The present invention discloses a series of stable wine glasses comprising stemless wine glasses with internal container shapes appropriate to their respective types of wines and having improved stability. Appropriate internal container shapes provide the desired presentation of the bouquet of the wine. The stable wine glass provides a more stable foot which may be wider than the container of the wine glass. The stable wine glass may be insulated from the human hand by a thicker portion of container wall or by a second wall, exterior to the wine container, which may be of glass or other material and may form an air pocket between the container wall and the second wall. The second outer wall may be perforated or may be whole. Alternatively, the outer surface may be covered with an insulating material.
STABLE WINE GLASSES

BACKGROUND OF THE INVENTION

[0001] 1. Technical Field

[0002] The present invention relates generally to the field of wine glasses and, more specifically, to methods for improving the stability of a wine glass.

[0003] 2. Background

[0004] Making wine glasses is an ancient art. While wine glasses are generally regarded as attractive to the eye, there are also functional considerations in the making of a wine glass. Wine glasses are made to present the bouquet of a particular wine in a particular way. Thus, a glass for a white wine will have a narrow, or fluted, shape to concentrate the thin bouquet of a white wine. Similarly, a glass for a red wine has a wider shape to let the stronger bouquet disperse. Different red or white wines may have different bouquets, so makers of wine glasses practice variations on the major themes. In response to the demands of wine enthusiasts, wine glasses are made in shapes unique to virtually every major subclass of white and red wine. The wine glasses made by Reidel, The Wine Glass Company, of Austria are excellent examples of wine glasses functionally shaped for a particular type of wine.

[0005] A wine glass has three major parts: the container, the stem, and the foot. Each part has unique functions. The container is controlled by the shape and proportion of the container part of the wine glass, which typically bends radially inward. The point where the inward bending begins or where the sides straighten may be called the inflection point. A few flute designs appear to have no inflection point. The size and shape of the container portion are unique to the type of wine for which the glass is intended. A wine glass, properly filled, is filled with wine only to the point where the inward bending begins. Flutes without inflection points are typically filled to the top of the bottom bowl-shaped portion. Filling the glass only to the inflection point maximizes the effect of the bouquet-presenting features of the glass. Reduction of the surface area of the wine to the area of the opening at the top of the container and to the volume of air between the opening and the wine are defining parameters for a wine glass.

[0006] Not all glasses that have inward-bending upper portions are wine glasses, as a connoisseur understands that term. For example, one can find whiskey glasses and brandy snifters on the market that have inward-bending upper portions, but these are unfit for presenting wines for several reasons. One of those reasons is that the ratios are wrong for wine. For example, a brandy snifter has an extremely large brandy surface area to container opening area ratio and a very large air volume to opening area ratio. This is not appropriate for a wine. The light bouquet of a white wine would be lost in such a large air volume. The heavy (“full bodied”) bouquet of a red wine would be too concentrated by the small opening.

[0007] Wine connoisseurs prefer their wines served at a temperature appropriate to the wine. For example, white wines are generally served chilled and red wines are usually served at room temperature. Some connoisseurs are extremely exacting about the proper temperature for the wine. The fictional James Bond, for example, expressed author Ian Fleming’s preferences when he would not drink Bollinger Champagne at a temperature above 38 degrees Fahrenheit. (“there are some things that just aren’t done”). To maintain the wine at the proper temperature in the glass long enough for a person to pleasurably consume the wine, wine glasses are conventionally made with stems. The wine glass is held by the stem to prevent the warmth of the human hand from changing the temperature of the wine in the glass. The stem is usually a thin glass rod. Stems are so pervasive in wine glass making that wine glasses are often referred to as “stem ware.” Stemmed glasses are also used for brandy and a few other beverages. (In contrast to a wine glass, which is held by the stem, a brandy snifter is held by the container, for the purpose of warming the brandy by hand.)

[0008] The stem descends from the bottom of the container of the wine glass to the top of a foot. The foot is usually a disc of glass, slightly concave underneath, to provide contact to a level table surface only at the outer edge of the underside of the foot. The foot is typically no larger in diameter than the container, as an accommodation to shipping and storage considerations. The purpose of the foot is to maintain the wine glass in an upright orientation when it is resting on a surface. The foot may also be used to engage wine glass racks that store wine glasses by hanging them upside down by the foot. The traditional wine glass foot is a pedestal type foot, comprising an upwardly sloping portion rising to meet the stem above the disc.

[0009] Another functional aspect of a wine glass is transparency. Wines are judged, in part, by their color and clarity. Consequently, most current wine glasses are transparent. Some wine glasses are colored or opaque. For example, wine glasses carved from onyx stone are available, as are wine glasses made from or plated with noble metals such as platinum or gold. Some wine glasses have colored decorations or are made of colored glass.

[0010] Yet another requirement for wine glasses is that the glass not change the flavor of the wine. This generally translates into a requirement that the material which actually contacts the wine be chemically inert. Glass, including crystal, certain other ceramics, gold, platinum, and some stones and fused gemstones qualify as chemically inert at wine-drinking temperatures. These materials may comprise the container, the whole wine glass, or just the interior surface of the container and the lip-engaging portion of the exterior surface of the container.

[0011] Another function of a wine glass is to enable swirling the wine. The purpose of swirling is to mix the aroma of the wine with the air in the container to form a bouquet. Swirling is not churning. The motion of the wine must move the upper surface of the wine against the lower surface of the air in the container. Churning occurs when air bubbles are pulled into the wine by turbulence in the wine brought on by overly energetic swirling or poor design of the wine glass. Churning unbalances the bouquet. Wine glasses have smooth, rounded, radially symmetrical interior surfaces to enable swirling without churning. The exterior surfaces may be of any shape.

[0012] Current wine glasses are not very stable. The stem creates a high center of gravity when the wine glass is full. Consequently, a comparatively small tipping force can spill the wine. The problem is exacerbated when the surface upon which the wine glass is resting is uneven. For example,
wooden picnic tables, lawns, beaches, forest floors, and other places for romantic picnics pose stability and spilling challenges for the wine drinker. Likewise, the problem is exacerbated when the surface upon which the wine glass rests is moving. For example, on a yacht at sea, a small boat at anchor being rocked by waves, and an airliner in flight all pose stability and spilling challenges for wine glass users. The need for a stable wine glass has been long felt.

[0013] Modern tumblers have slightly better stability than wine glasses. Tumblers were originally designed to have rounded bottoms so that they would fall over (tumble) if the drinker released his grip. Modern tumblers have feet, but do not have container shapes adapted to presenting the bouquet of a wine. Likewise, tumblers are held by the container, which tends to warm the wine. Often, tumblers are opaque or are of colored glass, which obscures the color of the wine. Tumblers have flat interior container bottoms, which interferes with swirling. Consequently, the advantages of wine glasses are not provided by substituting a tumbler for a wine glass. The problems with tumblers are no obstacle to barbarians, of course, but for wine connoisseurs, a tumbler degrades the enjoyment of the wine.

[0014] The problem, then, is that wine glasses which are used in casual circumstances such as on a boat or at a picnic present tipping and spilling problems. Stem ware also presents difficulties for those who are maladroit by virtue of age, medical condition, or intoxication. Current alternatives to stem ware, such as tumblers, fail to properly present the wine.

SUMMARY OF THE INVENTION

[0015] Accordingly, the present invention involves a series of stable wine glasses comprising stemless wine glasses with internal container shapes appropriate to their respective types of wines and having improved stability. Appropriate internal container shapes provide the desired presentation of the bouquet of the wine. The stable wine glass provides a more stable foot which may be wider than the container of the wine glass. The stable wine glass may be insulated from the human hand by a thicker portion of container wall or by a second wall, exterior to the wine container, which may be of glass or other material and may form an air pocket between the container wall and the second wall. The second outer wall may be perforated or may be whole. Alternatively, the outer surface may be covered with an insulating material.

BRIEF DESCRIPTION OF DRAWINGS

[0016] Exemplary embodiments of the present invention will hereinafter be described in conjunction with the appended drawings, where like designations denote like elements, and

[0017] FIG. 1A shows a vertical cross-sectional view of an exemplary embodiment of a stable wine glass for a red wine glass;

[0018] FIG. 1B shows a vertical cross-sectional view of another exemplary embodiment of a stable wine glass for a red wine glass;

[0019] FIG. 1C shows a vertical cross-sectional view of an exemplary embodiment of a stable wine glass for a champagne flute;

[0020] FIG. 1D shows a vertical cross-sectional view of an exemplary embodiment of a stable wine glass for a bordeaux balloon style wine glass;

[0021] FIGS. 2A-E show vertical cross-sectional views of alternate exemplary embodiments of a stable wine glass using a bordeaux balloon style wine glass as a basis for illustrating the differences in the embodiments;

[0022] FIG. 2A shows a vertical cross-sectional view of an example of an embodiment of a stable wine glass comprising a container with a foot and a filet;

[0023] FIG. 2B shows a vertical cross-sectional view of an example of an embodiment of a stable wine glass comprising a container with a foot and a filet and a second outer wall attached to the foot;

[0024] FIG. 2C shows a vertical cross-sectional view of an example of an embodiment of a stable wine glass comprising a container with a foot and a filet and a second outer wall attached to the foot and to the container;

[0025] FIG. 2D shows a vertical cross-sectional view of an example of an embodiment of a stable wine glass comprising a container with a filet and a second outer wall attached to the container;

[0026] FIG. 2E shows an alternate example of an embodiment of a stable wine glass comprising a container with a foot and a filet and a second outer wall attached to the foot;

[0027] FIG. 3 shows a vertical cross-sectional view of an additional exemplary embodiment of the stable wine glass adapted for a wine tasting glass;

[0028] FIGS. 4A-D show vertical cross-sectional views of additional exemplary embodiments of the stable wine glass adapted for a sparkling wine flute;

[0029] FIG. 4A shows a vertical cross-sectional view of an example of an embodiment of a stable wine glass comprising a container with a wide foot and a filet;

[0030] FIG. 4B shows a vertical cross-sectional view of an example of an embodiment of a stable wine glass comprising a container with a wide foot and a filet and a second outer wall attached to the foot;

[0031] FIG. 4C shows a vertical cross-sectional view of an example of an embodiment of a stable wine glass comprising a container with a wide foot and a filet and a second outer wall attached to the container and to the foot;

[0032] FIG. 4D shows a vertical cross-sectional view of an example of an embodiment of a stable wine glass comprising a container with a foot and a filet and a second outer wall attached to the container, wherein the foot is wider than the container but not as wide as the second outer wall;

[0033] FIGS. 5A-D show vertical cross-sectional views of additional exemplary embodiments of the stable wine glass adapted for a white wine glass;

[0034] FIG. 5A shows a vertical cross-sectional view of an example of an embodiment of a stable wine glass comprising a container with a wide foot and a filet and also showing an alternative foot configuration;

[0035] FIG. 5B shows a vertical cross-sectional view of an example of an embodiment of a stable wine glass
comprising a container with a foot and a filet and a second outer wall attached to the foot;

[0036] FIG. 5C shows a vertical cross-sectional view of an example of an embodiment of a stable wine glass comprising a container with a foot and a filet and an alternative second outer wall configuration attached to the foot, the foot shown in an alternative foot configuration.

[0037] FIG. 5D shows a vertical cross-sectional view of an example of an embodiment of a stable wine glass comprising a container with a wide foot and a filet and a second outer wall attached to the foot and integral with the container.

[0038] FIG. 6 shows a vertical cross-sectional view of an example of an embodiment of a stable wine glass comprising a container with a traditional wine glass foot and a second outer wall attached to the foot;

[0039] FIG. 7 shows a vertical cross-sectional view of an example of an embodiment of a stable wine glass comprising a container with a wide foot and a filet and a second outer wall attached to the container;

[0040] FIG. 8A shows a vertical cross-sectional view of an example of an alternative embodiment of a stable wine glass comprising a container with a wide foot and a second outer wall attached to the foot and touching the container;

[0041] FIG. 8B shows a plan view of the exemplary embodiment of FIG. 8A;

[0042] FIG. 9 shows a vertical cross-sectional view of an alternative example of an alternative embodiment of a stable wine glass comprising a container with a wide foot and a second outer wall attached to the foot and touching the container;

[0043] FIG. 10A shows the stable wine glass of FIG. 2B tilted, and shows that the center of mass is still above the foot in the tilted position; and

[0044] FIG. 10B shows a prior art wine glass tilted, and shows that the center of mass is not above the foot in the tilted position.

DISCLOSURE OF THE INVENTION

[0045] Accordingly, as shown in FIG. 1A, an exemplary embodiment of the stable wine glass comprising a container having an interior surface 112 that is shaped to present the bouquet of a particular type of wine. The exterior surface 114 of the container 110 is sized to fit a human hand. The interior surface 112 is sized, in this exemplary embodiment, to minimize the mass of the container. The stable wine glass 100 further comprises a foot 120, which is wider than the exterior of the container 110.

[0046] The stable wine glass 100 has a preferred orientation when resting on a level surface such that only the foot 120 makes contact with the level surface. In this preferred orientation, the shortest distance between the top of the stable wine glass 100 and the level surface defines the height of the glass. The mass distribution of the stable wine glass 100 is controlled by selection of materials and proportioning the sizes of the elements of the stable wine glass 100 to ensure that the center of mass of the filled stable wine glass 100 is at or below about one-half the height of the stable wine glass 100. A wine glass is “filled” when the leveled top surface of the poured wine rises to just below the point where the interior surface 112 begins to turn inward toward the axis of radial symmetry. If more wine than this is put in a wine glass, the glass cannot properly present the bouquet of the wine.

[0047] Between the foot 120 and the container 110 is a filet 140 to receive a portion of the hand of the person holding the stable wine glass 100 and to optionally to strengthen the joint between the foot 120 and the container 110. The filet 140 receives one or more digits of the human hand as the hand wraps around the stable wine glass 100. The filet 140 should be sized, shaped and positioned to allow the whole inner surface of the digit (the side with the fingerprint on it) to make contact with the filet 140, foot 120, and exterior surface 114. This ensures an excellent grip on the glass. The filet 140 may be integral to the foot 120, the container 110, or both.

[0048] A centered concave portion 170 of the underside of the foot 120, as shown by the broken line in FIG. 1A, causes contact between the surface upon which the stable wine glass 100 may rest to occur under the radially outer edge of the foot 120. This improves stability on uneven surfaces. In most embodiments, the under side of the foot 120 may be dimpled, ridged, covered with a high friction material, or similarly adapted to avoid sliding on irregular surfaces such as sand, lawns, forest floors, and wet surfaces on boats. In another embodiment, the foot 120 may be shaped to maximize the stability of an asymmetric container. In yet another embodiment, the stable wine glass may be sized to fit into a cup-holder such as those used on boats.

[0049] FIG. 1B shows an exemplary embodiment of a stable wine glass comprising a container 110 having an interior surface 112 that is shaped to present the bouquet of a particular type of wine. The stable wine glass further comprises a second outer wall 150 which provides an insulating air space between the exterior surface 114 of the container 110 and the second outer wall 150. The second outer wall 150 is attached to or integral to the foot 120. The attachment of the second outer wall 150 may be continuous around the circumference of the foot 120, or may be discontinuous or irregular. In an embodiment, the second outer wall 150 may be less than completely circumferential. For example, the second outer wall 150 may extend only 90 degrees in arc around the container 110 to provide a surface for a hand to grasp. In an embodiment, the second outer wall may comprise an artistic sculpture. In “loving cup” embodiments, the stable wine glass 200 may be sized and shaped to be grasped by a plurality of hands.

[0050] A filet 140 is shown between the container 110 and the foot 120. The filet may be completely circumferential or not. A second filet 142 is also shown between the second outer wall 150 and the foot. In addition to providing structural strength for the joint between the foot 120 and the second outer wall 150, the filet 142 improves the comfort of the stable wine glass 200 in a hand. In use, the wine consumer’s hand engages the second outer wall 150, the filet 142, and the foot 120 but not container 110. Consequently, very little heat from the hand is transferred to the wine through the second outer wall 150 and the foot 120. In some alternate embodiments, portions of the outer surfaces of the foot 120, filet 140, and second outer wall 150 are shaped to adapt to wine glass racks of the sort that traditionally allow
stemmed wine glasses to be hung upside down by the foot 120. In such embodiments, sizing is also a critical factor.

[0051] FIG. 1C shows another exemplary embodiment of a stable wine glass 210 comprising a container 110 having an interior surface 112 that is shaped to present the bouquet of a white or sparkling wine. The outer surface 114 is shaped and sized, in this embodiment 210, to provide an insulating thickness of material while meeting two other design constraints. The first constraint is that the mass of the stable wine glass must be distributed to keep the center of gravity of the filled glass below one-half of the height of the glass. The second constraint is that the glass must be comfortable in the hand. Stable wine glass 210 exemplifies those embodiments where the wine is insulated from the warmth of the human hand by the wall of the container 110. The material 130, between the interior surface 112 and the exterior surface 114, may be glass, air, or similar insulating material. In a particular version of this embodiment 210, the container 110, filet 140, and foot 120 are a single piece of transparent glass or other ceramic. Glass or ceramic that is opaque in the portion of the infrared spectrum emitted by the human hand is useful, as this confines heat transfer from the hand to the wine to a slow conduction path through the foot 120. In the embodiment 210 shown in FIG. 1C, the foot 120 is wider than the container 120. In another version of embodiment 210, exterior surface 114 comprises the surface of material 130 and interior surface 112 is another material. For example, material 130 may be glass and surface 112 may be a thin layer of platinum. While using platinum has the disadvantage of obscuring the color of the wine, it will reflect a portion of the heat radiated from the hand through the glass 130. Because platinum is a noble metal it will not react chemically with the wine. Gold will work as well. It will be clear to those of ordinary skill in the art that the multi-layer compositions like those shown and described with reference to FIG. 1C may be used in any of the embodiments shown and described herein, as well as any other embodiments of the invention.

[0052] FIG. 1D shows yet another exemplary embodiment of a stable wine glass 220 comprising a container 110 comprising an interior surface 112 that is shaped to present the bouquet of a bordeaux wine. The heat transfer considerations are different for a bordeaux, served at 72 degrees Fahrenheit, than for a Champagne, served at 38 degrees Fahrenheit. Consequently, there is less need to restrict heat transfer from the hand. This embodiment of the stable wine glass 220 may be made from a single piece of machine-blown glass, as for embodiment 210, or may be made from a variety of materials such as stone, metal, fused gemstone, plastic, or ceramic. Even wood may be used if it is coated with a chemically inert layer over the wine-engaging portions of the stable wine glass 220. In an alternate embodiment, the container 110 and the foot 120 comprise different materials. For example, the foot 120, filet 140, and exterior wall 114 may comprise metal, and the container wall material 130 and inner surface 112 may comprise glass. Parts of the stable wine glass 220 that do not contact the wine, there is no particular benefit in using chemically inert materials. Compatibility with dishwasher detergents may be important in some embodiments.

[0053] FIG. 2A shows a simpler exemplary embodiment of a stable wine glass 300 comprising a container 110 having an interior surface 112 that is shaped to present the bouquet of a bordeaux wine. The stable wine glass comprises a container 110 having an interior surface 112 and an exterior surface 114, a foot 120, and a filet 140 around the bottom of container 110 and integral to the foot 120. As with other embodiments, the bottom of the container 110 is in direct contact with the foot 120: the stable wine glass 300 is stemless. For this embodiment 300, the glass or other material for the container 110 should have excellent thermal insulating properties. As an alternative to embodiment 300 where transparency can be sacrificed, a composite material may be suitable. The foot 120 of the stable wine glass 300 is wider than the container 110. In an alternate embodiment, the foot 120 is and not wider than the container 110 but is thicker to maintain a low center of mass.

[0054] FIG. 2B shows an exemplary embodiment of a stable wine glass 400 similar to the stable wine glass 300 of FIG. 2A, but with a second outer wall 150 added. The second outer wall 150 is attached only to the foot 120. In an embodiment, the foot 120 and second outer wall 150 are manufactured as one piece separately from the container 110. In a two-piece embodiment, the container 110 may be affixed to the foot 120 portion using an adhesive with good insulating properties. Second outer wall 150 is sized and shaped to provide a comfortable grip for a human hand. The foot 120 is wider than the container 110 and wider than the second outer wall 150. As with all embodiments, the mass distribution of the stable wine glass 400 is made to keep the center of mass of the wine-filled stable wine glass 400 below one-half the height of the stable wine glass 400. Those with experience in the art will appreciate that compatibility with dish washing machines will be a factor in a consumer's decision to purchase. The curvature and spacing of the second outer wall 150 should allow for machine washing of any narrow spaces, such as the one between second outer wall 150 and exterior surface 114.

[0055] FIG. 2C shows a stable wine glass 500 similar to the stable wine glass 400 of FIG. 2B, but with a third wall 154 added. The volume 152 between second outer wall 150 and third wall 154 may be an filled with air for insulation. In an embodiment, the volume 152 may be filled with glass, with the second outer wall 150 and third wall 154 comprising surfaces of that glass. Note the absence of filets in this illustration of embodiment 500: the walls 150 and 154 perform the structural support and grip-providing functions. In an alternate embodiment, a filet 140 (See FIG. 2B) may be added. The foot 120 of this particular embodiment is wider than any other portion of the stable wine glass 500. Annular space 156 may be an air space or may be at least partially filled with material. For example, space 156 may be filled with glass, optionally of a decorative color. For another example, space 156 may be at least partially filled with metal or similarly stable material. In another alternate embodiment, there are a plurality of concentric outer walls operative to insulate the wine from the warmth of the human hand. In yet another embodiment comprising a white wine container 110, space 156 may be filled with a material having a high specific heat so that the stable wine glass 500, being first chilled, will maintain the wine's chilled temperature longer.

[0056] FIG. 2D shows an exemplary embodiment of a stable wine glass 600 similar to the stable wine glass 300 of FIG. 2A, but with a second outer wall 150 added. The second outer wall 150 is attached only to the container 110.
This allows the container 110 and second outer wall 150 to be manufactured as one piece separately from the foot 120. Second outer wall 150 is sized and shaped to provide a comfortable grip for a human hand. As with other embodiments with a second outer wall 150, the hand engages the second outer wall 150 and the foot 120, but not the container 110. The foot 120 is wider than the container 110 but not wider than the second outer wall 150. This embodiment may require that the stable wine glass 600 be hand washed. In variations of the illustrated embodiment 600, the second outer wall 150 may be varied in shape and size. For example, instead of having a single circumferential groove as illustrated in FIG. 2D, second outer wall 150 may be shaped to provide a plurality of grooves. For further example, the portions of the second outer wall may extend below the top surface of the foot at a radial distance from the common axis of symmetry greater than the radius of the foot.

[0057] FIG. 2E shows an exemplary embodiment of a stable wine glass 700 similar to the stable wine glass 400 of FIG. 2B, but with a foot that is wider than the container 110 and not as wide as the second outer wall 150. The second outer wall 150 is attached only to the foot 120 and has a filet 142 between the second outer wall 150 and the foot 120. The advantage of such a foot 120 proportion is that it gives good stability for the filled container 110, but still fits the hand in a familiar way. In particular variations of this embodiment 700, the second outer wall 150, filet 142, and foot 120 may be shaped, sized, and proportioned to maximize comfort in the hand within three design constraints. First, as with most embodiments having a second outer wall 150, the second outer wall 150 should not extend upward to a point where it engages the lips of someone drinking from the glass. Second, the mass distribution of the stable drinking glass should maintain the center of mass of the filled stable wine glass 700 at or below about one-half the height of the stable drinking glass. Third, the primary function of the second outer wall, that of insulating the wine from the warmth of the human hand, should not be destroyed.

[0058] FIG. 3 shows an exemplary embodiment of a stable wine glass 800 comprising a container 110 having an interior surface 112 that is shaped to form a wine-tasting glass. A wine-tasting glass is suitable for presenting bouquets from both white and red wines. The foot 120 is wider than the container 110 and not as wide as the second outer wall 150. The second outer wall 150 is integral to both the foot 120 and the container 110. The volume 152 defined by the filet 140, exterior wall 114, the foot 120, and the second outer wall 150 may be filled with air, glass, or other insulating or ornamental material. The container 110 is in direct contact with the foot 120, and may, in alternate embodiments, be integral to the foot 120.

[0059] FIG. 4A shows an exemplary embodiment of a stable wine glass 900 comprising a container 110 which comprises an interior surface 112 that is shaped to form a flute for white wine or champagne and an exterior surface 114 sized and shaped, in this embodiment 900, to minimize the mass of the container 110. The stable wine glass 900 further comprises a foot 120 and a filet around at least a portion of the base of the container 110 and on the foot 120. The foot 120 is illustrated in a functional configuration, wider than the container 110, with the thickness generally increasing with radial distance from the center and an overall thickness suggestive of the mass required to stabilize the stable wine glass 900. Those of skill in the art will recognize that, within the design constraints on mass distribution, significant artistic license may be taken with the actual shape of the foot 120 and the underside concavity 170. For example, the outer edges may be shaped as a continuation of the curvature of a portion of the container 110. Likewise, by further example, the foot may be beveled, faceted, multiply curved, or ornamented. By yet further example, the underside concavity 170 may be smooth, stepped, ridged, spiked, or dimpled and may be shaped in any way consistent with the stability requirement.

[0060] FIG. 4B shows an exemplary embodiment of a stable wine glass 1000 which is similar to the stable wine glass 900 but which has a second outer wall 150 around a lower portion of the container 110. The second outer wall is integral with the foot 120. The foot 120 is wider than the container 110 and wider than the second outer wall 150. The second outer wall 150 may be shaped and sized to comfortably receive the hand, as known by those with skill in the art of ergonomics.

[0061] FIG. 4C shows an exemplary embodiment of a stable wine glass 1100 which is similar to the stable wine glass 1000 but in which the second outer wall 150 around a lower portion of the container 110 touches on the exterior surface 114. In an embodiment, the second outer wall 150 is made of a resilient insulating material, such as a metal-boron-fiber-epoxy composite or a resilient glass. The filet 140 is also resilient, and the second outer wall 150, the foot 120, and the filet 140 are integral and form a first part. The container 110 comprises a second part which, before use, is pushed into the first part through the top of the second outer wall 150 and further down until the bottom of the container seats in the resilient filet 140. The force exerted on the container 110 by the resilient second outer wall 150 holds the container 110 in place during use. The volume 152, located between the filet 40 and the second outer wall 150, is filled with air in embodiment 1100. To improve the range of motion of the second outer wall 150, the second outer wall 150 may be divided circumferentially into a plurality, usually at least four, wall sections.

[0062] In another embodiment, the second outer wall 150 may be fixed to the container 110. Volume 152, defined by the filet 140, exterior surface 114, the foot 120, and the second outer wall 150, may be filled with air, glass, or other insulating, functional, or ornamental material.

[0063] FIG. 4D shows an exemplary embodiment of a stable wine glass 1200 which is similar to the stable wine glass 1000 but in which the foot 120 is wider than the container 110 but not wider than the second outer wall 150. The volume 152, between the exterior surface 114 and the second outer wall 150, is filled with air in embodiment 1200. The stable wine glass 1200 may be manufactured as a single unit. In another embodiment, the second outer wall 150, the foot 120, and the filet 140 are integral and form a first part. The container 110 comprises a second part which is fixed to the first part such that the bottom of the container touches the foot 120 and seats in the filet 140.

[0064] In hot, humid climates, water may condense on chilled surfaces. When water condenses on the exterior surface 114 of stable wine glass 1200, it may run down the exterior surface 114 and collect in the annular container formed by the second outer wall 150, the top of the foot 120,
the filet 140, and the exterior surface 114. This can be disconcerting to the person imbibing wine from the stable wine glass 1200, as the water may pour down the imbibers chest when the stable wine glass 1200 is tipped up for drinking. In an embodiment designed to avoid this difficulty, the bottom of the second outer wall 150 is perforated at intervals around its circumference to prevent accumulation of water. In another embodiment, an absorbent material, such as an elegant fabric napkin, may be wrapped around the container 114 and inside the second outer wall to soak up the moisture. The napkin may further provide insulation for the container 114. In yet another embodiment, both perforations and absorbent material are used to control the accumulation of condensate. In still yet another embodiment, the second outer wall 150 is shaped to prevent any accumulated water or spilled wine from pouring out when the stable wine glass 1200 is tilted up for drinking.

[0065] FIG. 5A shows an exemplary embodiment of a stable wine glass 1300 comprising a container 110 which comprises an interior surface 112 that is shaped to present the bouquet of a light red wine and an exterior surface 114 sized and shaped, in this embodiment 1300, to minimize the mass of the container 110. The stable wine glass 1300 further comprises a foot 120 and a filet around at least a portion of the base of the container 110 and on the foot 120. The foot 120 is illustrated in a functional configuration, wider than the container 110, with the thickness generally increasing with radial distance from the center and an overall thickness suggestive of the mass required to stabilize the stable wine glass 1300. The foot 120 for stable wine glass 1300 has a mass distribution that provides more mass near the center than the foot 120 in FIG. 4A. The container may be made of a material with excellent insulating properties such as a boron-epoxy composite. The interior surface 112 may comprise a layer of glass or noble metal to reassure the wine connoisseur that the wine will not chemically interact with the container 110 and to make cleaning easier. At least a top, lip-engaging, portion of the exterior surface 114 comprises glass or a noble metal.

[0066] FIG. 5B shows an exemplary embodiment of a stable wine glass 1400 which is similar to the stable wine glass 1300 with a second outer wall 150. Furthermore, the foot 120 is wider than the container 110 but not wider than the second outer wall 150. The volume 152, between the exterior surface 114 and the second outer wall 150, is filled with air in embodiment 1400. The stable wine glass 1400 may be manufactured as a single unit. In another embodiment, the second outer wall 150, the foot 120, and the filet 140 are integral and form a first part. The container 110 is manufactured as a second part which is fixed to the first part such that the bottom of the container touches the foot 120 and seats in the filet 140.

[0067] FIG. 5C shows an exemplary embodiment of a stable wine glass 1500 which is similar to the stable wine glass 1400 with a substantially thicker second outer wall 150 which is integral to the foot 120. The additional mass of the second outer wall 150 provides a surface for engraving or sculpting and adds stability by maintaining the center of gravity below one-half of the height of the glass. The shape of the outer wall 150 may be any shape that can be grasped by the hand.

[0068] FIG. 5D shows an exemplary embodiment of a stable wine glass 1600 which is similar to the stable wine glass 1500 but in which the second outer wall is merged with the exterior surface 114 of the container 110 at the upper end of the second outer wall 150. Volume 152 may be filled with air, a glass with different physical properties, or other insulating material. For example, glass with different physical properties may be opaque, colored, have exceptional insulating properties, or have different optical properties. The volume 152 is shown as bounded with curved surfaces but, in alternate embodiments, the volume 152 may be bounded with flat surfaces or combinations of flat and curved surfaces. The surfaces bounding volume 152 may be polished, roughened, coated, or otherwise treated.

[0069] FIG. 6 shows an exemplary embodiment of a stable wine glass 1700 comprising a container 110 which comprises an interior surface 112 that is shaped to present the bouquet of a red wine and an exterior surface 114 sized and shaped, in this embodiment 1700, to minimize the mass of the container 110. The foot 120 has a traditional pedestal shape. This pedestal shape is pleasing to the eye but raises the center of mass of the filled stable wine glass 1700. The mass of the foot 120 may be increased to compensate for the raising of the container 110. The second outer wall 150 is fixed to the foot 120 and is strengthened by a filet 140.

[0070] FIG. 7 shows an exemplary embodiment of a stable wine glass 1800 comprising a container 110 which comprises an interior surface 112 that is shaped to present the bouquet of a red wine and an exterior surface 114 sized and shaped, in this embodiment 1800, to minimize the mass of the container 110. A thick second outer wall 150 comprises a circumferential wrapper of insulating material. Second outer wall 150 may be comprised of glass, rubber, wood, polyurethane foam, Melanie foam, composite insulators, fabric, paper, or similar insulating materials. Second outer wall 150 is fixed to the exterior surface 114 of the container 110 and to a portion of the top of the foot 120. Container 110 rests directly on the foot 120 and, in an embodiment, may be integral to the foot 120. In alternate embodiments, the second outer wall may be releasably attached to the exterior surface 114 of the container 110.

[0071] FIG. 8A shows an exemplary embodiment of a stable wine glass 1900 comprising a container 110 which comprises an interior surface 112 that is shaped to present the bouquet of a red wine and an exterior surface 114 sized and shaped, in this embodiment 1900, to minimize the mass of the container 110. Foot 120 is wider than the container 110. Second outer wall 150 comprises, in embodiment 1900, the outer surface of the material filling volume 152. This material may be glass, wood, polyurethane, melanite, rubber, a composite, or similar insulating material. The container 110 is integral with the foot 120 and the second outer wall 150.

[0072] In an alternate embodiment, the foot and second outer wall are integral, comprising a first part, and the container 110 comprises a second part. Before use, the second part is inserted in the first part. In some two-part embodiments, the resiliency of the material comprising the second outer wall 150 holds the container 110 in place during use. Preferably, the second outer wall 150 extends upward to a point above the inflection point of the container 110.
FIG. 8B is a plan view of the stable wine glass 1900 showing the foot 120, the second outer wall 150, and the exterior surface 114, the interior surface 112, and the lip 500 of the container 110.

FIG. 9 shows an exemplary embodiment of a stable wine glass 2000 comprising a container 110 which comprises an interior surface 112 that is shaped to present the bouquet of a red wine and an exterior surface 114 sized and shaped, in this embodiment 2000, to minimize the mass of the container 110. In some alternate embodiments, the exterior surface 114 may be sized and shaped for at least one of forming a high-friction interface with the second outer wall 150, lowering the center of mass, and adapting to wine glass racks of existing design. The resilient material comprising the second outer wall 150 is shaped cylindrically. A resilient pad 160 is provided at the junction of the container 110 and the foot 120. The pad 160 may be above the foot 120, as shown, or, in an alternate embodiment, may be at least partially recessed into the foot 120. The purpose of the pad 160 is to cushion the glass container 110 from impacts with a glass foot 120. The second outer wall 150, the pad 160, and the foot 120 are integral and form a first part. The container 110 comprises the second part. In an alternate embodiment, the second outer wall 150 and the foot 120 are integrated to form a first part, and the container 110 and the pad 160 are integrated to form a second part. In some alternate embodiments, the pad 160 comprises the same material as the container 110. In some embodiments, the second outer wall 150 may be shaped to increase the comfort of grasping the stable wine glass 2000.

FIG. 10A shows the stable wine glass 200 in a tilted position. The container 110 has been filled with wine 190. In the tilted position shown, the center of mass 192 is above the foot 120. The center of mass 192 is symbolized in the drawings by a circle with crossed diameters. The position shown is stable to the extent that the glass will not tip over and spill from this position. If the stable wine glass was placed in the position shown and released, it would fall counterclockwise back to a resting position on a horizontal surface. If the stable wine glass 200 was placed on a surface at the tilt angle shown, it would remain in place and not spill. FIG. 10B shows, for comparison, a prior art stemmed glass 2001 having the same angular tilt. The center of mass 192 of glass 2001 is no longer over the foot of the glass, so the position is unstable. If released from this position, the wine glass 2001 will fall, rotating clockwise, and spill, regardless of whether the surface upon which it rests is horizontal or tilted to fully contact the foot.

The invention has been shown and described by reference to a plurality of exemplary embodiments. The invention applies to wine glasses of any interior surface 112 shape and is not limited to the shapes shown as examples. Likewise, the variety of configurations of the foot 120 is intended to be exemplary of all feet 120 that provide the necessary mass distribution, resting surface interface, and human hand interface for a stable wine glass. The variety of shapes of the second outer walls 150 shown is not intended as limiting the invention to the exemplary shapes shown, but to encompass all second outer walls 150 that meet the human hand interface, thermal, and mass distribution requirements for a stable wine glass. Those of skill in the art will appreciate the variety of materials that can be used for making containers 110, feet 120, and second outer walls 150. Embodiments of the invention contemplate those materials.

The foregoing description has described selected embodiments of stable wine glasses. While the invention has been particularly shown and described with reference to selected embodiments thereof, it will be readily understood by one of ordinary skill in the art that, as limited only by the appended claims, various changes in form and details may be made therein without departing from the spirit and scope of the invention.

I claim:

1. A stable wine glass, comprising:
   a container, comprising an open top, a closed, rounded bottom, and sides radially symmetrical about an axis, the sides forming interior and exterior container surfaces, the interior surface shaped to present a bouquet of at least one predetermined type of wine; and
   a foot, proximate to the exterior bottom of the container.

2. The stable wine glass of claim 1 wherein a second outer wall is fixed to at least one of the foot and the container.

3. The stable wine glass of claim 1 further comprising a filet against the second outer wall and the foot, the filet sized, shaped, and positioned to receive the inner surface of at least one digit of a human hand.

4. The stable wine glass of claim 1 wherein the sides of the container comprise sides sufficiently thick to provide thermal insulation between the exterior surface and the interior surface over at least a hand-held portion of the container.

5. The stable wine glass of claim 1 wherein an insulating material covers at least a portion of the exterior surface of the container.

6. The stable wine glass of claim 1 wherein the container comprises
   a thermally insulating material;
   a chemically inert material on the interior surface; and
   a chemically inert material on at least a lip-engaging portion of the exterior surface.

7. The stable wine glass of claim 1 further comprising a filet against the container and the foot, the filet sized, shaped, and positioned to at least one of receive at least one digit of a human hand and provide structural support to the container.

8. A stable wine glass, comprising:
   a container comprising an open top, a closed bottom, and sides radially symmetrical about an axis, the sides forming interior and exterior container surfaces, the interior surface shaped to present a bouquet of a predetermined type of wine;
   a foot, wherein the foot is at least one of integral to and in direct contact with the exterior bottom of the container; and
   at least one of a filet against and a pad between the container and the foot.

9. A stemless wine glass, comprising:
   a container comprising an interior surface shaped to present a bouquet of at least one predetermined type of beverage;
a foot, proximate to the exterior bottom of the container;
and
a second outer wall, configured
generally concentric with the container; and
fixed to at least one of the foot and the container.

10. The stemless wine glass of claim 9 wherein the second outer wall comprises a surface partially circumscribing the container.

11. The stemless wine glass of claim 9 wherein the foot comprises a generally disc-shaped mass with a diameter less than or equal to the diameter of the second outer wall, the foot shaped on its lower surface to contact level surfaces on its outer edge.

12. The stemless wine glass of claim 11 wherein the foot further comprises a pedestal portion.

13. The stemless wine glass of claim 11 wherein the foot has a diameter greater than the diameter of the container.

14. A method for manufacturing a stable wine glass, the method comprising
forming a container comprising an internal surface shaped to present the bouquet of a wine, the container having a bottom;

forming a foot; and
bringing the foot into a relationship with the container wherein the container is maintained in an upright orientation by the relationship of the container to the foot.

15. The method of claim 14 wherein the steps of forming a foot and bringing the foot into a relationship with the container are combined to comprise forming the foot and the container as a single unit.

16. The method of claim 15 wherein the step of bringing the foot into a relationship with the container comprises at least one of fixedly and releasably attaching the foot to the bottom of the exterior of the container.

17. The method of claim 14 further comprising forming a second outer wall fixed to at least one of the foot and the container.

18. The method of claim 17 further comprising forming the second outer wall as a single unit with at least one of the foot and the container.

19. The method of claim 14 further comprising the step of covering at least a portion of the exterior surface of the container with an insulating material.

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