

A WINE BOTTLE WITH DECORATIVE PATTERN AND MANUFACTURING PROCESS THEREOF

Field of the invention

The present invention relates to a vessel, more specifically to a wine bottle with a
5 decorative pattern.

The present invention also relates to a process for manufacturing a wine bottle
with decorative pattern.

Background of the invention

In prior art, a wine bottle is only used for a vessel containing wine, has a single
10 outward appearance and mono-function, and is unable to provide more aesthetic
perception to the people. While in case of ample supply in market commodities the
consumers have enough space in selection, product appearance plays an important role
in attraction and excitation to the option of the consumers. Furthermore, the wine
being frequently used as a merry-making beverage and present in the banquets, and
15 wine bottles are often stored up as collections. Chinese patent ZL972006753 disclosed
a glass wine bottle consists of a transparent glass bottle, formative ornamentals and a
base. Although this bottle is decorated via the formative ornamentals installed in the
base and aesthetic feeling is brought to the wine bottle, the pattern and bottle being
separated and the structure is complicated. And more parts and a higher fabrication
20 cost are resulted in.

Chinese Patent CN2292763Y discloses a wine bottle for construction ornament.
The wine bottle is formed with a regular geometrical shape. A recess is provided in a

bottom portion of the wine bottle for receiving a head of another wine bottle, thereby these used empty wine bottles can be used as building material by stacking each other to form a bottle wall. However, this kind of wine bottle is not with a decorative pattern.

Chinese Patent CN2324117Y discloses a wine bottle with an inner part. The inner
5 part is made of glass and formed at the bottom portion of the wine bottle. The peripheral wall of the inner part is decorated with paintings. Circuit enabling to shine and make a sound is provided inside the inner part to light up the paintings. However, the paintings are separated from the peripheral wall of the inner part since painted on the glass, which results in that the paintings are easily peeled off.

10 To securely combine a decorative pattern with a glass, various means are adopted, such as baking. During a baking process of glass articles, overglaze colors are spreaded on surfaces of the glass articles and then heated at a lower temperature to be stuck on the surfaces. However, the overglaze colors are still easy to be peeled off. Moreover, when the process is adopted to a bottle-shaped glass article, it is easy to cause fracture
15 of the glass bottle during the heating stage.

Summary of the invention

The object of the invention is to provide a wine bottle being incorporated with a decorative pattern and a bottle, wherein the decorative pattern and the bottle are merged into a whole.

20 Another object of the invention is to provide a process for manufacturing the wine bottle with decorative pattern.

To realize above objects, the technical scheme of the invention is:

A wine bottle with decorative pattern, comprises

a bottle for containing the liquid;

a convex base projected to the inside of the bottle is provided at the bottom of said bottle, which divides said bottle into two portions: a space for containing the liquid and

5 a concave portion; wherein

a decorative pattern portion is further provided on the internal wall of said concave portion, wherein said decorative pattern portion and the internal wall of said concave portion are merged into a whole.

A process for manufacturing the wine bottle with decorative pattern, comprises

10 the following steps;

a) covering a decal paper with decorative pattern on the internal wall of concave portion in said wine bottle;

b) placing said wine bottle covered with the decal paper into a furnace for preheating;

15 c) keeping the preheated wine bottle in the furnace to be decorating firing in a maintained definite temperature;

d) cooling the decorating-fired wine bottle, to attain the wine bottle with decorative pattern.

According to one aspect of the invention, the present invention provides a wine
20 bottle having a decorative pattern portion and a bottle, wherein the decorative pattern portion and the bottle are merged into a whole, the decorative pattern portion may be melt-linked or baked on the internal wall of the concave portion at the bottom of the

bottle.

According to another aspect of the invention, the present invention provides a process for manufacturing the wine bottle with decorative pattern, the decorative pattern and the bottle are incorporated into a whole via the steps of covering a decal
5 paper with the overglaze colors of decorative pattern onto the internal wall of concave portion in the wine bottle, placing the bottle into a furnace for preheating, decorating firing and cooling etc. When the wine bottle is heated at a certain temperature, the glass surface starts to be softened and enters into ion exchange with the overglaze colors of the decorative pattern thereon. The overglaze color and the glass material of
10 the bottle are melt-linked to be integral.

According to another aspect of the invention, in the process of the present invention, the decorative pattern portion and the bottle are incorporated into a whole via melt-linking or baking, the melt-linking is conducted under a higher temperature 300~650°C, preferably under 450~600°C, more preferably at 480°C or 590°C, an
15 overglaze color is entirely melt-linked at the glass surface; while baking is carried out under 60~300°C, preferably under 70~130°C, more preferably at 80°C or 120°C.

According to another aspect of the invention, to ensure the quality of the whole process, the decorative pattern portion must be smooth, bubble-free and nondestructive. To reduce the fracture of wine bottles, heating mode of hump temperature
20 characteristic is employed in the process of the present invention, i.e, temperature in preheating is slowly raised, decorating firing is conducted in a relatively steady temperature, cooling is done in slow lowering temperature, the time of cooling

accounts for about half of the overall manufacturing process time in the furnace.

Brief description of drawings

The present invention will become more apparent as the disclosure of the present invention is made with reference to the accompanying drawing.

5 FIG.1 is a front section view of a wine bottle with decorative pattern in the present invention;

FIG.2 is a section view taken along A-A line in FIG.1;

FIG.3 is the hump temperature characteristic of the furnace in the process of the present invention.

10 Detail description of the preferred embodiment

[Example 1]

A preferred embodiment of the wine bottle with decorative pattern in the present invention is shown in FIG.1 and FIG. 2, a convex base 2 provided at the bottom of transparent glass wine bottle 1 is projected to the inside of the bottle, the convex base 2
15 may be arbitrarily shaped, e.g. cylindrical, polygonal etc., the bottle is divided into two portions by the convex base 2: a space is used for containing the liquid; the other space is the concave portion 4. A decorative pattern portion 3 is further provided on the internal wall of concave portion 4, the decorative pattern portion 3 and the internal wall of concave portion are merged into a whole via melt linking or baking. When the
20 wine bottle is using, the decorative pattern can be seen through the transparent glass wine bottle.

[Example 2]

A preferred embodiment of the process for manufacturing the wine bottle with decorative pattern of the invention is as follows:

A decal paper is covered onto the internal wall of the concave portion in the bottle
5 and an overglaze color is provided on said decal paper, the decal paper stuck on the internal wall is required to be smooth, bubble-free and nondestructive, then the wine bottle is placed into the furnace. The whole manufacturing process in the furnace is divided into three stages, i.e. preheating, decorating firing and cooling, the temperature and time of various stages are set adopting the hump temperature characteristic mode
10 as shown in FIG. 3. The temperature of the furnace is raised slowly to preheat the wine bottle, raising temperature slowly is to prevent the fracture of wine bottle due to abrupt heating, when the temperature is raised to 480°C, the furnace temperature is controlled and maintained at this constant temperature to carry out decorating firing, the temperature variation of decorating firing should not exceed $\pm 20^{\circ}\text{C}$. When the
15 overglaze color of the decorative pattern on the decal paper surface melts, meanwhile the glass surface starts to be softened, the overglaze color has been entirely melt-linked on the glass surface and the decorating firing stage is completed. Then the process enters the cooling stage: temperature is gradually lowered in this stage, to prevent the generation of stress and eliminate the residual stress while reducing the fracture rate of
20 wine bottles, the time of cooling accounts for about half of the overall manufacturing process time in the furnace.

[Example 3]

Cover the decal paper on the internal wall of concave portion in the bottle, on which the overglaze color of decorative pattern is provided. The decal paper is stuck on the internal wall and is required to be smooth, bubble-free and nondestructive. The

5 wine bottle is placed into the furnace and the temperature and time of various stages are set adopting the hump temperature characteristic mode. Raise the furnace temperature slowly to preheat the wine bottle, when the temperature is raised to 590°C, the furnace temperature is controlled and maintained at this constant temperature to carry out decorating firing. During decorating firing, temperature variation of the

10 furnace should not exceed $\pm 15^{\circ}\text{C}$. When the overglaze color of decorative pattern on the surface of decal paper is melted, meanwhile the glass surface starts to be softened, the overglaze color is entirely and firmly melt-linked on the glass surface, decorating firing stage is completed. Then the cooling stage is entered, the temperature is gradually lowered, and the time of cooling accounts for about half of the overall

15 manufacturing process time in the furnace.

[Example 4]

Cover the decal paper on the internal wall of concave portion in the bottle, on which the overglaze color of decorative pattern is provided. The decal paper is stuck on the internal wall and is required to be smooth, bubble-free and nondestructive.

20 Place the wine bottle into the furnace, the whole manufacturing process in the furnace is divided into three stages, i.e. preheating, decorating firing and cooling. The temperature and time of each stage are set adopting the hump temperature

characteristic mode. The furnace temperature is slowly raised to preheat the wine bottle, when the temperature is raised to 80°C, it is controlled and maintained at this constant temperature to carry out decorating firing. Temperature variation of the furnace in decorating firing should not exceed $\pm 10^{\circ}\text{C}$. When the overglaze color of decorative pattern is baked on the glass surface, decorating firing stage is completed. Then cooling stage is entered, the temperature is gradually lowered in this stage, and the time of cooling stage accounts for about half of the overall manufacturing process time of the preheating, decorating firing and cooling process.

[Example 5]

Cover the decal paper on the internal wall of concave portion in the bottle, on which overglaze color of decorative pattern is provided. The decal paper is stuck on the internal wall and is required to be smooth, bubble-free and nondestructive. Place the wine bottle into the furnace and the overall manufacturing process in the furnace is divided into three stages, i.e., preheating, decorating firing and cooling. The temperature and time of each stage are set adopting the hump temperature characteristic mode. The furnace temperature is slowly raised to preheat the wine bottle, when the temperature is raised to 120°C, it is controlled and maintained at this constant temperature to carry out decorating firing. The temperature variation in decorating firing should not exceed $\pm 10^{\circ}\text{C}$. When the overglaze color of decorative pattern is baked at the glass surface, decorating firing stage is completed. Then the cooling stage is entered, in this stage the temperature is gradually lowered, and the time of cooling stage accounts for about half of the overall manufacturing process time

in the preheating, decorating firing and cooling process.

The wine bottle with decorative pattern of the present invention, whose outward appearance is further beautified via the changes of decorative pattern portion to express various patterns and colors and the decorative pattern and the bottle are
5 merged into a whole, has no excessive parts and is allowed for packing and use.

The process of manufacturing the wine bottle with decorative pattern in the present invention is simple and the rate of finished product of wine bottles is high. On the finished wine bottle, the decorative pattern is firmly incorporated with the wine bottle. The pattern is smooth and integrated and the colors are brilliant. The surface is
10 full of luster and has a very artistic effect.

While the present invention has been described with reference to the above preferred embodiments, it should be understood that various changes and modifications could be made by those skilled in the art without departing from the protection scope of the appended claims.

What is claimed is:

1. A wine bottle with decorative pattern, comprises

a bottle for containing the liquid;

a convex base projected to the inside of the bottle is provided at the bottom of said

5 bottle, which divides said bottle into two portions: a space for containing the liquid and a concave portion; wherein

a decorative pattern portion is further provided on the internal wall of said concave portion, and

wherein said decorative pattern portion and the internal wall of said concave portion

10 are merged into a whole.

2. A wine bottle with decorative pattern according to claim 1, wherein said decorative pattern portion is melt-linked on said internal wall.

3. A wine bottle with decorative pattern according to claim 1, wherein, said decorative pattern portion is baked on said internal wall.

15 4. A wine bottle with decorative pattern according to claim 1, wherein said bottle is made of transparent glass.

5. A process for manufacturing the wine bottle with decorative pattern, comprises the following steps:

a) covering a decal paper with decorative pattern on the internal wall of concave portion in said wine bottle;

20 b) placing said wine bottle covered with the decal paper into a furnace for preheating;

c) keeping the preheated wine bottle in the furnace to be decorating firing in a maintained definite temperature; and

d) cooling the decorating-fired wine bottle, to attain the wine bottle with decorative pattern.

5 6. A process according to claim 5, wherein the temperature is slowly raised to 300~650°C in said preheating of step 2).

7. A process according to claim 6, wherein the temperature is slowly raised to 450~600°C in said preheating of step 2).

8. A process according to claim 7, wherein the temperature is slowly raised to 480°C
10 in said preheating of step 2).

9. A process according to claim 7, wherein the temperature is slowly raised to 590°C in said preheating of step 2).

10. A process according to claim 6, wherein in said decorating firing of step 3), the temperature reached in preheating of step 2) is maintained until the decorative pattern on
15 the decal paper is melt-linked onto the glass surface of said wine bottle.

11. A process according to claim 10, wherein the temperature variation of the furnace in said decorating firing should not exceed $\pm 20^{\circ}\text{C}$.

12. A process according to claim 11, wherein the temperature variation of the furnace in said decorating firing should not exceed $\pm 15^{\circ}\text{C}$.

20 13. A process according to claim 10, wherein the temperature is gradually lowered and slowly cooled in said cooling of step 4).

14. A process according to claim 13, wherein the time of said cooling in step 4)

accounts for half of the overall manufacturing process time in said preheating, decorating firing and cooling process.

15. A process according to claim 5, wherein the temperature is slowly raised to 60~230°C in said preheating of step 2).

5 16. A process according to claim 15, wherein the temperature is slowly raised to 70~130°C in said preheating of step 2).

17. A process according to claim 16, wherein the temperature is slowly raised to 80°C in said preheating of step 2).

10 18. A process according to claim 16, wherein the temperature is slowly raised to 120°C in said preheating of step 2).

19. A process according to claim 15, wherein the temperature reached for preheating in step 2) is maintained for said decorating firing in step 3) until said decorative pattern is baked on the glass surface of said wine bottle.

15 20. A process according to claim 15, wherein the temperature variation of the furnace in said decorating firing process should not exceed $\pm 10^{\circ}\text{C}$.

21. A process according to claim 16, wherein the temperature is gradually lowered and slowly cooled in said cooling of step 4).

22. A process according to claim 21, wherein the time of said cooling in step 4) accounts for about half of the overall manufacturing process time in said preheating, decorating firing and cooling process.

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