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(54) **WINE STOP PUMP**

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(57) **ABSTRACT**

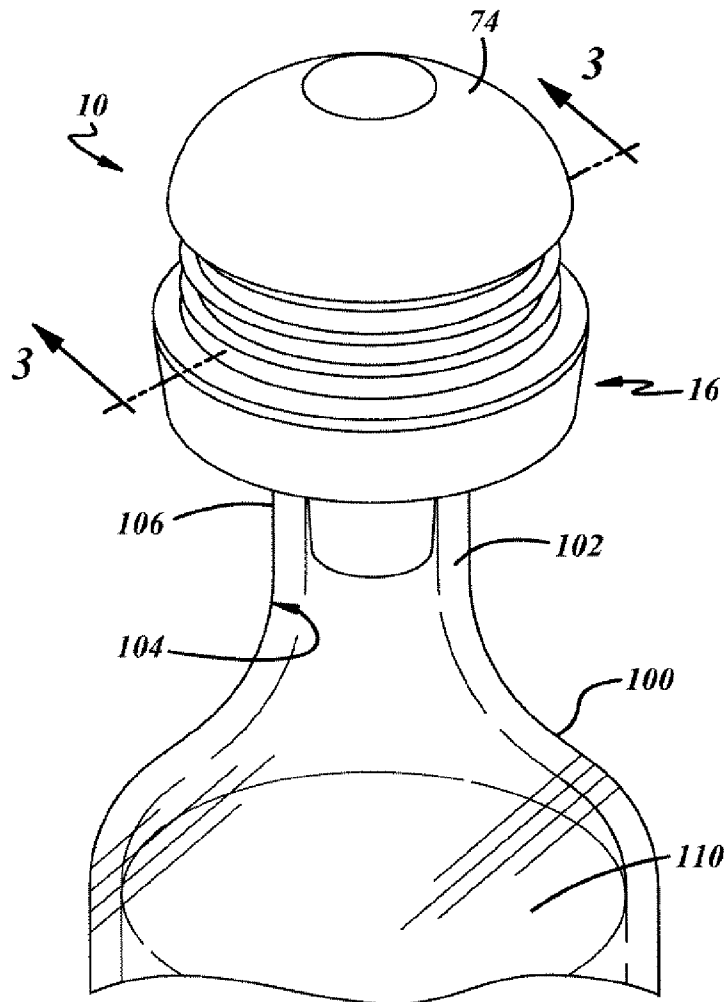
A cap device for capping an open wine bottle includes a base with a lower cylindrical portion that defines an interior space. The lower cylindrical portion engages the interior of the wine bottle. A pumping element engages an upper cylindrical portion of the base to define an interior portion in communication with the interior space. A first valve assembly is disposed in the lower cylindrical portion and is in communication with the interior space and the interior of the wine bottle. The first valve assembly is movable between an open and closed position for pulling air from the wine bottle. A second valve assembly is disposed in the upper cylindrical portion of the base and is in communication with the interior portion and the atmosphere. The second valve assembly is movable between an open and closed position for pushing air from the interior portion to the atmosphere.

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Related U.S. Application Data

(60) Provisional application No. 60/945,500, filed on Jun. 21, 2007.



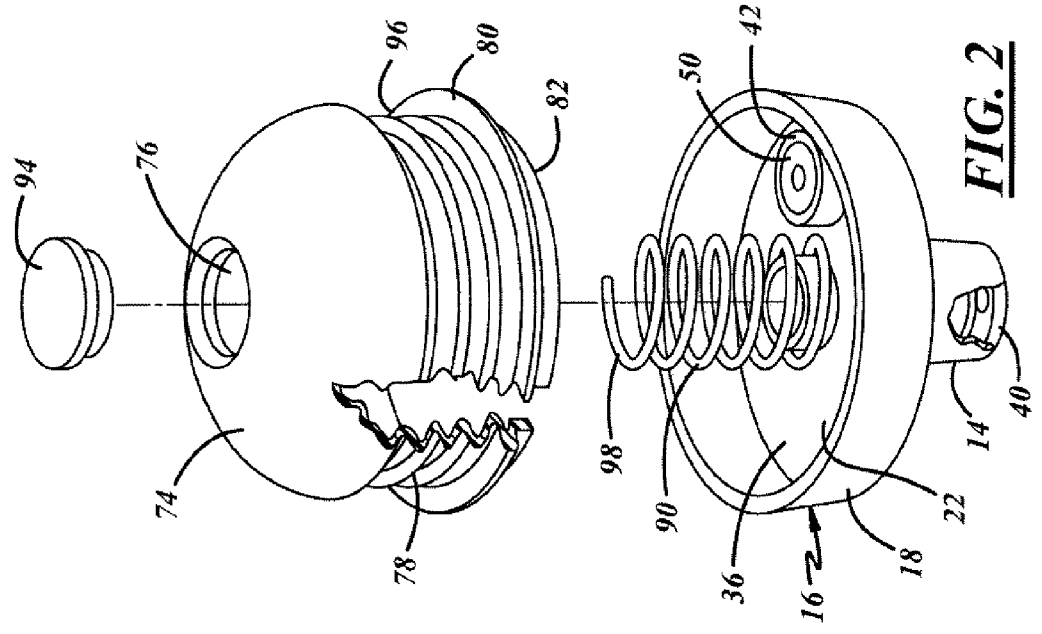


FIG. 2

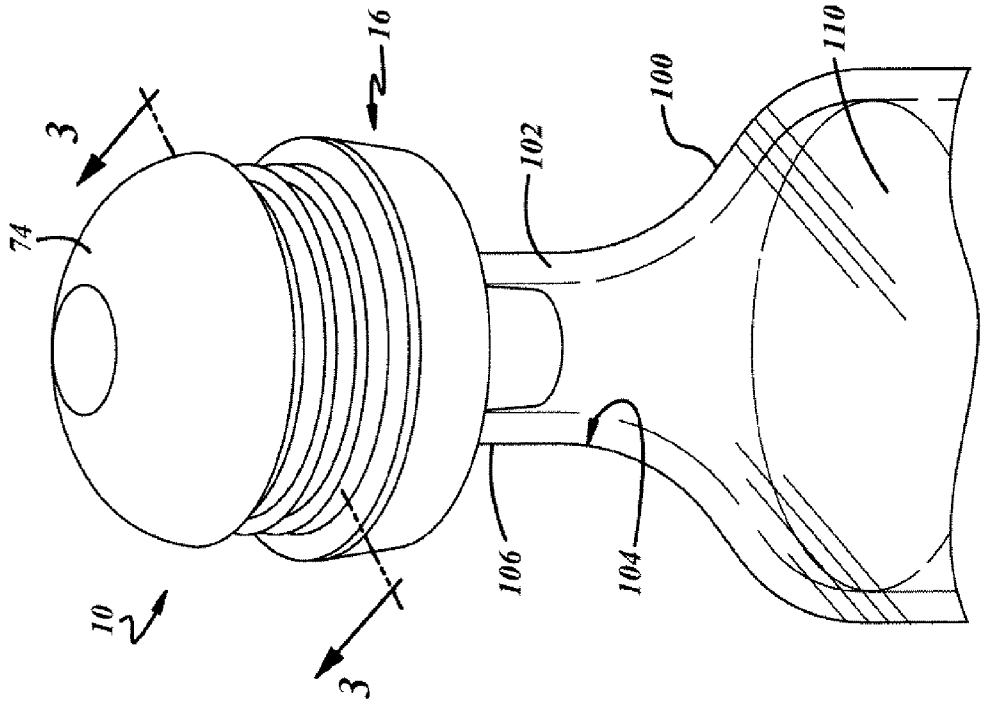


FIG. 1

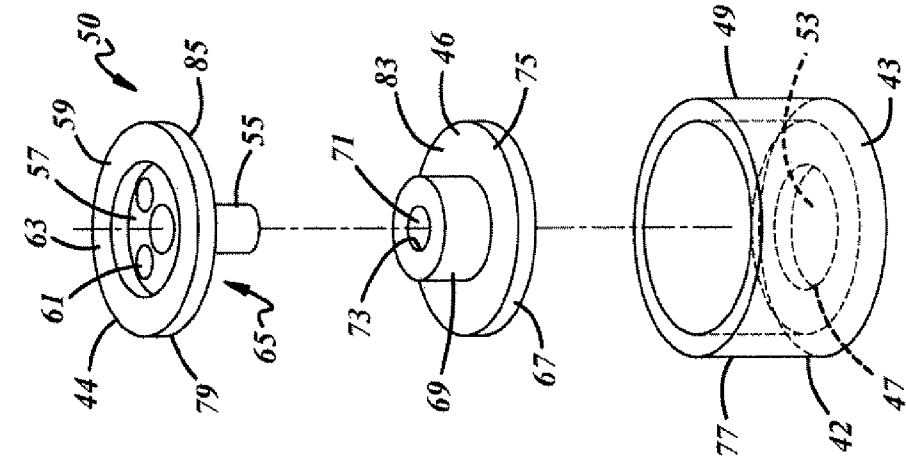


FIG. 4

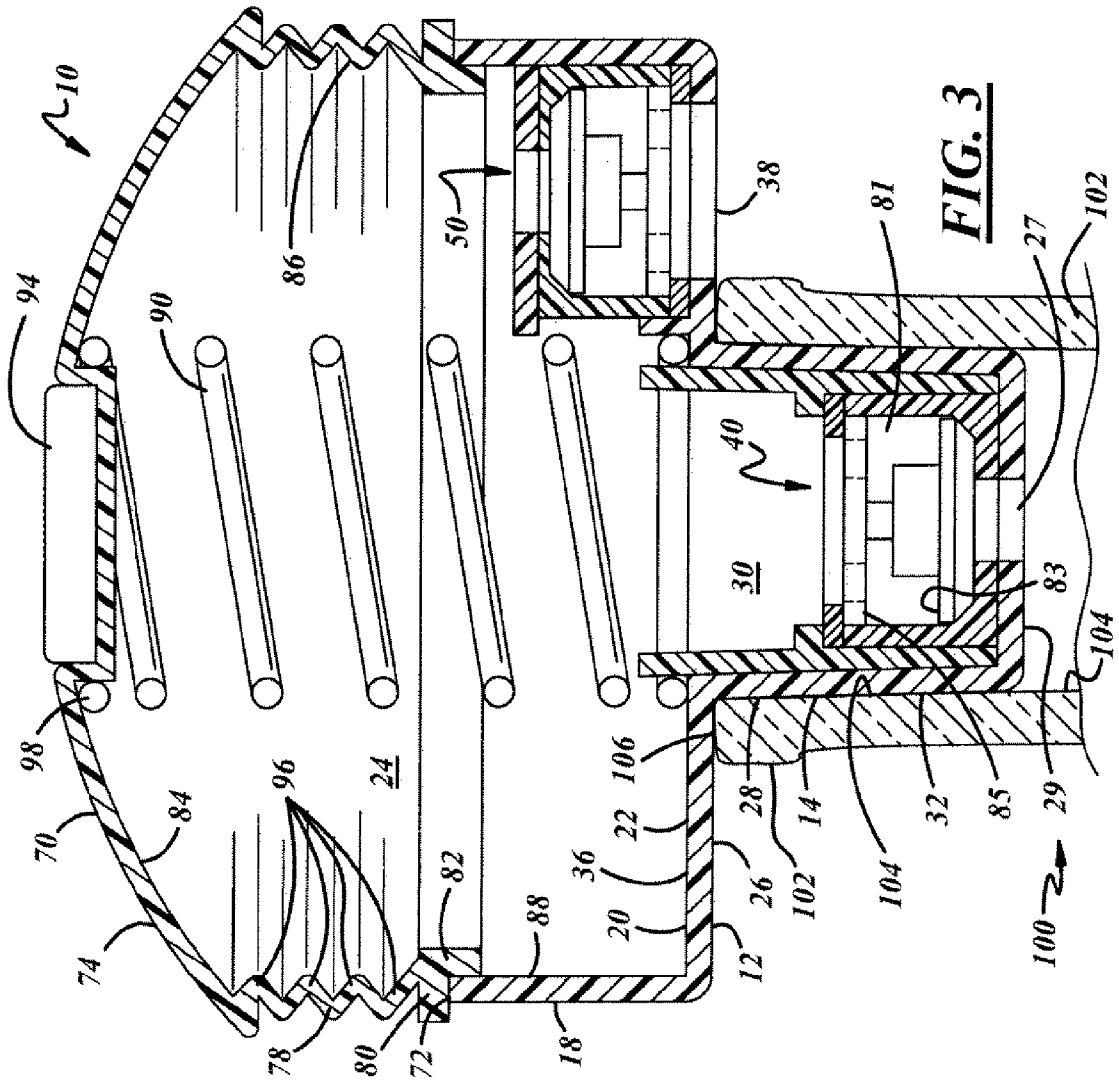


FIG. 3

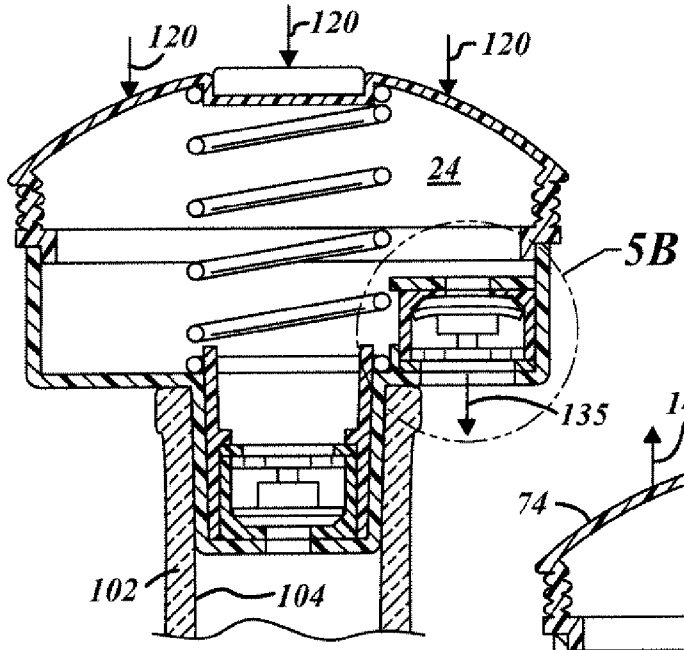


FIG. 5A

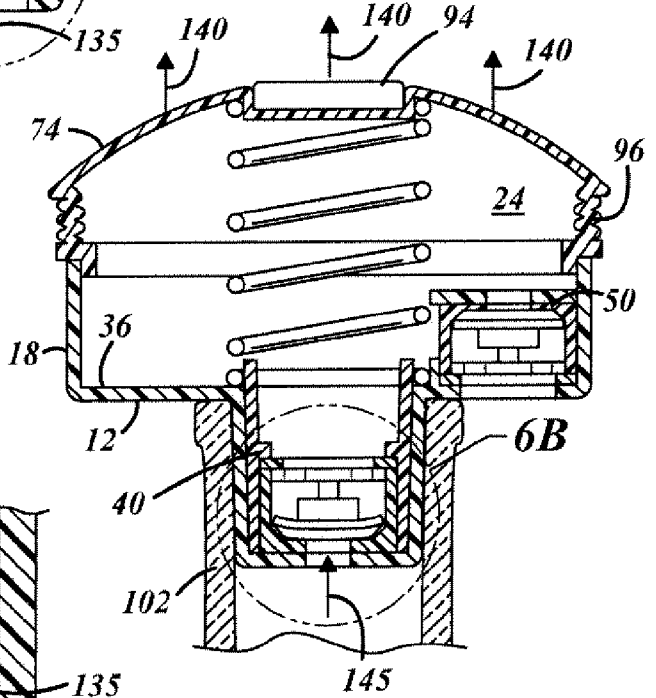


FIG. 6A

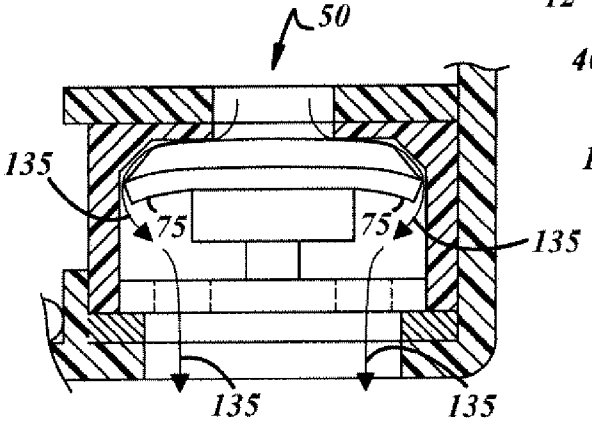


FIG. 5B

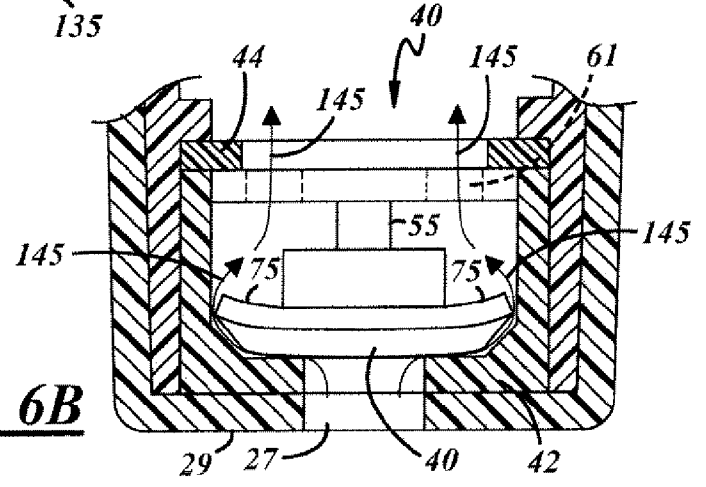


FIG. 6B

WINE STOP PUMP

CROSS REFERENCE TO RELATED APPLICATION

[0001] This application claims the benefit of U.S. Provisional Patent Application Ser. No. 60/945,500 for a WINE STOP PUMP, filed on Jun. 21, 2007, which is hereby incorporated by reference in its entirety.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention relates generally to a plug for capping an open wine bottle to preserve its contents for later use.

[0004] 2. Description of the Prior Art

[0005] It has long been a problem to preserve unused wine that remains in a bottle that has already been opened. It is well known that wine corks, which are placed onto wines when they are freshly bottled, create a virtual vacuum chamber, and that glass from which the bottle is constructed is impermeable to air for centuries and thus a good cork will keep air exchange to a minimum for an extended period. However, when the cork is removed, exposure of wine to air causes it to age rapidly, oxidizing and losing freshness. Thus, recapping wine bottles to prevent unnecessary aging has long been desired.

[0006] Accordingly, various solutions to the problem of recapping wine have been attempted. However, they all suffer from a variety of disadvantages.

[0007] For example, people have tried to preserve wine by placing the cork that was removed from the bottle back into the opening to seal it. However, it is often difficult to get the cork back into the bottle opening. Moreover, even if the cork is replaced, the seal created is typically less than complete, therein causing an increase in air exchange through the cork that accelerates the aging process. Further, it is also sometimes not possible to replace the cork onto the bottle of wine if the cork has been significantly damaged during removal thereof such that it is unusable.

[0008] Restaurants and other establishments that serve wine by the glass have created expensive capping systems that can be readily removed and replaced, and also remove any excess air from the bottle to assist in preserving the wine. While these systems are relatively effective, they are expensive and impractical for individual users.

[0009] It would thus be desirable to provide a wine capping device that provides a sealing cap to a wine bottle. It would also be desirable that the wine capping device has a mechanism for removing excess air from the interior of the wine bottle after recapping. It would also be desirable that such a device is easy to utilize. Further, it would be highly desirable that the wine capping device is relatively inexpensive such that it may be readily used and purchased by individuals, such as for home use.

SUMMARY OF THE INVENTION AND ADVANTAGES

[0010] It is therefore an advantage of the present invention to provide a replaceable wine cap for a previously opened wine bottle to preserve any wine that remains therein.

[0011] It is another advantage of the present invention to provide a replaceable wine cap that is capable of removing air from the interior of the wine bottle to create a vacuum cham-

ber that preserves the wine after being placed into communication with an opened wine bottle.

[0012] It is another advantage of the present invention to provide a replaceable wine cap that is inexpensive and easily usable and reusable by individuals, restaurants or other establishments.

[0013] In accordance with the above and the other advantages of the present invention, a wine stop pump is provided. The wine stop pump sealingly recaps a bottle of wine after it has been opened, therein substantially preventing air exchange with the interior of the bottle to prevent the oxidation and subsequent spoilage of the wine. The wine stop pump includes a pumping mechanism for removing air from the interior of the wine bottle after capping that aids in preventing oxidation of the wine associated with air exchange. The wine stop pump of the present invention is inexpensive and simple to use and reuse.

[0014] Other advantages and features of the present invention will become apparent when viewed in light of the detailed description and preferred embodiment when taken in conjunction with the attached drawings and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] Other advantages of the present invention will be readily appreciated, as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

[0016] FIG. 1 is a perspective view of a wine stop pump inserted into a bottle in accordance with one embodiment of the present invention;

[0017] FIG. 2 is an exploded view of a wine stop pump in accordance with one embodiment of the present invention;

[0018] FIG. 3 is a cross-section view of the wine stop pump of FIG. 1 taken along line 3-3 with the wine stop pump is in its normal position in accordance with one embodiment of the present invention;

[0019] FIG. 4 is an exploded view of a valve housing of the wine stop pump in accordance with one embodiment of the present invention;

[0020] FIG. 5A is a cross-section view of the wine stop pump of FIG. 1 taken along line 3-3 illustrating its position when a force has been applied to the wine stop pump in accordance with one embodiment of the present invention;

[0021] FIG. 5B is an enlarged view of the valve portion of the wine stop pump of FIG. 5A in an open position in accordance with one embodiment of the present invention;

[0022] FIG. 6A is a cross-section view of the wine stop pump of FIG. 1 taken along line 3-3 illustrating its position when the wine stop pump is returning to its unpumped position in accordance with one embodiment of the present invention; and

[0023] FIG. 6B is an enlarged view of the valve portion of FIG. 6A in an open position in accordance with one embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0024] In the following figures, the same reference numerals are used to identify the same components in the various views. The terms "lower" and "upper" as described herein are terms used to describe the relative environment of components relative to one another as illustrated in the following FIGS. 1-4, 5A, 5B, 6A and 6B. As such, in practice, a piece

described as an upper piece is not limited to an arrangement wherein that piece must be upward relative to another piece in use and is thus not a limiting feature of the claims of the present invention.

[0025] Referring now to the Figures, which illustrate a wine stop pump 10 in accordance with one preferred embodiment of the present invention. The wine stop pump 10 is utilized to recap and seal wine bottles 100 that have previously been opened and had their corks (not shown) removed.

[0026] The wine stop pump 10 includes a base 12 having a lower cylindrical portion 14 and an upper cylindrical portion 16. The upper cylindrical portion 16 includes a cylindrical wall 18 projecting outwardly (shown as upward in FIGS. 3, 5A, 5B, 6A and 6B) from a first side 20 of a flat disk portion 22. The cylindrical wall 18 is disposed on the outer periphery of the flat disk portion 22. The lower cylindrical portion 14 has a cylindrical wall 28 that projects from a second side 26 of the flat disk portion 22 (shown as downward in FIGS. 3, 5A, 5B, 6A and 6B). The lower cylindrical portion 14 also includes a bottom disk portion 29 having a center opening 27. The cylindrical wall 28 and the bottom disk portion 29 define an interior space 30 therewithin. The outer surface 32 of the cylindrical wall 28 is sized slightly smaller than the interior surface 104 of the neck 102 of a wine bottle 100 such that cylindrical wall 28 may be readily inserted within the interior surface 104 of the neck 102 of the wine bottle 100 to sealingly recap the wine bottle 100.

[0027] The flat disk portion 22 has sufficient diameter such that the second side 26 of the inner cylindrical portion 34 completely covers the spout 106 and such that an outer portion 36 of the flat disk portion 22 extends a distance outwardly (shown as to the left and to the right of the spout 106 in FIG. 1) beyond the spout 106 of the wine bottle 100 when the wine stop pump 10 is sealed to recap the wine bottle 100. The outer portion 36 includes an opening 38.

[0028] The base 12 is preferably constructed of a durable, moisture resistant non-corrosive material that is inexpensive to manufacture and form to its desired configuration. In a preferred embodiment, the base 12 is formed of a thermoplastic or thermosetting polymeric material such as polypropylene. The base 12 is preferably formed by a conventional molding operation such as injection molding.

[0029] Sealingly coupled within the interior space 30 of the lower cylindrical portion 14 is a first valve assembly 40. Further, sealingly coupled within the opening 38 of the outer portion 36 is a second valve assembly 50 that, preferably, is of the same design as the first valve assembly 40. The first valve assembly 40 is positioned to allow air to move from the interior 110 of the wine bottle 100 through the first valve assembly 40 and into the interior space 30, but not allowing air to move from the interior space 30 to the interior 110 of the wine bottle 100. Meanwhile, the second valve assembly 50 is positioned to allow air to move from the interior space 30 through the valve assembly 50 and be exchanged with air outside the bottle 100, but not allow air to move from the exterior back through the second valve assembly 50 to the interior space 30. Thus, the first valve assembly 40 and the second valve assembly 50 allow air to be removed from the interior of the wine bottle 100 through the wine stop pump 10 and to the exterior of the wine bottle 100 when the wine stop pump 10 is sealingly coupled thereto. The mechanism for removing air from the wine bottle 100 through the wine stop pump 10 will be discussed further below with respect to FIGS. 5 and 6 below.

[0030] Referring now to FIG. 3, a valve assembly 50 is illustrated in accordance with a preferred embodiment of the present invention. As discussed above, the second valve assembly 50 and the first valve assembly 40 preferably have the same configuration and thus only one assembly need be described in detail herein. The first valve assembly 40 and second valve assembly 50 each include a first housing 42, a second housing 44, and a silicone valve 46. The first housing 42 and the second housing 44 are sealingly coupled together along their outer peripheries 77, 79 such that the silicone valve 46 is contained or encapsulated within the first housing 42 and the second housing 44. The silicone valve 46 is retained in position within the first and second housing 42, 44 and is moveable between an open and closed position. One preferred method for sealingly coupling the first housing 42 to the second housing 44, is by sonic welding. However, other mechanisms may alternatively be utilized.

[0031] The first housing 42 includes a cylindrical base portion 43 having a central opening 53. A cylindrical wall portion 49 projects perpendicularly from one side 47 of the cylindrical base portion 43 along its outer periphery 51. The second housing 44 includes a pin portion 55 extending from a center portion 57 of a disk portion 59. The disk portion 59 also includes one or more of venting holes 61 located outwardly of the center portion 57 that extend from an exterior side 63 to an interior side 65.

[0032] The silicone valve 46 includes a seating portion 67 and a tubular projection 69. An opening 71 preferably corresponding slightly larger in size and shape than the pin portion 55 is located within an interior portion 73 of the tubular projection 69 farthest away from the seating portion 67. An outer portion 75 of the seating portion 67 is thin enough such that it can flex towards the tubular projection 69 under sufficient vacuum pressure.

[0033] In the assembled state, as best shown in FIG. 3, the pin portion 55 is inserted within the tubular projection 69 and the seating portion 67 is seated onto the cylindrical base portion 43 covering the opening 53 and blocking air flow therethrough. The outer peripheries 77, 79 of the first housing 42 and the second housing 44 are sealed together, preferably by sonic welding. This creates an inner space 81 defined between the top surface 83 of the outer portion 75 and the inner surface 85 of the second housing 44. The outer portion 75 of the silicone valve 46 is thin enough such that it is capable of flexing towards the top surface 83 under sufficient vacuum pressure, therein uncovering the opening 53 from beneath the seating portion 67.

[0034] Similar to the base portion 12, the first housing 42 and the second housing 44 of the respective valve assemblies 40, 50 are preferably formed of a thermoplastic or thermosetting polymeric material, such as polypropylene and molded by a conventional molding operations, such as injection molding.

[0035] Referring now to FIGS. 1-3, a pumping element 70 is seated onto an upper cylindrical surface 72 of cylindrical wall 18 of the upper cylindrical portion 16. The pumping element 70 includes a dome-shaped top portion 74 including a center opening 76 and a wall portion 78 having a flanged seat portion 80 and an inwardly projecting flange 82. The wall portion 78 also includes a plurality of bellows 96 between the flanged seat portion 80 and the dome shaped portion 74. The interior surface 84 of the dome-shaped portion 74, the interior surface 86 of the wall portion 78, the inner surface 88 of the

cylindrical wall **18** and the one side **20** of the flat disk portion **22** together define an interior portion **24** there within.

[0036] The flanged seat portion **80** is sealingly coupled to the upper cylindrical surface **72** of the cylindrical wall **18** such that the inwardly projecting flange **82** is contained within the interior portion **24**. This coupling is preferably accomplished by sonic welding the flanged seat portion **80** to the upper cylindrical surface **62**.

[0037] A metal spring **90** is coupled onto the first side **20** of the inner cylindrical portion within the interior portion **24**. A cap plug **94** is coupled within the center opening **76** of the dome shaped top portion **74** and onto a top portion **98** of the metal spring **90**, therein biasing the spring **90** in a loaded position pushing against the dome shaped top portion **74** and cap plug **94**.

[0038] The second valve assembly **50** is sealingly coupled within the second housing **44** and is located further inward towards the interior space **24**, while the first housing **42** is flushed against and preferably sealingly coupled to the outer portion **36** at the opening **38**.

[0039] Referring now to FIGS. **5A**, **5B**, **6A** and **6B**, the mechanism for coupling the wine stop pump **10** to the wine bottle **100** and removing air from the interior **110** of the wine bottle **100** after the wine stop pump **10** has been installed is illustrated and discussed in more detail.

[0040] First, the lower cylindrical portion **14** of the wine stop pump **10** is positioned within the interior region **110** of the neck **102** of the wine bottle **100** such that the second side **26** sealingly covers the spout **106**.

[0041] Next, as shown in FIG. **5A**, a user depresses the dome-shaped top portion **74** of the pumping element **70** against the spring **90** as illustrated by arrows **120**, causing the plurality of bellows **96** to compress. This causes a decrease in the size of the interior portion **24**, therein increasing the air pressure contained within the interior portion **24**. As best shown in FIG. **5B**, the increased air pressure causes the outer portion **75** of the silicone valve **46** of the second valve assembly **50** to flex towards the top surface **83**, therein uncovering the opening **53** from beneath the seating portion **67**. Air (shown by arrows **135**) is then allowed to enter the inner space **81** and is vented through the vent openings **61** until such time as the pressure within the interior pressure **24** is relieved to the extent the outer portion **75** moves back to the seated position to reseal and cover the opening **53**.

[0042] Next, as shown in FIG. **6A**, the user removes the pressure applied to the dome shaped portion **74**. The biased spring **90** action causes the dome-shaped portion **74** to move upward back towards its unpumped position, as shown in FIG. **3**, by arrows **140**. This increases the space within the interior portion **24**, causing a decrease in air pressure within the interior portion **24** relative to the interior **110** of the wine bottle **100** and creating a vacuum effect. This vacuum effect, as shown in FIG. **6B** causes the outer portion **75** of the silicone valve **46** of the first valve assembly **40** to flex towards the top surface **83**, therein uncovering the opening **27** from beneath the seating portion **67**. Air (shown by arrows **145**) is then allowed to enter the inner space **81** from the interior **110** of the wine bottle **100** until such time as the pressure within the interior pressure **24** is increased sufficiently relative to the air pressure in the interior **110** such that the outer portion **75** moves back to its seated position and is resealed to cover the opening **53**.

[0043] The net result of the action as described in FIGS. **5A**, **5B**, **6A** and **6B** is the removal of air from the interior **110** of

the wine bottle **100** through the first valve assembly **40**, with the excess air vented through the wine stop pump **10** through the second valve assembly **50** and to the atmosphere. The process of depressing and unpressing the dome shaped portion **74** may be performed several more times to ensure relatively complete removal of air within the interior **110** of the bottle **100**. As one of ordinary skill recognizes, exposure of wine to air causes it to age rapidly, oxidizing and losing freshness. Thus, the removal of air from a capped bottle **100** acts to prevent oxidation, therein increasing the period of freshness of the wine.

[0044] To remove the wine stop pump **10**, a user simply pull upward of the entirety of the wine stop pump **10**, therein breaking the seal between the spout **106** and the second side **26**. The user may then pour the wine from the wine bottle and recap the wine bottle as described above.

[0045] The present invention thus provides a simple method for maintaining the freshness of a previously opened bottle of wine. The present invention provides a wine stop pump **10** that is easy to use and clean.

[0046] While particular embodiments of the invention have been shown and described, numerous variations and alternate embodiments will occur to those skilled in the art.

What is claimed is:

1. A cap device for capping an open wine bottle to preserve its contents for later use comprising:

a base having a flat disk portion and a lower cylindrical portion extending axially from said flat disk portion to engage the interior of the neck of the open wine bottle, said lower cylindrical portion defining an interior space therewithin;

said base including an upper cylindrical portion having a cylindrical wall extending axially from the periphery of said flat disk portion in a direction opposite of said lower cylindrical portion and to an upper cylindrical surface;

a pumping element for mating with said upper cylindrical surface of said upper cylindrical portion to define an interior portion in communication with said interior space;

a first valve assembly disposed in said lower cylindrical portion of said base and in communication with said interior space and the interior of the wine bottle, said first valve assembly being movable between an open and closed position for pulling air from the interior of the wine bottle while allowing no air to seep back into the wine bottle from said interior space; and

a second valve assembly disposed in said upper cylindrical portion of said base and in communication with said interior portion and the atmosphere, said second valve assembly being movable between an open and closed position for pushing air from said interior portion to the atmosphere while allowing no air to seep back into said interior portion from the atmosphere.

2. The cap device as set forth in claim **1** further including a spring disposed between said pumping element and said flat disk portion for biasing said pumping element axially away from said flat disk portion of said base.

3. The cap device as set forth in claim **1** wherein said pumping element includes a top portion and an axially extending wall portion to engage said upper cylindrical surface of said upper cylindrical portion, said wall portion having a plurality of bellows for allowing said pumping element to move axially upward and downward.

4. The cap device as set forth in claim 1 wherein each of said valve assemblies include a first housing, a second housing secured to said first housing to define an inner space and a silicon valve disposed in said inner space, said first housing defining an opening and said silicon valve having a seating portion that extends radially outward to an outer portion for being pressed against said opening for placing said valve assembly in said closed position.

5. The cap device as set forth in claim 4 wherein said outer portion of said silicone valve is flexible to flex toward the second housing portion for placing said valve assembly in said open position.

6. The cap device as set forth in claim 1 wherein both said first and second valve assemblies are in said closed position.

7. The cap device as set forth in claim 6 wherein said first valve assembly is in said closed position and said second valve assembly is in said open position and air is pushed from said interior portion to the atmosphere as a top portion of said pumping element is engaged and pressed toward said base.

8. The cap device as set forth in claim 6 wherein said second valve assembly is in the closed position and said first valve assembly is in an open position and air is pulled from the interior of the wine bottle to said interior space of said base as a top portion of said pumping element is biased away from said base.

9. The cap device as set forth in claim 8 further including a spring disposed between said pumping element and said flat disk portion for biasing said pumping element axially away from said flat disk portion of said base.

10. A cap device for capping an open wine bottle to preserve its contents for later use comprising:

a base having a flat disk portion and a lower cylindrical portion extending axially from said flat disk portion to engage the interior of the neck of the open wine bottle, said lower cylindrical portion defining an interior space therewithin;

said base including an upper cylindrical portion having a cylindrical wall extending axially from the periphery of said flat disk portion in a direction opposite of said lower cylindrical portion and to an upper cylindrical surface;

a pumping element having a top portion and an axially extending wall portion to engage said upper cylindrical surface of said upper cylindrical portion to define an interior portion in communication with said interior space, said wall portion including a plurality of bellows for allowing said pumping element to move axially upward and downward;

a spring disposed between said pumping element and said flat disk portion for biasing said pumping element axially away from said flat disk portion of said base;

a first valve assembly disposed in said lower cylindrical portion of said base and in communication with said interior space and the interior of the wine bottle, said first valve assembly being movable between an open and closed position for pulling air from the interior of the wine bottle while allowing no air to seep back into the wine bottle from said interior space; and

a second valve assembly disposed in said upper cylindrical portion of said base and in communication with said interior portion and the atmosphere, said second valve assembly being movable between an open and closed position for pushing air from said interior portion to the atmosphere while allowing no air to seep back into said interior portion from the atmosphere.

11. The cap device as set forth in claim 10 wherein each of said valve assemblies include a first housing, a second housing secured to said first housing to define an inner space and a silicon valve disposed in said inner space, said first housing defining an opening and said silicon valve having a seating portion that extends radially outward to an outer portion for being pressed against said opening for placing said valve assembly in said closed position.

12. The cap device as set forth in claim 11 wherein said outer portion of said silicone valve is flexible to flex toward the second housing portion for placing said valve assembly in said open position.

13. The cap device as set forth in claim 10 wherein both said first and second valve assemblies are in said closed position.

14. The cap device as set forth in claim 13 wherein said first valve assembly is in said closed position and said second valve assembly is in said open position and air is pushed from said interior portion to the atmosphere as a top portion of said pumping element is engaged and pressed toward said base.

15. The cap device as set forth in claim 13 wherein said second valve assembly is in the closed position and said first valve assembly is in an open position and air is pulled from the interior of the wine bottle to said interior space of said base as a top portion of said pumping element is biased away from said base.

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