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(54) **EVACUABLE FIREARM ENCLOSURE**

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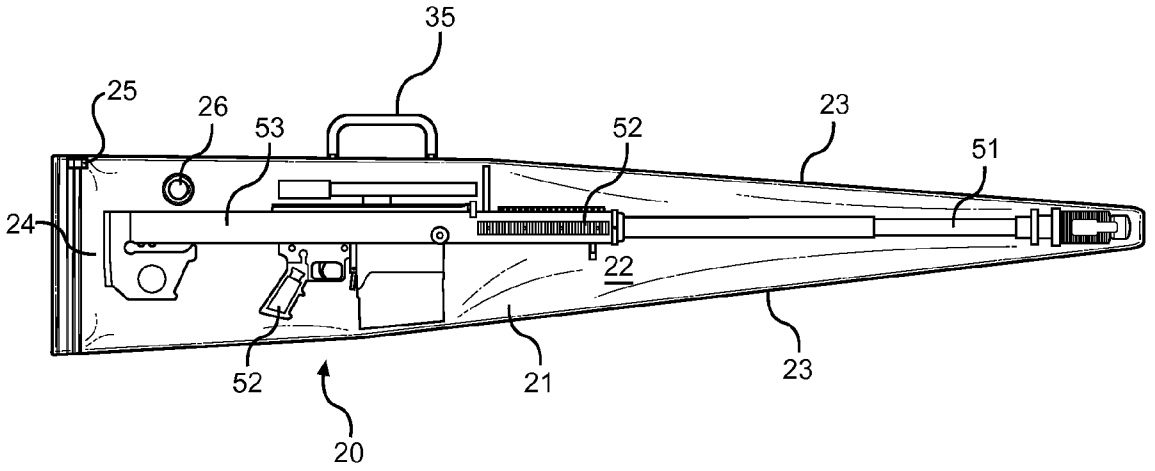
(57) **ABSTRACT**

The present invention provides a reusable, evacuable enclosure for a firearm designed to prevent corrosion and contamination to firearms and a method of using the same. The enclosure includes a storage bag having a front portion and a back portion enclosed at its edges with an open end providing access to an interior volume therebetween. The open end includes a fastener designed to operably seal the open end and the interior volume. The front portion includes a valve assembly having a valve base and a centrally located flange extending therefrom forming an opening therethrough that provides air passage to the interior volume. A vacuum source is placed against the centrally located flange to evacuate excess air from the interior volume through the opening. The opening is covered by a spring-biased diaphragm hingedly attached within the opening designed to allow air to pass through the opening in only one direction.



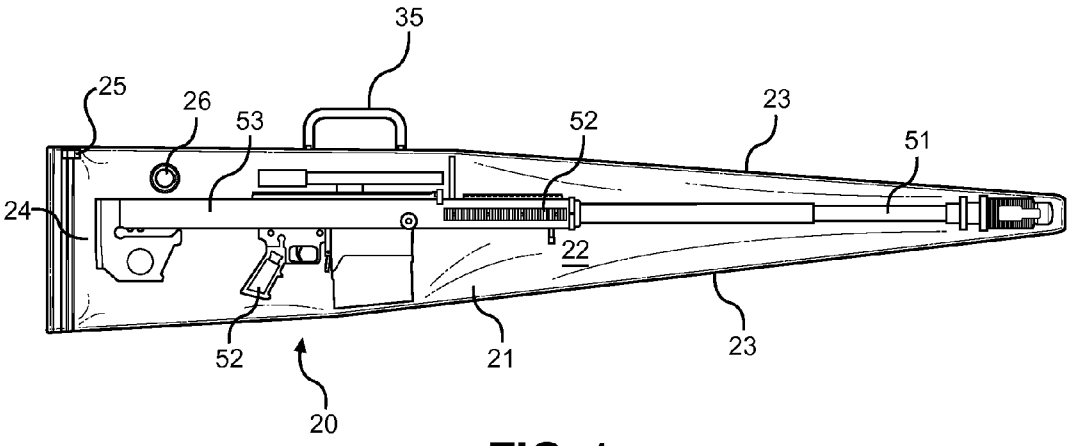


FIG. 1

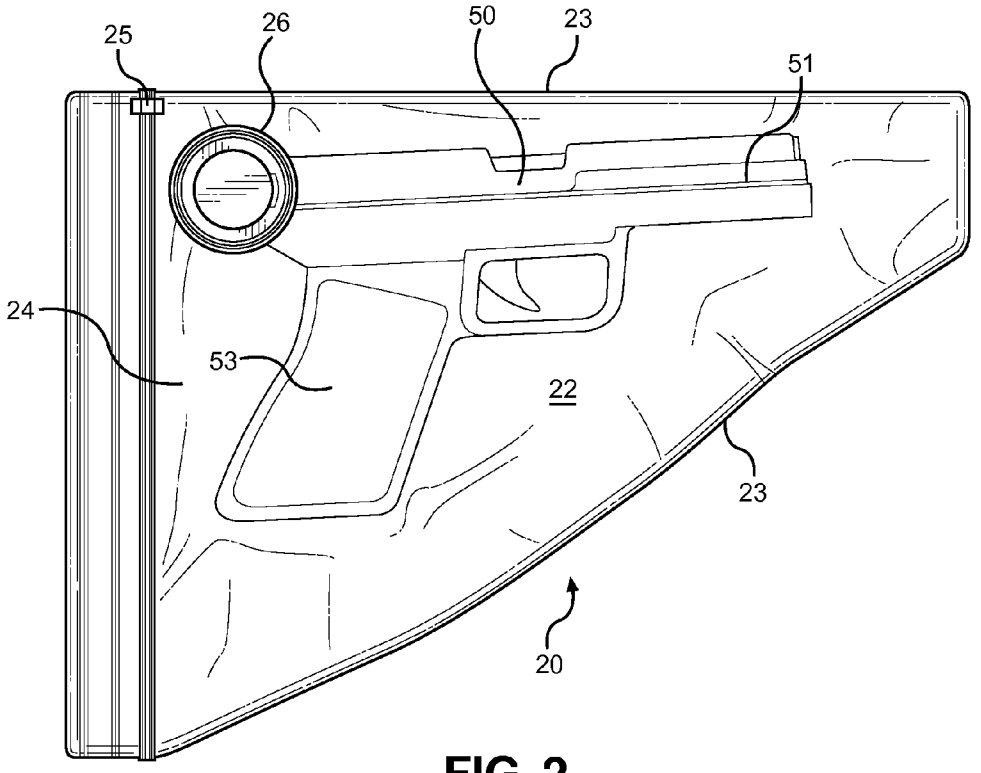


FIG. 2

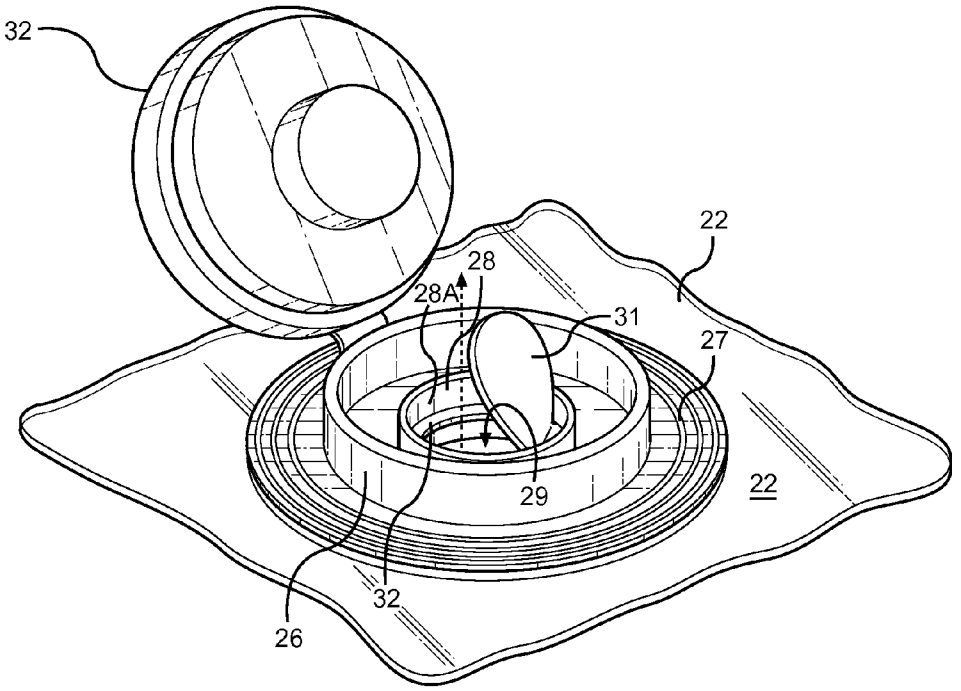


FIG. 3

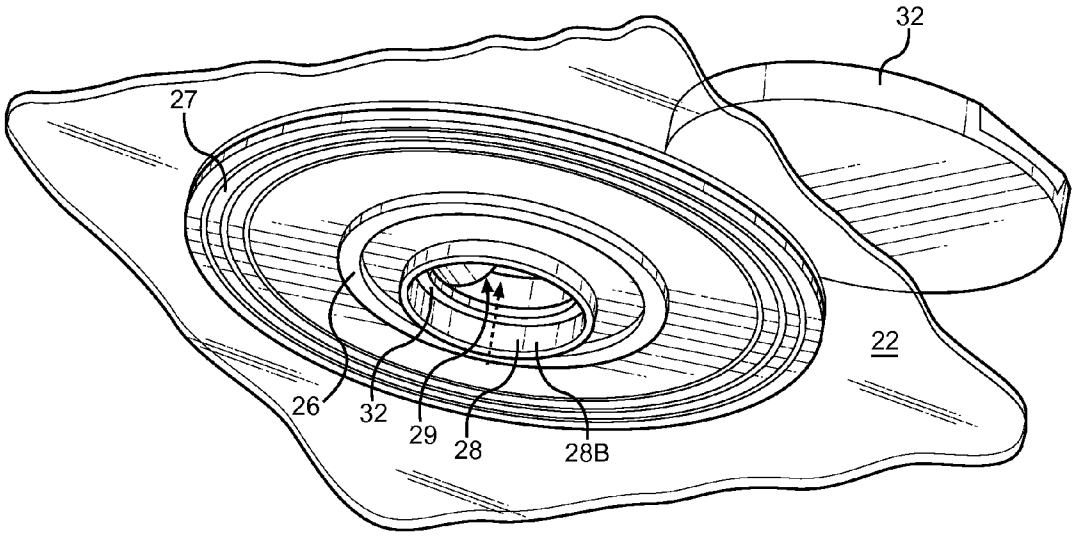


FIG. 4

EVACUABLE FIREARM ENCLOSURE

CROSS REFERENCE TO RELATED APPLICATION

[0001] This application claims the benefit of U.S. Provisional Application No. 61/925,751 filed on Jan. 10, 2014. The above identified patent application is herein incorporated by reference in its entirety to provide continuity of disclosure.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention relates to firearm care and maintenance. More specifically, the present invention pertains to an improved storage device for firearms that is vacuum-sealed and prevents corrosion and other contamination to an enclosed firearm. The present invention provides a reusable, evacuable enclosure comprising a storage bag with an open end and a valve assembly on a front portion of the bag.

[0004] Corrosion is the gradual degradation of materials by chemical reaction with its environment. In the most common use of the word, this means electrochemical oxidation of metals in reaction with an oxidant such as oxygen. Rusting, the formation of iron oxides, is well-known example of electrochemical corrosion. Since corrosion is caused through chemical interactions between metal and gases in the surrounding environment, moving the metal from, or changing the type of environment can immediately reduce metal deterioration. Sometimes this is as simple as limiting contact with rain or seawater, or using other methods to reduce the sulfur, chloride or oxygen content in the surrounding environment to limit the speed of metal corrosion.

[0005] There are certain protective measures that can be taken to keep a firearm rust-free when in storage. Three common methods of protecting firearms which can be done separately or in conjunction: (1) firearms can be coated with a corrosion proven inhibitor; (2) a storage bag can be used, (3) a storage unit should be moisture-free with a warming device or desiccants. Foam storage cases are not to be used as the foam attracts and retains moisture. Fleece bags can also protect firearms from dings and scratches. However, there is not a storage bag that removes excess air to inhibit the growth of bacteria, which may damage a firearm, and impervious to moisture, to inhibit the growth of mildew.

[0006] The present invention provides a reusable, evacuable enclosure comprising a triangular shaped storage bag with an open end providing access to an interior volume designed to receive a firearm. The open end includes a fastener designed to operably seal the open end and the interior volume. The storage bag further includes a valve assembly on a front portion of the bag. The valve assembly includes a valve base and a centrally located flange extending therefrom forming an opening therethrough that is configured to allow a vacuum source to evacuate excess air from the interior volume. The opening is covered by a spring-biased diaphragm hingedly attached within the opening designed to allow air to pass through the opening in only one direction.

[0007] 2. Description of the Prior Art

[0008] Devices have been disclosed in the prior art that relate to bags with zippers and vacuum-sealing mechanisms. These include devices that have been patented and published in patent application publications. Some of these devices disclose a plastic bag with a plastic zipper with a plastic slider equipped therewith to provide hermetic sealing. Other devices disclose a reusable enclosure with an opening for a one-way valve on the surface of the bag, which can remove excess air within the enclosure. These devices, however, do not disclose a storage bag operably sealed by a fastener on an open end and having a valve assembly. The foregoing is a list of devices deemed most relevant to the present disclosure, which are herein described for the purposes of highlighting and differentiating the unique aspects of the present invention, and further highlighting the drawbacks existing in the prior art.

[0009] Specifically, U.S. Published Patent Application Number 2011/0158561 to Kasai relates to a plastic bag body having a plastic zipper with a slider equipped therewith and added thereto a preventive function against unfairly sealing. The bag body comprises a bag made of two plastic films wherein both ends of which are welded together. The bag body further includes an opened portion having a plastic zip fastener that provides hermetic sealing. The Kasai device, however, does not provide a valve assembly.

[0010] Similarly, U.S. Pat. No. 5,480,030 to Sweeney is a container comprising a bag with an opening in which items can be placed, and a one-way valve on a surface of the bag. There is a hinged seal to seal the opening and excess air in the bag may be removed by placing a vacuum source against the valve. A cap is placed over the valve to ensure a permanent seal. The Sweeney device, however, does not provide a storage bag having a zip fastener to operably seal an open end and an interior volume.

[0011] U.S. Pat. No. 5,711,751 to Harmanoglu is a plastic bag manufacturing method to produce bags in side by side relation having an adhesive along a top edge of each bag with a removable release strip thereover and in an interposed position between overlying upper edges of a bag front panel and a bag rear panel. The bag front panel and the bag rear panel form an opening, wherein the removal of the release strip is adapted to provide closure for the opening. However, the Harmanoglu method does not provide a storage bag having a valve assembly or a zip fastener.

[0012] U.S. Published Patent Application Number 2009/0017239 to Ursino is a hermetically sealed plastic bag comprising a multi-layer heat shrinkable film folded to itself to form a flexible container with two closed edges, a closed bottom side edge, and an open top side. The multi-layer heat shrinkable film comprises a first outer heat-sealing layer, a second outer layer adhered to the first heat-sealing layer, and an internal layer having at least a blend of two resin components. However, the Ursino device fails to disclose a zip fastener or a valve assembly to evacuate excess air from a storage bag.

[0013] U.S. Pat. No. 7,614,203 to Oltrogge device relates to a valve feature for disposable, self-sealing storage bags that can be installed and removed to maintain an airtight seal. The valve assembly has a first portion comprising a housing that has a sealing surface and contains a valve mechanism. A second portion has a sealing surface that is configured to mate with the sealing surface of the first portion. The first and second portions are snapped together to form a substantially airtight seal to pierce through a plastic storage bag and air can be added or removed from the interior of the storage bag by the valve mechanism. However, the Oltrogge device does not disclose a zip fastener that is designed to operably seal an open end leading to an interior volume.

[0014] The devices disclosed in the prior art have several known drawbacks. These devices are limited as they do not provide a valve assembly designed to evacuate excess air from an interior volume of a storage bag and a zip fastener to operably seal an open end. The present invention overcomes these limitations by disclosing an evacuable enclosure comprising a triangular shaped storage bag having a front portion and a back portion enclosed on its outer edge thereof with an open end providing access to an interior volume therebetween. The open end includes a fastener, preferably a zip fastener, designed to operably seal the open end and the interior volume. The front portion comprises a valve assembly designed to allow a vacuum source to evacuate excess air from the interior volume and preventing air from returning into the interior volume. It is therefore submitted that the present invention is substantially divergent in design elements from the prior art, and consequently it is clear that there is a need in the art for an improvement to storage bags for firearms. In this regard, the instant invention substantially fulfills these needs.

SUMMARY OF THE INVENTION

[0015] In view of the foregoing disadvantages inherent in the known types of evacuable firearm enclosures now present in the prior art, the present invention provides a new and improved evacuable firearm enclosure wherein the same can be utilized for preventing corrosion to firearms.

[0016] It is therefore an object of the invention to provide a new and improved evacuable firearm enclosure that has all of the advantages of the prior art and none of the disadvantages.

[0017] An object of the present invention is to provide a new and improved evacuable firearm enclosure that improves the care and maintenance of firearms.

[0018] Another object of the present invention is to provide a new and improved evacuable firearm enclosure that can be operably sealed to prevent corrosion to firearms.

[0019] Still yet another object of the present invention is to provide a new and improved evacuable firearm enclosure that comprises a front portion and a back portion enclosed along its edges thereof with an open end providing access to an interior volume therebetween.

[0020] Yet another object of the present invention is to provide a new and improved evacuable firearm enclosure, wherein the open end includes a fastener designed to operably seal the open end and the interior volume.

[0021] A further object of the present invention is to provide a new and improved evacuable firearm enclosure, wherein the front portion includes a valve assembling having a valve base and a centrally located flange extending therefrom having an opening therethrough.

[0022] Still yet another object of the present invention is to provide a new and improved evacuable firearm enclosure, wherein the device may be readily fabricated from materials that permit relative economy and are commensurate with durability.

[0023] Other objects, features, and advantages of the present invention will become apparent from the following detailed description taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTIONS OF THE DRAWINGS

[0024] Although the characteristic features of this invention will be particularly pointed out in the claims, the invention itself and manner in which it may be made and used may be better understood after a review of the following description, taken in connection with the accompanying drawings wherein the numeral annotations are provided throughout.

[0025] FIG. **1** shows an overhead perspective view of a first embodiment of the present invention.

[0026] FIG. **2** shows an overhead perspective view of another embodiment of the present invention.

[0027] FIG. **3** shows an overhead perspective of the valve assembly of the present invention.

[0028] FIG. **4** shows an underside perspective of the valve assembly of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0029] References are made herein to the attached drawings. Like reference numerals are used throughout the drawings to depict like or similar elements of the firearm vacuum-sealed storage bag. For the purposes of presenting a brief and clear description of the present invention, the preferred embodiment will be discussed as used for enclosing firearms and care and maintenance for firearms. The figures are intended for representative purposes only and should not be considered to be limiting in any respect.

[0030] Referring now to FIGS. **1** and **2**, there are shown a pair of overhead perspectives of two preferred embodiments of the evacuable firearm enclosure **20**. The enclosure **20** includes a storage bag **21** having a front portion **22** and a coextensive back portion enclosed along its outer edge **23** thereof with an open end **24** providing access to an interior volume between the front portion **22** and the back portion. The open end **24** includes a fastener **25**, preferably a zip fastener, designed to operably seal the open end **24** and the interior volume. The front portion **22** includes a valve assembly **26** having a valve base having a centrally located flange extending outwardly therefrom. The centrally located flange comprises an opening therethrough that provides air passage from the interior volume of the storage bag **21** to the ambient environment. The centrally located flange is designed to be placed against a vacuum source configured to evacuate excess air from the interior volume through the opening.

[0031] The front portion **22** and the back portion are triangular in shape configured to receive a firearm in the interior volume therebetween. As demonstrated in both preferred embodiments, the barrel **51** of a handgun **50** or rifle **52** is inserted through the open end **24** and into the interior volume first, while the handle **53** of the handgun **50** or the rifle **52** is placed in last. The handgun **50** and the rifle **52** are then sealed therein using fastener **25**, preferably a zip fastener, designed to operably seal the storage bag **21**. As can be readily recognized, the evacuable enclosure **20** is particularly advantageous as it inhibits the growth of bacteria and prevents corrosion.

[0032] In some embodiments, the front portion **22** and the back portion further include a pair of handles **35** configured to allow a user to carry the storage bag **20** with a firearm therein. Preferably, the handles **35** are U-shaped, however, other suitable types of handles **35** are used in other embodiments. In addition, the front portion **22** and the back portion are preferably composed of a thermoset or a thermoplastic material, that is designed to be durable and impervious to air to ensure an air tight seal between the interior volume of the storage bag **21** and the ambient environment after the bag is evacuated. Furthermore, the storage bag **20** is impervious to moisture, which inhibits the growth of mildew.

[0033] The fastener **25** on open end **24** is preferably a zip fastener comprising a zipper that is equipped with a slider. The zipper is a pair of strips extending along the length of the open end **24**. The pair of strips have flanges and aligning male and female mating portions. The slider is configured to slide along the pair of strips and engage the aligning male and female mating portions to operatively seal the open end **24** and the interior volume. In other embodiments, the fastener **25** is alternatively composed of other suitable types of fasteners adapted to operatively seal the open end **24** providing access to the interior volume.

[0034] Referring now to FIGS. **3** and **4**, there are shown an overhead perspective and an underside perspective of the valve assembly **26** attached to the front portion **22**. The valve assembly **26** comprises a valve base **27** having a centrally located flange **28** extending outwardly therefrom. The centrally located flange **28** includes a first end **28**A and a second end **28**B forming a circular shaped opening **29** therethrough that provides an air passage to the interior volume of the storage bag. The second end **28**B of the opening **29** includes a spring-biased diaphragm **30** that is hingedly attached thereto and configured to bear against a rim **32** within the opening **29** on the second end **28**B.

[0035] The diaphragm **31** is substantially circular and configured to encircle the opening **29**, wherein the diaphragm **31** provides one-way airflow through the opening **29**. When a vacuum source is placed against the centrally located flange **28**, the suction applied by the vacuum source causes the diaphragm **31** to draw upward and allows excess air from within the interior volume to be evacuated. After air therein is evacuated, the diaphragm **31** returns to bear against the rim **32** within the opening **29**. Without the vacuum source, the opening **29** is closed by the diaphragm **31** due to the pressure differential between the interior volume and the ambient environment. In this way, the valve assembly **26** allows air to pass through the opening **29** in only one direction.

[0036] The first end **28**A of the centrally located flange **28** further includes a lid **32** hingedly attached thereto configured to provide an airtight seal for the valve assembly **26** by enclosing the centrally located flange **28** and pressing against the diaphragm **31** that bears against the rim within the opening **29**. The lid **32** is preferably removably fastened by a press fit, however, other suitable fasteners that encloses the centrally located flange **28** and provides an airtight seal for the valve assembly **26**.

[0037] Preferably, the valve base **27** is attached to the front portion of the storage bag through an air-tight bond formed through thermal bonding, however, other embodiments alternative attach the valve base **27** to the front portion of the storage bag through other suitable means. In some embodiments, the bottom surface of the valve base **27** further includes a plurality of rounded posts and vanes projecting radially inward from each rounded post. The rounded posts and vanes are configured to prevent items stored in the interior volume from blocking the opening **29** in the valve base **27**.

[0038] According to the preferred embodiment, the evacuable enclosure further provides a method of providing storage and prevent corrosion to a firearm, comprising the steps of:

receiving a firearm in an evacuable enclosure comprising a storage bag having a front portion and a back portion enclosed along its edges thereof with an open end providing access to an interior volume therebetween;

sealing said open end using a zip fastener configured to operably seal the open end and the interior volume of the storage bag;

placing a vacuum source against a centrally located flange having a first end and a second end forming an opening therethrough, wherein said centrally located flange extends outwardly from a valve base attached on said front portion and configured to provide air passage to the interior volume of storage bag;

extracting excess air from within the interior volume of the storage bag, wherein a spring-biased diaphragm hingedly attached within said opening at said second end is flexed upward from a rim of said opening at said second end, as suction from said vacuum source is applied to said opening;

returning said spring-biased diaphragm to said rim, wherein said spring-biased diaphragm blocks air passage through said opening of said centrally located flange as suction from said vacuum source is stopped;

fastening said first end of said centrally located flange using a lid hingedly attached to said first end, wherein said lid is configured to press down on said spring-biased diaphragm to bear against said rim to provide an airtight seal.

[0039] It is therefore submitted that the instant invention has been shown and described in what is considered to be the most practical and preferred embodiments. It is recognized, however, that departures may be made within the scope of the invention and that obvious modifications will occur to a person skilled in the art. With respect to the above descriptions then, it is to be realized that the optimum dimensional relationships for the parts of the invention, to include variations in size, materials, shape, form, function, and manner of operation, assembly and use, are deemed readily apparent and obvious to one skilled in the art, and all equivalent relationships to those illustrated in the drawings and described in the specifications are intended to be encompassed by the present invention.

[0040] Therefore, the foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

I claim:

1) A evacuable firearm enclosure configured to prevent corrosion to a firearm, comprising:

a storage bag having a front portion and a back portion connected together along its edges thereof with an open end providing access to an interior volume between said front portion and said back portion;

said open end comprising a fastener designed to operably seal said open end and said interior volume;

a valve assembly attached on said front portion of said storage bag;

said valve assembly comprises a valve base having a centrally located flange extending therefrom;

said centrally located flange having a first end and a second end forming an opening therethrough;

wherein a vacuum source is configured to be placed against said centrally located flange to evacuate excess air from said interior volume through said opening;

said front portion and said back portion are substantially triangular-shaped.

2) The evacuable firearm enclosure configured to prevent corrosion to a firearm of claim **1**, said fastener comprises a zip fastener.

3) The evacuable firearm enclosure configured to prevent corrosion to a firearm of claim **1**, wherein:

said opening on said first end of said centrally located flange comprises a rim and a spring-biased diaphragm that bears against the rim;

wherein said spring-biased diaphragm is configured to flex upward when the vacuum source applies suction to the opening.

4) The firearm vacuum-sealed storage bag of claim **2**, wherein said second end of said centrally located flange comprises a hingedly attached lid configured to open and close said centrally located flange.

5) The firearm vacuum-sealed storage bag of claim **4**, said valve base further comprises a plurality of vanes disposed on a bottom surface of said valve base in air communication with said defined interior volume;

wherein said plurality of vanes are fin-like projections designed to prevent air obstruction of said opening.

6) The firearm vacuum-sealed storage bag of claim **1**, wherein said front portion and said back portion further comprise a pair of handles configured to allow a user to carry said storage bag using their hands.

6) A method of providing storage and prevent corrosion to a firearm, comprising the steps of:

receiving a firearm in an evacuable enclosure comprising a storage bag having a front portion and a back portion enclosed along its edges thereof with an open end providing access to an interior volume therebetween;

sealing said open end using a zip fastener configured to operably seal the open end and the interior volume of the storage bag;

placing a vacuum source against a centrally located flange having a first end and a second end forming an opening therethrough, wherein said centrally located flange extends outwardly from a valve base attached on said front portion and configured to provide air passage to the interior volume of storage bag;

extracting excess air from within the interior volume of the storage bag, wherein a spring-biased diaphragm hingedly attached within said opening at said second end is flexed upward from a rim of said opening at said second end, as suction from said vacuum source is applied to said opening;

returning said spring-biased diaphragm to said rim, wherein said spring-biased diaphragm blocks air passage through said opening of said centrally located flange as suction from said vacuum source is stopped;

fastening said first end of said centrally located flange using a lid hingedly attached to said first end, wherein said lid is configured to press down on said spring-biased diaphragm to bear against said rim to provide an airtight seal.

* * * * *