A method for adhering a multi-layer control device to a receptacle and releasing air pressure is also provided.

The invention relates to a multi-layer control device having a plurality of layers, each layer having a predetermined function. The base layer has an opening to allow the expulsion of air within a receptacle while maintaining a seal from the outside environment. The interaction between the base layer and the baffle layer facilitates the release of air under pressure.

Claims:

Claims are presented for the invention, including claims for the method of adhering the device to a receptacle, the multi-layer control device itself, and the multi-layer structure comprising the device.

Abstract:

A multi-layer control device comprising an adhesive layer, a base layer provided over the underlayer of adhesive, a baffle layer having a resealable section and a remainder section. The resealable section is able to detach from the remainder section of the baffle layer. The base layer has an opening to allow the expulsion of air within a receptacle while maintaining a seal from the outside environment. The interaction between the base layer and the baffle layer generates static energy. A method for adhering a multi-layer control device to a receptacle and releasing air pressure is also provided.

Title:

VALVE PROVIDING RESISTANT SEAL AND AIR EXPULSION IN A RECEPTACLE

FIG. 1

A diagram illustrating the multi-layer control device is shown, with labeled sections indicating the different layers and their interactions.
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VALVE PROVIDING RESISTANT SEAL AND AIR EXPULSION IN A RECEPTACLE

Cross-Reference to Related Application

[0001] The present application claims the benefit of U.S. Provisional Application No. 61/310,740 filed March 5, 2010, which is incorporated herein by reference in its entirety.

Field of the Invention

[0002] The present invention relates to valves. More specifically, the present invention relates to valves that provide a hermetic or water resistant seal but allow for the release of air pressure.

Background of the Invention

[0003] A common problem with consumer or industrial packaging is excess air inside the receptacle. Often, it is desirable for a receptacle to provide a dry environment as well as to allow for air expulsion during package distribution, so that packages can be shipped flat and more packages can be fit within the trailer or rail car. In order to provide such an environment for a product, receptacles often times have small perforations, and must be kept in a dry environment in order to avoid water and moisture from entering the receptacle through the small perforations. Other receptacles use a complex and costly system to allow for air expulsion while limiting exposure to moisture. Existing products use a multi-walled paper bag that must be kept away from moisture prior to use. However, if the paper-bag is
exposed to moisture or water, the receptacle no longer provides the desired environment for a product, and proves to be ineffective, due to saturation.

[0004] A system that is cost effective is desired by both consumers and manufactures. The package must be one that is beneficial to both parties. A decrease in cost would benefit the manufacturer and would result in an increase in the production of the systems. In turn, there would be an increased availability of such systems benefitting consumers.

[0005] Retailers also desire a system that provides a “low profile” valve that is thin and capable of resembling a label when adhered to a package. A low profile valve is less noticeable to the consumer on the packaging, and is capable of being attached to a package as a form filled seal. A form filled seal is a package constructed out of a roll of film, and is a method of package construction utilized by manufacturers because of its lower cost. With a thinner valve, a retailer would be able to purchase a roll of film for the form filled seal method with valves already attached to the film.

[0006] The elimination of air from the interior of the receptacle allows for optimum storage conditions as well as a decrease in volume of the receptacle allowing for easier transportation and handling of the receptacle, and a decrease in the degradation of the product such as a change in the product's chemical composition. In order to provide the elimination of air from the interior of a receptacle, air release valves and/or special bag constructions have been utilized. However, such valves and constructions can complicate the bag-making process and increase production costs. It is often desirable to reseal the air release valve so as to maintain the evacuation of the receptacle.

[0007] A wide-range of various products in the consumer marketplace would benefit from a receptacle that efficiently provides for both a dry environment and the release of air pressure. Examples of such a range for a product range from pet food to dry chemicals and grout or concrete.
It is evident that there is a current need in the marketplace for a receptacle that provides both a dry environment while at the same time allowing for air expulsion from the receptacle, in addition to one that can be effectively produced and applied to a receptacle at a lower cost.

**Brief Summary of the Invention**

The embodiments of the present invention described below are not intended to be exhaustive or to limit the invention to the precise forms disclosed in the following detailed description. Rather, the embodiments are chosen and described so that others skilled in the art may appreciate and understand the principles and practices of the present invention.

In accordance with one embodiment of the present invention, a multi-layer control device on a receptacle in which the device provides a hermetic or water resistant seal while still allowing an unwanted component to be released from the receptacle. The multi-layer control device provides for resealability once an unwanted component has been released or expelled from the receptacle. The multi-layer control device may be attached to a variety of receptacles thus accommodating a wide-range of products. It is also possible to construct the valve and the receptacle at different locations.

In accordance with one embodiment, a one-way valve is disclosed which allows for air expulsion from a receptacle but does not allow water or moisture into the interior of a receptacle. The valve includes an adhesive layer adhered to a receptacle, a base layer with an opening through which air is expelled, and a baffle layer that is divided into sections with one section that is releasable and separable from the remainder of the baffle. The baffle layer has a plurality of perforations allowing the flow of unwanted components.
[0012] The flow of unwanted components through the perforated baffle layer creates pressure that results in the separation of the resealable section of the baffle layer from the remainder of the baffle layer and the unhinging of the resealable section of the baffle layer from the base layer. The unhinged resealable section of the baffle layer is able to re-seat itself in order to maintain air evacuation of the receptacle.

[0013] In accordance with a further embodiment of the present invention, a permeable layer of material is provided over the under layer of adhesive covering an opening in the adhesive layer. This additional layer would allow particulates to remain inside the interior of the receptacle while keeping liquids and unwanted contaminants on the exterior of the container from entering the interior of the receptacle.

[0014] In accordance with another embodiment of the present invention, a possible method for attaching a multi-layer control device to a receptacle and releasing air pressure from the receptacle is provided. By applying pressure to the receptacle, air flows through the opening in the base layer and then navigates its way out of the perforations in the baffle layer portion. The resealable section of the baffle layer unhinges from the base layer and separates from the remainder section of the baffle layer in order to facilitate the flow of air out of the interior of the receptacle.

[0015] In accordance with a further embodiment of the present invention, a multi-layer control device having a selectively activated seal adhesive layer. The seal adhesive layer upon activation by heat, pressure, or radiation forms a tight seal against the outside environment.

[0016] In accordance with another embodiment a multi-layer control device having a continuous top layer and a layer of flexible material capable underneath the cover layer is provided. The flexible material facilitates the expulsion of air from the interior of the receptacle.

[0017] Other features and advantages of the present invention will become apparent to those skilled in the art from the following detailed description. It is to be understood, however, that the
detailed description of the various embodiments and specific examples, while indicating preferred and other embodiments of the present invention, are given by way of illustration and not limitation. Many changes and modifications within the scope of the present invention may be made without departing from the spirit thereof, and the invention includes all such modifications.

**Brief Description of the Drawings**

[0018] These, as well as other objects and advantages of this invention, will be more completely understood and appreciated by referring to the following more detailed description of the presently preferred exemplary embodiments of the invention in conjunction with the accompanying drawings, of which:

[0019] FIGURE 1 depicts a sectional view of a multi-layer control device;

[0020] FIGURE 2 illustrates method steps for adhering a multi-layer control device to a receptacle and releasing air pressure from the receptacle;

[0021] FIGURE 3 depicts a frontal view of a one-way valve attached to a receptacle;

[0022] FIGURE 4 depicts a sectional view of a multi-layer control device having a selectively activated seal adhesive layer; and

[0023] FIGURE 5 depicts a sectional view of a multi-layer control device having a pliable material layer.

**Detailed Description of the Invention**

[0024] The present invention is now illustrated in greater detail by way of the following detailed description which represents the best presently known mode of carrying out the invention. However, it should be understood that this description is not to be used to limit the present invention, but rather, is provided for the purpose of illustrating the general features of the invention.
Referring now to the Figures and initially to Figure 1, a multi-layer control device 10 that provides an effective seal while still enabling the expulsion of unwanted components 60 from a receptacle to which the device 10 is attached, is disclosed. The multi-layer control device 10 includes a patterned under layer of adhesive 20 forming an opening 21. The adhesive has a top face 63 and a bottom face 62. A permeable layer 11 may be included and has a top face 13 and a bottom face 12 provided over the top face 63 of the adhesive layer 20. The permeable layer 11 covers the opening and the patterned under layer of adhesive 20. A base layer 30 is provided over the permeable layer 11. The base layer has a top face 31 and bottom face 32 with the bottom face 32 adhered to the top face 13 of the permeable layer 11 and the top face 31 of the base layer 30 attached to a top baffle layer 40. The baffle layer includes a plurality of perforations 84 which are sized to as to prevent particulate matter from escaping from the package.

The baffle layer 40 is divided into a resealable section 86 and a remainder 85 section, with the remainder section 85 having a leading end 34 and a trailing end 33. The resealable section 86 has a leading end 35 and a trailing end 36 with the trailing end 33 of the remainder section 85 being attached to the leading end 35 of the resealable section 86. The leading end 35 of the resealable section 86 of the baffle layer 40 has the ability to releasably detach from the trailing end 33 of the remainder section 85 of the baffle layer 40 and the leading end of the resealable section 86 is able to unhinge from the base layer 30. The remainder section 85 remains attached to the base layer 30. The base layer 30 has an opening 70 to allow for the expulsion of unwanted elements 60 (e.g. fluid, gas, solvents, moisture, etc.) through the base layer 30 continuing through the perforated baffle layer 40. The interaction of the base layer 30 and resealable layer 40 generates energy to retain the sealing of the assembly, the energy is static energy.

The under layer of adhesive 20 in an exemplary embodiment is a pressure sensitive adhesive. The adhesive may also be a form of microsphere pressure sensitive adhesive. The adhesive
may also be a form of an epoxy adhesive which is a versatile adhesive that can be used to join a variety of materials. Additionally, polyvinyl acrylate and toughened acrylics would also serve as suitable adhesives for the present invention. The under layer of adhesive 20 of the multi-layer control device 10 may be attached to a release liner before attachment of the device to a receptacle 210.

[0028] In a further exemplary embodiment of the present invention, the permeable layer 11 is moisture resistant. The permeable layer can be a non-woven material broadly defined as a porous sheet or web structure bonded together by entangling fibers or filament of the material. Non-woven materials provide specific functionality such as absorbency, liquid repellency, resilience, stretch, softness, and sterility. One exemplary material is non-woven material is constructed from a polyester such polyethylene terephthalate (PET), cotton, or other synthetic or natural layers. Alternatively, the permeable layer 11 can be a perforated film or more specifically an apertured film. An apertured film has a plurality of openings that are generally circular. However various geometric shapes of the openings in the apertured film are contemplated by the present invention. A perforated film permits oxygen to enter a receptacle's interior while keeping other undesirable components such as moisture and certain bacteria out of the receptacle's interior. This construction enables a retailer to expose the contents of the interior of the receptacle to oxygen while preventing contamination from moisture.

[0029] In an exemplary embodiment, the base layer 30 is constructed out of a polyester preferably polyethylene terephthalate (PET). PET is a semi-rigid to rigid polyester that is proven to form a good barrier to moisture, gas, alcohol, and solvents in general. The base layer 30 includes an opening 70. The opening 70 allows pressure buildup to escape from the receptacle 210 through the base layer 30 and then through the perforations 84 in the baffle layer 40.

[0030] Pressure buildup of the unwanted component 60, will cause the leading end 35 of the resealable section 86 of the baffle layer to detach from the trailing end 33 of the remainder section
85 of the baffle layer 40 and the leading end 35 of the resealable section 86 to unhinge from the base layer 30. The remainder section 85 of the baffle layer remains adhered to the base layer 30.

[0031] The unhinged leading end 35 of the resealable section 86 of the baffle layer 40 allows the release of pressure from the receptacle 210. Once the expulsion of the unwanted component 60 is complete, the unhinged leading end 35 of the resealable section 86 of the baffle layer 40 will re-seat itself onto the base layer 30 and the leading end 35 of the resealable section will reattach to the trailing end 33 of the remainder section 85 of the baffle layer 40 providing a reusable, cost-effective multi-layer control device 10 for the packaging industry.

[0032] The interaction of the base layer 30 and the baffle layer 40 generates a form of energy namely static energy. The static energy results in a maintainable seal from the outside environment, keeping the interior of the receptacle free from unwanted outside components. The baffle layer 40 in an exemplary embodiment is a 6 millimeter vinyl, and in order to promote a static energy interaction, the vinyl base layer 30 is treated with a static cling treatment.

[0033] In one embodiment of the present invention, a fastening device may be utilized in order to keep the baffle layer adhered to the remainder of the baffle layer 40 and prevent unwanted unhinging of the resealable section 86 of the baffle layer 40. A fastening device can be utilized after the resealable section 86 of the baffle layer 40 unhinges from the base layer 30 and re-seats after expulsion, in order to ensure and maintain the resealable sections 86 re-seating to the base layer. An example of a fastening device that may be utilized is a tie. The number of fastening devices may be increased in order to provide further support.

[0034] Another embodiment of the present invention provides for a weighted tip on the trailing end 33 of the remainder section 85 of the baffle layer 40 and a weighted tip on leading end 35 of the resealable section 86 of the baffle layer 40.
Referring now to Figure 2, a method is provided for adhering a multi-layer control device 10 to a receptacle 210 and releasing air pressure 60 from the receptacle. First, a receptacle 210 is provided at step 100. Second, a multi-layer control device 10 is provided that includes a patterned underlayer of adhesive 20 with the patterned underlayer of adhesive 20 forming an opening 21. The underlayer 20 of adhesive has a top 63 and bottom face 62 with the bottom face 62 of the adhesive layer 20 being adhered to a release liner. The top face 63 of the adhesive layer 20 is adhered to a permeable layer 11 which has a top face 13 and a bottom face 12 that covers the opening 21 in the adhesive layer 20, a PET base layer 30 has an opening 70 to allow the expulsion of air 60 from the receptacle 210. The base layer 30 has a top 31 and bottom face 32 with the bottom face 32 being adhered to the top face 13 of the permeable layer 11, and the top face 31 of the PET base layer 30 is adhered to a baffle vinyl layer 40. The baffle layer 40 has a plurality of perforations 84 with the baffle layer 40 being divided into a releasable section that has a leading end 35 and trailing end 36. The baffle layer 40 includes a remainder section that has a leading end 34 and a trailing end 33 with the leading end 35 of the releasable section 86 being able to detach from the trailing end 33 of the remainder section 85 of the baffle layer 40. The releasable section 86 of the baffle layer 40 unhinges from the base layer 30 while the remainder section 85 of the baffle layer 40 remains attached to the base layer 40. The interaction between the PET base layer 30 and the vinyl baffle layer 40 results in the generation of static energy at step 110.

Next, the release liner is removed from the bottom face 62 of the adhesive layer 20, which allows the exposure of adhesive 120. The multi-layer control device 10 is then adhered to the receptacle 210, at step 120. Lastly, pressure is applied to the receptacle 210 causing air to buildup within the interior of the receptacle 210, at step 130.

Air passes through the opening 70 in the PET base layer 30 resulting in the formation of air pockets in the vinyl baffle layer 30. The buildup of pressure causes the leading end 35
of the resealable section 86 of the baffle layer 40 to detach from the trailing end 85 of the remainder section 85 of the baffle layer 40 and to unhinge from the base layer 30 thereby releasing the air pressure 60. Once expulsion is complete, the leading end 35 of the resealable section 86 of the baffle layer 40 can be reattached to the trailing end 33 of the remainder section 85 of the baffle layer 40 re-initiating the interaction between the resealable portion 86 of the baffle layer 40 and the base layer 30, the interaction generating static energy. The generation of static energy after the resealable section 86 of the baffle layer 40 has re-seated back down on the base layer 30, results in a further seal against the outside environment. Thus, the multi-layer controller device 10 can and be opened and closed numerous times while still maintaining a sufficient seal that keeps unwanted elements outside the receptacle out of the receptacle's interior due to the static energy produced by the interaction between the baffle layer 40 and the base layer 30 and the resulting cling that holds the layers temporarily together.

[0038] Another embodiment, allows a fastening device to keep the resealable portion 86 of the baffle layer 40 attached to the remainder portion 85 of the baffle layer 40 while still allowing air flow 60. In this embodiment, air or another unwanted component 60 will flow out of the receptacle 210 through the opening 70 the base layer 30 and pressure will form underneath the baffle layer 30 until the perforations 84 throughout the baffle layer 40 allow the air or unwanted component 60 to be released. The air or other unwanted components are pushed out in "waves" through the perforations.

[0039] Figure 3 provides another embodiment in which the multi-layer control device 10 is a one-way valve. The one-way valve includes an underlayer of adhesive 20 that has a top face 63 and a bottom face 62 which is adhered to a receptacle 210. A base layer 30 provided over the underlayer of adhesive 20 which has a top face 31 and bottom face 32 with the bottom face 32 of the base layer 30 being adhered to the top face 63 of the adhesive layer. The top face 31 of the base layer 30 is adhered to a baffle layer 40. The baffle layer 40 has a plurality of perforations 84 and is divided into a resealable section 86 that has a leading end 35 and a trailing end 36 and a remainder section 85 that has a leading
end 34 and a trailing end 33. The leading end 35 of the resalable section 86 is able to detach from the trailing end 33 of the remainder section 85 of the baffle layer 40 and unhinge from the base layer 40. The base layer 30 has an opening 70 to allow for the expulsion of air 60 within the receptacle 210, and the interaction between the base layer 30 and the baffle layer 40 generates static energy.

[0040] The seal produced by the energy resulting from the interaction between the base layer 30 and the baffle layer 40 has been subjected to water submersion testing. Exposure to water resulted in the maintenance of a dry seal lasting greater than 72 hours. This is an improvement over other prior art solutions.

[0041] It is contemplated by this invention that receptacles provided with a low profile valve of the present invention may be produced as a result of vertical form fill application, a type of automated packaging system commonly used in packaging food in which the machine constructs receptacle out of a flat roll of film while simultaneously filling the receptacle with a desired amount of product. Additionally, a low profile valve of the present invention may also be used in a seal film application which is primarily used in food packaging.

[0042] In another embodiment of the present invention illustrated by Figure 4, a separate seal adhesive layer of pressure sensitive adhesive is added to multi-layer control device 10 of Figure 1. The seal adhesive layer 90 has a bottom face 91 that is adhered to the top face 31 of the base layer 30 and the top face 92 of the seal adhesive layer 90 which is adhered to the vinyl baffle layer 40. The seal adhesive layer 90 of pressure sensitive adhesive must be activated by applying heat, radiation or pressure which acts on the exterior of the multi-layer control device 10 in order to form a seal. Prior to activation of the seal adhesive layer 90, the leading end 35 of the resealable section 86 of the baffle layer 40 is in a first position in which the leading end 35 of the resealable section 86 is unable to sit on the top face 92 of the seal adhesive layer 90 allowing components 60, such as air, to escape from the interior of the receptacle 210. Upon activation of the seal adhesive layer, however, the leading end 35
of the resealable section 86 of the baffle layer 40 enters a second position where it is able to sit down on
the top face 92 of the sealing adhesive layer 90 and attach to the trailing end 33 of the remainder
section 85 of the baffle layer 40. As a result of the activation of the seal adhesive layer 90, the multi-
layer control device 10 is provides a closed and a tight seal.

[0043] In one embodiment, the seal adhesive layer 90 is constructed out of a heat activated
pressure sensitive adhesive. However, the seal adhesive layer 90 may also be constructed out of a dry
heat sealable adhesive, a temperature resistant dry cohesive, or a radiation cured dry adhesive, or two
components of an adhesive which will activate or cure upon exposure to radiation.

[0044] In a further embodiment of the invention as illustrated by FIG 5, in which a multi-
layer device 300 allows the expulsion of air 360 or other unwanted components from the interior of a
receptacle. The receptacle has a continuous, top cover layer 350. The cover layer 350 has a top 351 and
bottom 352 face and may be embossed. The bottom face 352 of the cover layer 350 sits on a layer of
pliable or resilient material 340 that has a top 341 and bottom 342 face. Variable materials are suitable
such as a sponge, or a form of spring or biased mechanism. The bottom face 342 of the layer of material
layer 340 is attached to a base layer 330 that is provided over a layer of adhesive 320. The layer of
adhesive 320 could be a permanent pressure sensitive adhesive to allow for bonding between the valve
and the exterior of a package. The base layer 330 has an opening 370 for the expulsion of air 360 or
other components within the interior of a receptacle.

[0045] When air 360 or other components flow through the opening 370 in the base layer
330, the air will push up on the material layer 340 moving the pliable material layer 340 into a first
position while the bottom layer 342 of the pliable material layer 340 detaches from the base layer 330
and floats in between the base layer 330 and the top cover layer 350. This allows air to flow out of a
limited number of perforated sections 361 in the top cover layer 350. During the expulsion of air, and
while the bottom face 342 of the layer of material 340 is detached from the base layer 330 the top cover layer 350 takes a convex shape.

[0046] Once expulsion is complete the layer of material 340 moves into a second position so that the bottom face 342 of the layer of material 340 will sit down on the base layer 330 forming a seal. The top cover layer 350 may deform, pushing the layer of pliable material 340 into the opening in the base layer 370 taking on a concave shape. In one embodiment the pliable material 240 may be pushed a half inch (1/2") into the opening in the base layer 370. If a spring mechanism is provided as the form of pliable material 340, manual pressure by pushing down on the multi-layer control device 300 may be used to allow for the expulsion of air and to stop the expulsion of air as desired. This embodiment of the present invention enables users to expell unwanted air or other components while still maintaining package integrity. It also enables users to decrease the volume of the package allowing for easier storage of the container.

[0047] It is also contemplated by a further embodiment, that a layer of adhesive is provided between the base layer and layer of material. The adhesive may be a form of temporary, removable adhesive or a possible light tack adhesive. The adhesive in one embodiment may be a printable pressure sensitive adhesive to allow for a light bond between the layer of material 340 and the top cover layer 350 resulting in a hermetic seal.

[0048] In an additional embodiment, a plug may be utilized fitting into the opening 70 in the base layer 30. The plug is adhered to the bottom face of the top cover layer 40. The plug may be formed from any suitable material, which may be placed into the opening to complete the seal.

[0049] In another embodiment, air channels extending outward from the valve may be utilized to allow for the expulsion of air or other unwanted components. As the layer of material 340 is pushed into the opening in the base layer 370 the excess air or other unwanted components from
existing between the top cover layer and the material are pushed out via the air channels made in the base layer and/or the adhesive layer 320.

[0050] In one embodiment a single application of the valve could exceed 100 MM units annually.

[0051] In another embodiment contemplated by the present invention, a layer of pliable material 340 is not utilized. Instead the top cover layer 350 is pushed into the opening in the base layer 370 rather than a separate layer of material. The cover layer may be made of a flexible, pliable material so that it is capable of deformation. Air channels may also be utilized in order to expel air and other unwanted materials from the interior of the package.

[0052] In a contemplated embodiment, a plug is adhered to a portion of the bottom face of the baffle layer 40. In order to expel components 60 from a receptacle's interior, the leading end 35 of the resealable section 86 of the top baffle layer 40 detaches from the trailing end 33 of the remainder section 85 of the baffle layer 40 and unhinges from the top face 31 of the base layer 30. As the leading end 35 of the resealable section 86 unhinges, the plug is removed from the opening 70 in the base layer resulting in the expulsion of unwanted components from the receptacle's interior. Once expulsion is complete, the leading end 35 of the resealable section 86 of the baffle layer 40 reattaches to the trailing end 33 of the remainder section 85 of the baffle layer 40 and sits back down on the top face of the base layer 30, re-inserting the plug into the opening 70 of the base layer.

[0053] Another embodiment considered by this invention is a two-way valve. A two-way valve when subjected to water submersion testing resulted in the seal lasting one hour.

[0054] It will thus be seen according to the present invention a highly advantageous multi-layer control device has been provided. While the invention has been described in connection with what is presently considered to be the most practical and preferred embodiment, it will be apparent to those of ordinary skill in the art that the invention is not to be limited to the disclosed embodiment, and
that many modifications and equivalent arrangements may be made thereof within the scope of the invention, which scope is to be accorded the broadest interpretation of the appended claims so as to encompass all equivalent structures and products.

[0055] The inventors hereby state their intent to rely on the Doctrine of Equivalents to determine and assess the reasonably fair scope of their invention as it pertains to any apparatus, system, method or article not materially departing from but outside the literal scope of the invention as set out in the following claims.
What **is claimed** is:

1. A multi-layer control device, comprising:
   - an underlayer of adhesive having a top face and a bottom face,
   - a base layer provided over the underlayer of adhesive and having a top and bottom face, the bottom face is adhered to the top face of the adhesive layer and the top face is adhered to a baffle layer having a plurality of perforations;
   - the baffle layer is divided into a resealable section having a leading end and a trailing end and a remainder section having a leading end and a trailing end;
   - the leading end of the resealable section is separable from the trailing end of the remainder section of the baffle layer and the leading end of the releasable section unhinges from the base layer while the remainder section remains attached to the base layer;
   - the base layer has an opening for the expulsion of air within a receptacle; and
   - wherein the interaction between the base layer and baffle layer forms a static cling seal.

2. The multi-layer control device of claim 1, wherein the leading end of the resealable section and the trailing end of the remainder section have weighted tips.

3. The multi-layer control device of claim 1, wherein a permeable layer is adhered to the top face of the adhesive layer and the bottom face of the base layer.
4. The multi-layer control device of claim 1, wherein the adhesive is a pressure sensitive adhesive.

5. The multi-layer control device of claim 1, wherein the control device is a one-way valve.

6. The multi-layer control device of claim 1, wherein the base layer is polyethylene terephthalate.

7. The multi-layer control device of claim 1, wherein the multi-layer control device is water-resistant.

8. The multi-layer control device of claim 1, wherein the multi-layer control device is hermetic.

9. The multi-layer control device of claim 1, wherein pressure releases the unwanted components from the receptacle.

10. A one-way valve, comprising:
    
    an underlayer of adhesive having a top face and a bottom face with the bottom face is adhered to a receptacle;
    
    a base layer provided over the underlayer of adhesive having top and bottom faces with the bottom face adhered to top face of the adhesive layer and the top face of the base layer is adhered to a baffle layer having a plurality of perforations;
the baffle layer is divided into a resealable section having a leading end and a trailing end and a remainder section having a leading end and a trailing end;

the leading end of the resealable section of the baffle layer detaches from the trailing end of the remainder section of the baffle layer and the leading end of the resealable section unhinges from the base layer and the remainder section remains attached to the base layer; and

wherein the base layer has an opening to allow the expulsion air within the receptacle and the interaction between the base layer to the baffle layer generates static energy.

11. The one-way valve of claim 10, wherein the adhesive is a removable pressure sensitive adhesive.

12. The one-way valve of claim 10, wherein the realeasable layer is weighted.

13. The one way valve of claim 10, wherein the baffle layer unhinges upon sufficient air pressure within the receptacle and then reseals once air pressure is released from the receptacle.

14. The one way valve of claim 10, wherein a plug that is able to fit into the opening of the base layer is attached to the bottom face of the baffle layer.

15. A method for adhering a multi-layer control device to a receptacle and releasing air pressure from the receptacle, comprising the steps of;

providing a receptacle having an opening;

providing a multi-layer control device that includes;
a patterned underlayer of adhesive provided over the opening in the receptacle and having a top and bottom face, the bottom face of the adhesive layer is adhered to a release liner and the top face of the adhesive layer is adhered to a permeable layer having a top and bottom face and covering the opening in the receptacle;

a PET base layer having an opening to allow expulsion of air from the receptacle and having a top and bottom face with the bottom face is adhered to the top face of the permeable layer and the bottom face adhered to a baffle vinyl layer, the vinyl layer having a plurality of perforations,

the baffle layer is divided into a releasable section having a leading end and a trailing end and a remainder section having a leading end and a trailing end, the leading end of releasable section of the baffle layer detaches from the trailing end of the remainder section of the baffle layer and the leading edge of the releasable section unhinges from the base layer and the remainder section remains attached to the base layer, the adhesion of the PET base layer to the vinyl baffle layer generates static energy to form a seal;

removing the release liner from the bottom face of the adhesive layer;

adhering the multi-layer control device to the receptacle;

applying pressure to the receptacle such that air flows through the opening in the PET base layer and through the perforations in the vinyl layer;

forming a plurality of air pockets in the vinyl layer;

detaching the leading end of the releasable section from the trailing end of the remainder section of the vinyl layer and the leading end of the releasable section unhinges from the PET base layer while the remainder section of the vinyl layer remains attached to the PET base layer; and
expelling air so that the leading end of the resealable section of the vinyl layer re-seats on the PET base layer and re-attaches to the trailing end of the remainder section of the vinyl layer such that the vinyl layer and the PET base layer interact to generate static energy resulting in a seal.

16. A multi-layer control device, comprising:

a base layer having an opening for the expulsion of air within a receptacle;

a patterned underlayer of pressure sensitive adhesive forming an opening having a top face and a bottom face;

a permeable layer having a top and bottom face, the bottom face of the permeable layer is adhered to the top face of the pressure sensitive adhesive layer and the top face of the permeable layer is adhered to a base layer having a top and bottom face;

a seal adhesive layer of pressure sensitive adhesive having a top and bottom face wherein the bottom face of the seal adhesive layer is adhered to the top face of the base layer and the top face of the seal adhesive layer is adhered to a baffle layer having a plurality of perforations;

the seal adhesive layer sealing upon activation by a factor acting on the exterior of the multi-layer control device;

the baffle layer is divided into a resealable section having a leading end and a trailing end and a remainder section having a leading end and a trailing end;

the leading end of the resealable section of the baffle layer moving to a first position in order to expel unwanted components from a receptacle's interior such that the leading end of the resealable section of the baffle layer is separable from the trailing end of the remainder section of the baffle layer and the leading end of the releasable section of the baffle layer unseats from the top face of the seal adhesive layer while the remainder section of the baffle layer remains attached to the top face of the seal adhesive layer; and
the leading end of the resealable section of the baffle layer moving to a second position once the seal adhesive layer is activated by a factor acting on the exterior of the multi-layer control device such that the leading end of the resealable section of the baffle layer attaches to the trailing end of the remainder section of the baffle layer and sits down on the top face of the seal adhesive layer forming a seal.

17. The multi-layer control device of claim 16, wherein the pressure sensitive adhesive is a heat activated pressure sensitive adhesive.

18. The multi-layer control device of claim 16, wherein the adhesive is a dry heat sealable adhesive.

19. The multi-layer control device of claim 16, wherein the adhesive is a radiation cured dry adhesive.

20. A multi-layer control device comprising:

a cover layer having a top and bottom face with the cover layer having a number of perforated segments;

the bottom face of the cover layer sits on a layer of material having a top and bottom face with the bottom face of the layer of material attached to a base layer;

the base layer having an opening providing for the expulsion air from an interior of a receptacle, and the base layer is provided over a layer of adhesive;
the layer of material having a first position in which the layer of material is unseated from the base layer allowing air to be expelled from the receptacles interior through the perforated segments of the cover layer and the cover layer takes on a convex shape in the first position;

the layer of material having a second position in which the layer of material sits down on the base layer forming a seal once expulsion of air from the receptacle's interior is complete and the cover layer pushing the material layer into the opening in the base layer, the cover layer taking on a concave shape in the second position.
FIG. 1

FIG. 2

PROVIDING A RECEPTACLE HAVING AN OPENING.
PROVIDING A MULTI-LAYER CONTROL DEVICE OVER THE OPENING.

100

REMOVING THE RELEASE LINER FROM THE BOTTOM FACE OF THE ADHESIVE LAYER OF THE MULTI-LAYER CONTROL DEVICE.

110

ADHERING THE MULTI-LAYER CONTROL DEVICE TO THE RECEPTACLE.

120

APPLYING PRESSURE TO THE RECEPTACLE TO CAUSE AIR FLOW THROUGH THE OPENING IN THE BASE LAYER.

130
FIG. 3

FIG. 4

SUBSTITUTE SHEET (RULE 26)