneously attempting to position the lid of the vacuum packaging appliance in the closed position without jamming the user’s fingers.

[0005] In view of the foregoing, a more convenient method is needed for inserting vacuum sealing packaging bags into vacuum packaging appliances.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] FIG. 1 is a perspective view of a bag-insert that can be adapted for use in a vacuum packaging device, according to certain embodiments.

[0007] FIG. 2 is a perspective view of a bag-insert that is juxtaposed with a sample packaging bag, according to certain embodiments.

[0008] FIG. 3 is a perspective view of a bag insert in a closed position with upper flap disposed atop lower flap for gripping a packaging bag.

[0009] FIG. 4 is a perspective view of a bag-insert is oriented in an operable relationship with an evacuation chamber.

[0010] FIG. 5 illustrates the placement and removability of the bag-insert from evacuation chamber, according to certain embodiments.

[0011] FIG. 6 illustrates a vacuum packaging appliance that includes a direct bag-insert feature and configured for under-cabinet or under-counter use, according to certain embodiments.

[0012] FIG. 7 is a side cross sectional schematic illustrating some of the features of a vacuum packaging appliance that includes a bag-insert mechanism, according to certain embodiments.

[0013] FIG. 8 shows a side cross-sectional view of some features of a lidless vacuum packaging appliance with a bag-insert, according to certain other embodiments.

[0014] FIG. 9 shows a side cross-sectional view of some features of a vacuum packaging appliance with a bag-insert in a lidded configuration, according to certain embodiments.

[0015] FIG. 10 is a perspective view of a lidded vacuum packaging appliance with a bag-insert feature.

[0016] FIG. 11 is a perspective view of a lidded vacuum packaging appliance with a bag-insert feature, according to certain embodiments.

DETAILED DESCRIPTION

[0017] According to one aspect of certain embodiments, the vacuum packaging appliance is equipped with a bag-insert mechanism such that an open end of a packaging bag can be directly inserted either for evacuation and/or sealing the bag. According to one aspect, the bag-insert is disposed in the evacuation chamber (also referred to herein as a vacuum chamber) of the packaging appliance. According to some embodiments, the bag-insert mechanism is removable from the evacuation chamber for ease in cleaning, repair and/or replacement. In other embodiments, the bag-insert is an integral component of the evacuation chamber.

[0018] According to another aspect of some embodiments, the bag-insert mechanism includes two flap portions that are connected by a hinge mechanism such that the flap portions can be rotatably disposed in an open position to receive an open end of the packaging bag. Further, such flap portions can be rotatably disposed in a closed position to hold the open end of the bag in position during an evacuation procedure for evacuation of gases and/or for sealing.

[0019] Further, according to another aspect of certain embodiments, the bag-insert mechanism includes a gripping mechanism such as gripping posts for maintaining the open end of the packaging bag in position within the evacuation chamber. The embodiments are not limited to any particular type of gripping mechanism and thus the type of gripping mechanisms may vary from implementation to implementation.

[0020] According to yet another aspect of certain embodiments, a receiving portion of the bag-insert mechanism is operably oriented in a substantially vertical plane relative to the horizontal base of the vacuum packaging appliance. In certain other embodiments, the receiving portion of the bag-insert mechanism is operably oriented in a substantially horizontal plane that is parallel to the horizontal base of the vacuum packaging appliance.

[0021] According to another aspect of certain embodiments, the packaging appliance having a bag-insert may be in a lidless configuration. According to one aspect of a lidless configuration, inflatable bladders in the packaging appliance are inflated to form a static seal for hermetically sealing the evacuation chamber during evacuation of gasses from the packaging bag. In other lidless configurations, inflatable bladders may be used as actuators to move
mechanical sealing elements to hermetically seal the evacuation chamber. The embodiments are not limited to any particular type of actuators, and thus the type of actuators may vary from implementation to implementation.

[0022] In certain other embodiments, the packaging appliance with bag-insert may be in a lidded configuration. According to yet another aspect of certain embodiments, the packaging appliance is configured as a counter-top appliance. However, in other embodiments, the packaging appliance may be configured as an under-the-counter (or under-cabinet) appliance.

[0023] FIG. 1 is a perspective view of a bag-insert that can be adopted for use in a vacuum packaging device, according to certain embodiments. Bag-insert 100 includes an upper flap 102a that is operably hinged to a lower flap 102b by a hinge mechanism 104. Upper flap 102a includes gripping posts 106. Lower flap 102b includes indentations 110 that operate with corresponding gripping posts 106 to maintain a grip on an open end of a packaging bag when upper flap 102a is disposed atop lower flap 102b as depicted in FIG. 3 herein. Further, bag-insert 100 includes curved edges 108 such that bag-insert 100 may be easily removed from an evacuation chamber as described in greater detail with reference to FIG. 5 herein.

[0024] FIG. 2 is a perspective view of a bag-insert 200 that is juxtaposed with a simple packaging bag 212, according to certain embodiments. FIG. 2 shows an upper flap 202a that is operably hinged to a lower flap 202b by a hinge mechanism 204. FIG. 2 also demonstrates that when packaging bag 212 is inserted directly into the evacuation chamber, an open end 214 of packaging bag 212 is automatically positioned in bag-insert 200 such that open end 214 can be securely gripped between gripping post 206 and corresponding indentations 210.

[0025] FIG. 3 is a perspective view of a bag insert 300 in a closed position with upper flap 302a disposed atop lower flap 302b for gripping a packaging bag 312. Hinge mechanism 304 makes it possible for upper flap 302a to be disposed atop lower flap 302b easily.

[0026] FIG. 4 is a perspective view 400 of a bag-insert 401 that is oriented in an operable relationship with an evacuation chamber 420. Evacuation chamber 420 includes an orifice 425 defined by a perimeter 425a. To explain the orientation of bag-insert 401, bag-insert 401 is oriented such that the receiving opening 403 formed by upper flap 402b and lower flap 402b is outwardly facing through orifice 425 of evacuation chamber 420. Evacuation chamber further includes an optional gasket 422.

[0027] FIG. 4 also demonstrates that packaging 412 can be securely held in position, suitable for an evacuation procedure, using a gripping mechanism. In certain embodiments, the gripping mechanism includes gripping posts 406 and corresponding indentations 410. However, the embodiments are not limited to any particular type of gripping mechanisms. Thus, the type of gripping mechanism varies from implementation to implementation. For example, the indentations 410 may be optional. Another non-limiting example of a suitable gripping mechanism are roughened edges along the length of either or both flaps of the bag-insert so that friction provided by the roughened edges would hold a packaging bag in position. Further, the bag-insert may be equipped with a magnet such that the upper flap is attracted into a closed position atop the lower flap when the upper flap is in relative close proximity to the lower flap. The magnetic strength of such a magnet may be selected such that the bag-insert can maintain a suitable grip on a packaging bag even when the packaging bag is loaded with content. The magnetic strength can vary from implementation to implementation.

[0028] FIG. 5 illustrates the placement and removability of the bag-insert 501 from evacuation chamber 520, according to certain embodiments. In order to remove bag-insert 501 from evacuation chamber, one need only push on one edge of the bag-insert 501. FIG. 5 shows a user’s thumb pushing on one end 505a of the bag-insert 501. The user can push on either end (505a or 505b) of bag-insert 501 to achieve the same result of extricating bag-insert 501 from evacuation chamber 520. Each end (505a and 505b) of bag-insert 501 is characterized by curved edges such as curved edge 506. To explain, the edge of the upper flap 502a and the lower flap 502b are curved on either end. When a user pushes on a curved end such as end 505a of bag-insert 501, the force that is exerted on the curved end 505a causes a rotation of bag-insert 501 about curved end 505a against a back wall of evacuation chamber 520. Such a rotation causes the bag-insert to rotate out of the evacuation chamber.

[0029] FIG. 6 illustrates a vacuum packaging appliance 600 that includes a direct bag-insert feature and is configured for under-cabinet or under-counter use, according to certain embodiments. Vacuum packaging appliance 600 may be configured either as a lidded appliance or a lidless appliance. Lidless configurations are described in greater detail herein with reference to FIG. 7 and FIG. 8. Lidless configurations are described in greater detail herein with reference to FIG. 9 and FIG. 10.

[0030] FIG. 6 shows that the vacuum packaging appliance 600 is configured for mounting under a cabinet 650 using a mounting mechanism such as mounting bracket 655. Vacuum packaging appliance 600 includes a bag-insert 620, shown at an orifice or receiving slot 622 of an evacuation chamber for vacuum packaging appliance 600. The evacuation chamber orifice 622 is disposed on the frontal side 632 of vacuum packaging appliance 600 for easy access. In operation, an open end of a packaging bag may be conveniently inserted in bag-insert mount 624 formed by upper flap 626a and lower flap 626b, and disposed therebetween. Bag-insert 620 further includes a gripping mechanism 628 for maintaining an open end of a packaging bag in position for evacuation and or sealing. One non-limiting example of a gripping mechanism are gripping posts on one flap with or without corresponding indentation on the opposite flap and sized for suitable mating with the gripping posts. Another non-limiting example of a gripping mechanism for positioning a packaging bag in the bag-insert is a rounded outer edge along the length of the one or both flaps of the bag-insert. FIG. 6 also shows an access door 630 through which a drip tray (not shown) can be removed for cleaning, according to certain embodiments. The drip tray feature is optional. In some embodiments where the evacuation chamber is integrated with a drip tray, the integrated evacuation chamber/drip tray may be removed for cleaning via access door 630.

[0031] FIG. 7 is a side cross sectional schematic illustrating some of the features of a vacuum packaging appliance
that includes a bag-insert mechanism, according to certain embodiments. In FIG. 7, vacuum packaging appliance 700 is configured as a lidless under-cabinet appliance. Lidless packaging appliance 700 is conveniently stationed under cabinet 750 using support braces 755. Lidless packaging appliance 700 includes a bag-insert 706 in an evacuation chamber 702, at a slot 704 for accessing the bag-insert, and optionally, a drip tray 718. FIG. 7 shows that evacuation chamber 702, bag-insert 706 are disposed in a manner to allow access via the frontal side 701 of the vacuum packaging appliance. FIG. 7 also shows a sealing mechanism for hermetically sealing evacuation chamber 702 when a vacuum is to be created in evacuation chamber 702. Such a sealing mechanism includes actuator bladders 708a and 708b connected to a vacuum motor 710, and shutter mechanisms 712a and 712b. Shutter mechanisms 712a and 712b are spring loaded by springs 714a and 714b. Springs 714a and 714b keep the shutter mechanisms in a retracted position such that slot 704 remains unobstructed and unsealed to allow access to bag-insert 706 and evacuation chamber 702. In order to hermetically seal evacuation chamber 702, the actuator bladders 708a, 708b are inflated with the aid of vacuum motor 710. Vacuum motor 710 intakes air from the evacuation chamber and exhausts the air into actuator bladders 708a, 708b. As actuator bladders 708a, 708b inflate, they push against springs 714a, 714b and cause shutter mechanisms 712a and 712b into an extended position. The shutter mechanisms 712a and 712b are extended until slot 704 is completely sealed from the exterior of the appliance. Vacuum motor 710 continues to operate in order to completely evacuate the evacuation chamber. Appropriate bleeder mechanisms can be employed to exhaust excess air to the exterior once the actuator bladders are full. Shutter mechanisms 712a and 712b may optionally include gaskets and a heat sealing profile such as a heat sealing element 716.

[0032] FIG. 8 shows a side cross-sectional view of some features of a lidless vacuum packaging appliance with a bag-insert, according to certain other embodiments. In FIG. 8, lidless packaging appliance 800 is mounted under cabinet 850 using support mounts 855. Lidless packaging appliance 800 includes a bag-insert 806 in an evacuation chamber 802 and optionally, a drip tray 818. The receiving portion of bag-insert 806 is disposed for access on the frontal side 801 of vacuum packaging appliance 800. Slot 804 is hermetically sealed from the exterior of the appliance by balloons 808 and 809. Balloons can be inflated using vacuum pump 801 into an inflated position as shown by ghost lines 808a and 809a. One of the balloons may include a heat sealing profile such as heat sealing element 816.

[0033] FIG. 9 shows a side cross-sectional view of some features of a vacuum packaging appliance with a bag-insert in a lidded configuration, according to certain embodiments. To save counter-space, lidded packaging appliance 900 can be mounted under cabinet 950 using support braces 955. Lidded packaging appliance 900 includes a lid 920, a bag-insert 906 in an evacuation chamber 902, a vacuum motor 910, and optionally, a drip tray 918. Evacuation chamber 902 can be hermetically sealed from the exterior by moving lid 920 into a closed position as shown by ghost outline 924. Optionally, lid 920 can slid into a convenient position atop the appliance as shown by ghost outline 922. By sliding lid 920 to rest on the top surface of the appliance, a user of the appliance is offered an unobstructed view of the frontal portion of bag-insert 906 so as to allow the user to maneuver a packaging bag into bag-insert 906.

[0034] FIG. 10 is a perspective view of a lidded vacuum packaging appliance with a bag-insert feature. Lidded appliance 1000 shows a lid 1020, a bag-insert 1006 in an evacuation chamber 1006. Slot 1004 of evacuation chamber may optionally include gasket 1008 for effecting a better static seal. Lid 1020 may optionally include a suitable gasket (not shown) to effect a better hermetic seal when lid 920 is in the closed position. Further, lid 1020 may optionally include a latching mechanism (not shown) to secure the lid in a closed position.

[0035] FIG. 11 is a perspective view of a lidded vacuum packaging appliance with a bag-insert feature, according to certain embodiments. In FIG. 11, evacuation chamber 1102 and bag-insert 1106 are disposed for access above the top horizontal surface 1116 of vacuum packaging appliance 1100. The receiving slot 1104 of evacuation chamber 1102 is in a plane that is parallel to a frontal side 1115 of vacuum packaging appliance 1100, according to certain embodiments. According to certain other embodiments, the receiving slot of the evacuation chamber is in a plane that is parallel to top horizontal surface 1116 of vacuum packaging appliance 1100. Evacuation chamber 1102 can be hermetically sealed from the exterior by lid 1120. Lid 1120 can include a suitable gasket and latch.

[0036] In the foregoing specification, embodiments of the invention have been described with reference to numerous specific details that may vary from implementation to implementation. It will be evident that various modifications and changes may be made thereto without departing from the broader spirit and scope of the invention. The specification and drawings are, accordingly, to be regarded in an illustrative rather than a restrictive sense.

We claim:

1. A vacuum packaging appliance, the vacuum packaging appliance comprising:

   a bag-insert mechanism disposed in an evacuation chamber in an operable relationship to receiving slot of said evacuation chamber; and

   wherein said bag-insert mechanism is operably oriented for receiving and engaging an open end of a packaging bag.

2. The vacuum packaging appliance of claim 1, wherein said receiving slot of said evacuation chamber is oriented such that a plane formed by a perimeter of said receiving slot is substantially vertical relative to a substantially horizontal base of said vacuum packaging appliance.

3. The vacuum packaging appliance of claim 2, wherein said receiving slot is located on a frontal face of said vacuum packaging appliance.

4. The vacuum packaging appliance of claim 1, wherein said receiving slot of said evacuation chamber is oriented such that a plane formed by a perimeter of said receiving slot is substantially parallel to a substantially horizontal base of a substantially horizontal base of said vacuum packaging appliance.

5. The vacuum packaging appliance of claim 1, further comprises a lid when said vacuum packaging appliance is used in a lidded configuration, wherein said lid is adapted to statically seal said evacuation chamber when said lid is moved to a closed position.
6. The vacuum packaging appliance of claim 1, further comprises inflatable bladders for vacuum sealing said evacuation chamber when said vacuum packaging appliance is used in a lidless configuration.

7. The vacuum packaging appliance of claim 6, wherein said inflatable bladders form an air-tight static seal of said evacuation chamber when said inflatable bladders are sufficiently inflated before evacuation of said packaging bag.

8. The vacuum packaging appliance of claim 6, wherein said inflatable bladders are inflated for moving mechanical static seal components into a sealed position for forming an air-tight static seal of said evacuation chamber.

10. The vacuum packaging appliance of claim 1, further comprises a heat sealing element for heat sealing said packaging bag.

11. The vacuum packaging appliance of claim 1, wherein said bag-insert mechanism includes a plurality of gripping posts for releasably engaging said packaging bag to maintain said open end of said packaging bag in communication with a drip tray in said evacuation chamber.

12. The vacuum packaging appliance of claim 11, wherein said bag-insert mechanism includes receiving indentations corresponding to said plurality of gripping posts for releasably engaging said packaging bag to maintain said open end of said packaging bag in communication with said drip tray in said evacuation chamber.

13. The vacuum packaging appliance of claim 1, wherein said bag-insert mechanism includes two flap portions connected by a hinge mechanism, wherein said flap portions are rotatably movable about said hinge mechanism between an open and a closed position.

14. The vacuum packaging appliance of claim 1, wherein said bag-insert mechanism is removable from said evacuation chamber.

15. The vacuum packaging appliance of claim 1, wherein said bag-insert mechanism includes curved edges for easy removal from said evacuation chamber.

16. The vacuum packaging appliance of claim 1, wherein said bag-insert mechanism is integrated with said evacuation chamber.

17. The vacuum packaging appliance of claim 1, wherein said bag-insert mechanism is integrated with a removable drip tray associated with said evacuation chamber.

18. A vacuum packaging appliance, the vacuum packaging appliance comprising:

   a means for forming an evacuation chamber with an opening oriented in a substantially vertical plane relative to a substantially horizontal base of said vacuum packaging appliance; and

   a means for receiving and engaging an open end of a packaging bag wherein said means for receiving and engaging being disposed in said evacuation chamber and being operably oriented in said opening.

19. The vacuum packaging appliance of claim 18, further comprising a means for hermetically sealing said evacuation chamber.

20. The vacuum packaging appliance of claim 18, wherein said means for receiving and engaging is removable from said evacuation chamber.

21. The vacuum packaging appliance of claim 18, wherein said means for receiving and engaging is integrated with said evacuation chamber.

22. The vacuum packaging appliance of claim 18, wherein said means for receiving and engaging is integrated with a removable drip tray.

23. An apparatus for vacuum sealing a packaging bag, said apparatus comprising a vacuum chamber for evacuating gases from said packaging bag and said vacuum chamber having an orifice suitably oriented for allowing one end of said packaging bag to be inserted directly into said orifice when said packaging bag is oriented in a substantially horizontal position relative to said apparatus and wherein said orifice includes a holding mechanism that is adjustable for alternately securing and releasing said one end of said packaging bag.

24. The apparatus of claim 23, wherein said holding mechanism includes gripping posts for said alternately securing and releasing said one end of said packaging bag.

25. The apparatus of claim 23, wherein said holding mechanism includes two flap portions that are flexibly connected to allow said flap portions to rotatably move between an open and a closed position.

26. A method of packaging using a vacuum packaging appliance, the method comprising:

   using a bag-insert mechanism into which an open end of a packaging bag is directly inserted when sealing said packaging bag is desired, wherein said bag-insert mechanism is in operable relationship to an opening of an evacuation chamber of said vacuum packaging appliance.

27. The method of claim 26, further comprises using said vacuum packaging appliance in a lidded configuration by including a lid in said vacuum packaging appliance and wherein said lid is adapted to statically seal said evacuation chamber when said lid is moved to a closed position.

28. The method of claim 26, further comprises using inflatable bladders for vacuum sealing said evacuation chamber when said vacuum packaging appliance is used in a lidless configuration.

29. The method of claim 28, wherein said inflatable bladders form an air-tight static seal of said evacuation chamber when said inflatable bladders are sufficiently inflated before evacuation of said packaging bag.

30. The method of claim 28, wherein said inflatable bladders are inflated for moving mechanical static seal components into a sealed position for forming an air-tight static seal of said evacuation chamber.

31. The method of claim 26, further comprises using a heat sealing element for heat sealing said packaging bag.

32. The method of claim 26, wherein said bag-insert mechanism includes gripping posts for releasably engaging said packaging bag to maintain said open end of said packaging bag in communication with a drip tray in said evacuation chamber.

33. The method of claim 26, wherein said bag-insert mechanism includes two flap portions connected by a hinge mechanism, wherein said flap portions are rotatably movable between an open and a closed position about said hinge mechanism.

34. The method of claim 26, wherein said bag-insert mechanism is removable from said evacuation chamber.

35. The method of claim 26, wherein said bag-insert mechanism is integrated with said evacuation chamber.

36. The method of claim 26, wherein said bag-insert mechanism is integrated with a removable drip tray associated with said evacuation chamber.
37. The method of claim 26, wherein a receiving portion of said bag-insert mechanism is oriented such that a plane that is substantially parallel to said receiving portion is substantially vertical relative to a substantially horizontal base of said vacuum packaging appliance.

38. The method of claim 26, wherein a receiving portion of said bag-insert mechanism is oriented such that a plane that is substantially parallel to said receiving portion is substantially parallel to a substantially horizontal base of said vacuum packaging appliance.

39. A vacuum packaging appliance, the vacuum packaging appliance comprising:

a bag-insert mechanism disposed in an evacuation chamber in an operable relationship to a receiving slot of said evacuation chamber;

inflatable bladders for sealing said evacuation chamber; and

wherein said bag-insert mechanism is operably oriented for receiving and engaging an open end of a packaging bag.

40. The vacuum packaging appliance of claim 39, wherein said inflatable bladders form an air-tight static seal of said evacuation chamber when said inflatable bladders are sufficiently inflated before evacuation of said packaging bag.

41. The vacuum packaging appliance of claim 39, wherein said inflatable bladders are inflated for moving mechanical static seal components into a sealed position for forming an air-tight static seal of said evacuation chamber.

42. The vacuum packaging appliance of claim 39, further comprises a heat sealing element for heat sealing said packaging bag.

43. The vacuum packaging appliance of claim 39, wherein said bag-insert mechanism includes a plurality of gripping posts for releasably engaging said packaging bag to maintain said open end of said packaging bag in communication with a drip tray in said evacuation chamber.

44. The vacuum packaging appliance of claim 39, wherein said bag-insert mechanism includes receiving indentations corresponding to said plurality of gripping posts for releasably engaging said packaging bag to maintain said open end of said packaging bag in communication with said drip tray in said evacuation chamber.

45. The vacuum packaging appliance of claim 39, wherein said bag-insert mechanism includes two flap portions connected by a hinge mechanism, wherein said flap portions are rotatably movable about said hinge mechanism between an open and a closed position.

46. The vacuum packaging appliance of claim 39, wherein said bag-insert mechanism is removable from said evacuation chamber.

47. The vacuum packaging appliance of claim 39, wherein said bag-insert mechanism includes curved edges for easy removal from said evacuation chamber.

48. The vacuum packaging appliance of claim 39, wherein said bag-insert mechanism is integrated with said evacuation chamber.

49. The vacuum packaging appliance of claim 39, wherein said bag-insert mechanism is integrated with a removable drip tray associated with said evacuation chamber.

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