FREEZING CRACK OR DISTORTION PROOF COOLING UTENSIL

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ABSTRACT

The present invention relates to a cooling utensil, which is a proof of freezing-crack and distortion. More particularly, an internal cavity of the utensil is fully filled the water to freeze in the freezer for cooling the serving food, such as a law fish, fruit, cold noodle or beer to feel fresh and tasty. For using the cooling bowl, the cooling cavity is filled the water or coolant for freezing. The cooling bowl is using for serving food. The cooling cavity is formed between the upper part and the lower part. The lower part is used a base to support the upper part. The upper part has same shape and size of the lower part for placing over the lower part. The elastic plate having flexibility and elastically restoring force is attached to the lower part, the upper part for assembling. Further, the cooling bowl having a cooling cavity is filled the water or coolant and freeze to use serving food. The lower part has built a dual wall to form a vacuum gap between the inner wall and the outer wall for insulation, so that the outer wall has no condensed water gained. The elastic tube having elastically restoring force is inserted through the water inlet (33), the plug bolt (5#) mounted at the mouth of the water inlet (33), for sealing the water filled cavity.
FREEZING CRACK OR DISTORTION PROOF COOLING UTENSIL

TECHNICAL FIELD

[0001] The present invention relates to a utensil for maintaining cold temperature. More particularly, the utensil has a special built-in compartment to fill the water for cooling or freezing in the freezer. The utensil would not freeze-crack or distortion while the water in the utensil compartment is freezing in the refrigerator. Therefore, the food, such as a low fish (sashimi), fruits, cold noodle or beer on this utensil can be kept fresh and tasty as long as the utensil maintains the cool temperature for a quite long time.

BACKGROUND ART

[0002] A conventional utensil has an internal cavity to fully or partially fill the water for cooling or freezing. If the cavity is fully filled the water, it will cause the utensil broken due to the volume expansion while the water is freezing in the freezer. Depending on the material, the utensil will be cracked for the ceramic or glass, and will be distorted or burst for the metal plate or plastic product. As a result, the damaged utensil can not longer be used.

[0003] Accordingly, the internal cavity of the utensil is not fully filled the water for an air pocket. If the water is freezing, the air pocket, which is formed on top of the ice, is caused an inferior heat transfer between the ice and the food on the utensil.

[0004] On the other hand, if the utensil is put upside down while the water is freezing in the freezer, the freezing utensil might be good heat transfer at the beginning of usage, but it will not go longer as the ice start melting to form the air pocket below the contacting surfaces. The cooling effect between the ice and the food on the utensil will be rapidly decreased. Therefore, it is hard to achieve the purpose of maintaining the food cooling fresh and tasty during the eating.

[0005] Other conventional cooling utensil has a separated cooling unit, which has a form of a drawer for filling ice or dry-ice and inserting into underneath of the utensil to indirectly contacting the serving food. However, this kind of conventional utensil usually has a big gap between the drawer and utensil body. Due to the large gap, the cooling effect is rapidly vanished.

[0006] It is also inconvenient to handle the main body of the utensil, and the separated cooling unit for separately preparing the ice or dry ice.

DISCLOSURE OF INVENTION

Technical Problem

[0007] In order to solve the problems of the conventional utensils, the non-crack and distortion utensil of the present invention has developed. The purpose of the present invention is to provide a flexible tube or a compartment being made of an elastic plate with restoring capability. The compartment is enveloped by the upper part and the lower part of the utensil with a lid for filling the water.

[0008] It is demanded a new cooling utensil, which would not be cracked or distorted during the freezing process due to the volume expansion. Even if the ice inside of the utensil is melting, the low temperature must be maintained to keep the food in cool condition for a long time. It is also required a simple structure for easily manufacturing by using the various materials and assembling the product with lower cost. So, it must be possible to design the various styles of the utensils. It must have durability not to explode, even though the utensil is heated on the flame by a mistake.

Technical Solution

[0009] In order to achieve the aforementioned purpose, the cooling utensil of the present invention has a compartment to fill the water or coolant for freezing to serving. Such a compartment, which is made of an elastic plate having restoring capability, has formed a cavity between the upper part and lower part of the utensil. The outer surface of the upper part forms the various shapes of dishes or containers for directly contact the food, and the outer feature of the lower part forms a base of the utensils, such as a disk-shaped foundation, a standing legs or supporter. The upper part and lower part are brought together to be one body of the utensil by binding means, such as an assembling or welding.

[0010] The usage of the cooling utensil of the present invention is simple as follows: first, fill the water or coolant in the compartment, next, the utensil is placed in the freezer until the water is freezing. After completely freezing the water, the utensil is used to contain the food on it. The upper part, which is directly contacting the food, has assembled with the lower part to form a body. An elastic tube is installed between the upper part and the lower part for filling the water. A water inlet is connected the elastic tube, and a plug bolt is used for sealing the inlet.

ADVANTAGEOUS EFFECTS

[0011] The cooling utensil of the present invention can be produced by assembling the parts. Even if, the water is fully filled in the elastic tube and freeze in the freezer, the utensil of the present invention will not be crack or distortion because the elastic tube will be expanded as expanding the volume of freezing ice. As the ice is melting, the ice floats over the melted water to keep contacting the upper part of the utensil. Therefore, the serving food on the upper part of the utensil will be kept cooling.

[0012] The parts have simple configurations to easily assemble together. Thus, it will reduce the manufacturing cost. It is also possible to design various shapes and select various materials. The cooling utensil of the present invention is provided a safety valve for preventing explosion, in case of unaware heating. The cooling utensil of the present invention is also provided a thermometer. Thus, the cooling is felt by visual, so that the serving food is felt fresh and tasty to stimulate the appetizer. The cooling utensil of the present invention is also provided a cover for maintaining the cooling for a longer time.

[0013] It is also possible to fill a coolant in the elastic tube for efficiently prolong the cooling time for the food, which is required cooling condition to serve or store.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] FIG. 1 is a schematic view showing the exploded cooling utensil according to the first embodiment of the present invention.

[0015] FIG. 2 is the schematic view of an assembled cooling utensil according to the first embodiment of the present invention.
FIG. 3 is the cross sectional view of the cooling utensil according to the first embodiment of the present invention.

FIG. 4 is a plug bolt of the cooling utensil according to the first embodiment of the present invention.

FIG. 5 is a schematic view showing the exploded cooling utensil according to the second embodiment of the present invention.

FIG. 6 is the cross sectional view of the cooling utensil according to the second embodiment of the present invention.

FIG. 7 is a schematic view showing the exploded cooling utensil according to the third embodiment of the present invention.

FIG. 8 is the cross sectional view of the cooling utensil according to the third embodiment of the present invention.

FIG. 9 is a schematic view showing the exploded cooling utensil according to the fourth embodiment of the present invention.

FIG. 10 is the cross sectional view of the assembled cooking utensil according to the fourth embodiment of the present invention.

FIG. 11 is a schematic view showing the exploded cooling utensil according to the fifth embodiment of the present invention.

FIG. 12 is the cross sectional view of the assembled cooking utensil according to the fifth embodiment of the present invention.

FIG. 13 is a schematic view showing the exploded cooling utensil according to the sixth embodiment of the present invention.

FIG. 14 is the cross sectional view of the assembled cooking utensil according to the sixth embodiment of the present invention.

FIG. 15 is a schematic view showing the exploded cooling utensil according to the seventh embodiment of the present invention.

FIG. 16 is the cross sectional view of the assembled cooking utensil according to the seventh embodiment of the present invention.

FIG. 17 is a schematic view showing the exploded cooling utensil according to the eighth embodiment of the present invention.

FIG. 18 is the cross sectional view of the assembled cooking utensil according to the eighth embodiment of the present invention.

FIG. 19 is a schematic view showing the exploded cooling utensil according to the ninth embodiment of the present invention.

FIG. 20 is the cross sectional view of the assembled cooking utensil according to the ninth embodiment of the present invention.

FIG. 21 is a schematic view showing the exploded cooling utensil according to the tenth embodiment of the present invention.

FIG. 22 is the cross sectional view of the assembled cooking utensil according to the tenth embodiment of the present invention.

FIG. 23 is a schematic view showing the exploded cooling utensil according to the eleventh embodiment of the present invention.

FIG. 24 is the cross sectional view of the assembled cooking utensil according to the eleventh embodiment of the present invention.

FIG. 25 is a schematic view showing the exploded cooling utensil according to the twelfth embodiment of the present invention.

FIG. 26 is the cross sectional view of the assembled cooking utensil according to the twelfth embodiment of the present invention.

FIG. 27 is a schematic view of the exploded cooling utensil according to the thirteenth embodiment of the present invention.

FIG. 28 is a schematic view of the exploded cooling utensil according to the fourteenth embodiment of the present invention.

FIG. 29 is the cross sectional view of the assembled cooking utensil according to the fourteenth embodiment of the present invention.

FIG. 30 is a schematic view of the exploded cooling utensil according to the fifteenth embodiment of the present invention.

FIG. 31 is the cross sectional view of the assembled cooking utensil according to the fifteenth embodiment of the present invention.

FIG. 32 is a schematic view of the exploded cooling utensil according to the sixteenth embodiment of the present invention.

FIG. 33 is the cross sectional view of the assembled cooking utensil according to the sixteenth embodiment of the present invention.

FIG. 34 is a schematic view of the exploded cooling utensil according to the seventeenth embodiment of the present invention.

FIG. 35 is the cross sectional view of the assembled cooking utensil according to the seventeenth embodiment of the present invention.

FIG. 36 is a schematic view of the exploded cooling utensil according to the eighteenth embodiment of the present invention.

FIG. 37 is the schematic view of the assembled cooking utensil according to the eighteenth embodiment of the present invention.

FIG. 38 is an overall outlook of the assembled cooling utensil according to the eighteenth embodiment of the present invention.

FIG. 39 is the cross sectional view of the cooling utensil according to the eighteenth embodiment of the present invention.

FIG. 40 is an outlook of the alternative top plate of the assembled cooking utensil according to the eighteenth embodiment of the present invention.

FIG. 41 is a practical serving on the alternative top plate of the cooling utensil according to the eighteenth embodiment of the present invention.

FIG. 42 is across sectional view of the practical serving on the alternative top plate of the cooling utensil according to the eighteenth embodiment of the present invention.

FIG. 43 is a schematic view of the exploded cooling utensil according to the nineteenth embodiment of the present invention.

FIG. 44 is the schematic view of the assembled cooling utensil according to the nineteenth embodiment of the present invention.
FIG. 45 is an overall outlook of the assembled cooling utensil according to the nineteenth embodiment of the present invention.

BEST MODE FOR CARRYING OUT THE INVENTION

Hereinafter, the various types of the cooling utensils of the present invention will be described in detail accompanying with the drawings.

For the same or similar component, the numeral reference is used identically in the various types of the cooling utensil.

FIG. 1 is a schematic view showing the exploded cooling utensil according to the first embodiment of the present invention. FIG. 2 is the schematic view of an assembled cooling utensil according to the first embodiment of the present invention. FIG. 3 is the cross sectional view of the cooling utensil according to the first embodiment of the present invention. FIG. 4 is a plug bolt of the cooling utensil according to the first embodiment of the present invention.

As seen in FIG. 1 to FIG. 4, the cooling utensil according to the first embodiment of the present invention is comprised of that an upper part (2), a lower part (3), an elastic plate (4), a plug bolt (5), a sealing ring (6) and a fastening bolt (7). The upper part (2) is assembled with the lower part (3) by the fastening bolt (7) forming a water inlet. The upper part (2) has formed a dome shape with series of grooves (23) from top to edge in the radial directions to drain the condensed water being generated due to the temperature difference. Then, the food served on the upper part of the utensil will not allow absorbing the condensed water, thus the food maintains fresh and tasty at the cool temperature. At a summit of the dome shape, a thermometer (24) is attached to display the serving temperature.

Further, a center post (26) having female thread is integrally formed underneath the dome shape of the upper part (2) to thread the fastening bolt (7). A water inlet (33) is connected to a water channel (26a), which is formed at a core of the fastening bolt (7) under the lower part (3).

Due to the dome shape, the center of the upper part (2) is raised to be higher than the circumferential edge. Therefore, it is effectively transferred the chilled temperature to the serving food, it is prefer to put the food directly on the dish with out laying sliced radishes under the food, for example of serving the sliced raw fish dishes.

When a dinner can display the serving temperature for the food, which is required keeping cool, the customer may be emotionally confidential and enjoy the serving food in visual and tastes.

For displaying means of the temperature, a thermometer (24) can be used an analogue, a digital or a thermocolor being varied the color depending on the temperature changes.

The lower part (3) usually forming either a circular or a rectangular shape as same size and same of the upper part (2) to be a supporter or base of the utensil.

For other kind of utensil, the upper part (2), which is declined toward the center, has integrally formed a tube typed post (26) with a female thread to thread the fastening bolt (7). A water inlet (33), which is connected to a water tube, is formed at a core of the fastening bolt (7) under the lower part (3).

The upper part (2) and the lower part (3) of the utensil are made of the anti-rust materials, such as a stainless, aluminum, magnesium-aluminum alloy or clad plate binding two different metals, and non-metal material, such as a glass, ceramic or melamine polyester. Especially, for the metal material, the surface is treated with harmless process, such as a gold plate, silver plate, silver-nano coating, ceramic coating, anodizing.

If the clad plate is used to product, the utensil could be semi-permanently use, because the clad plate is thicker than the metal, which is treated plating or coating.

Further, if the utensil is performed the treatment of the silver-nano coating, it will have anti-biotic effects to kill the germ in the raw fish.

The elastic plate (4) is inserted between the upper part (2) and lower part (3) and tightly sealed another one for providing a cavity (25) to fill the water. A water inlet (33), which is located at the center of lower part (3), is formed through core of the fastening bolt (7). The supporting post (26) located under the center of the upper part (2) is connected to the water channel (26a) for filling the water to the cavity (25). When the water is poured into the water inlet (33), the water flow is passed through the supporting post (26) and water channel (26a) to the cavity (25). At the center of the elastic plate (4), a pair of an annular shaped sealing seat (41) is provided on both sides of the inlet cavity (25). A pair of edge sealing ring (42) is mounted along the circumferential grooves on both sides of the elastic plate (4). As the upper part, lower part, elastic plate (4) and sealing rings are assembled another one, then the fastening bolt (7) is inserted through the supporting post (26) to tightly fasten the final product. The sealing ring (42) and the annular shaped sealing seat (41) are properly mounted to prevent the leakage.

The elastic plate (4) must have a property of elasticity and restoring capability. Therefore, it could be made of rubber to be stable for the coolant or water for a long period of usage. Further, a metal plate forming a bellows shape can be used to have a property of elasticity and restoring capability. The elastic plate (4) could be altered the various shapes to have a property of elasticity and restoring capability.

Because the elastic plate (4) has flexibility and restoring capability, it will properly compensate the expansion or shrink depending on the freezing water or melt the ice. The sealing portions of the cavity (25) will prevent the leakage from the expansion or shrink.

The fastening bolt (7) is integrally combined the upper part (2), the elastic plate (4), and lower part (3). The fastening bolt (7) has a hollow inside to form a female thread for mating to the plug bolt (5). A sealing ring (6) is inserted when the plug bolt (5) is inserted to the fastening bolt (7) for tightly sealing the inlet.

The elastic plate (4) is integrally combined the upper part (2), the elastic plate (4), and lower part (3). When the plug bolt (5) is released to fully fill the water in the cavity (25). Then, the plug bolt (5) is inserted to the fastening bolt (7) for tightly sealing the inlet.

As shown in FIG. 4, the plug bolt (5) is designed to have a function of the safety valve for preventing the explosion when the utensil is unaware heated, such as a fire or mistakenly place it on the oven. If the utensil is over heated, the safety valve in the plug bolt (5) is released the steam in the cavity (25) to reduce the pressure.

The structure of the safety valve in the plug bolt (5) and its assembly procedure is as follows:

As shown in FIG. 4, the outer shape of the fastening bolt (7) has formed a male thread and a bolt head (51). The bolt head (51) has formed an outer hollow core for engaging
to a plug cap bolt (55), and an inner hollow core. The plug cap bolt (55) has also formed the hollow core. An outer sealing seat (54a) is formed at a step of the hollow core of the plug cap bolt (55) to mount an outer sealing ring (57) and an outer valve (54). The diameter of the inner hollow core is smaller than that of the outer hollow core. An inner sealing seat (53a) is formed on a step, which is adjacent to the inner and outer hollow core for mounting an annular sealing ring (58) and an inner valve (53). The inner valve (53) is threaded at a tip of a T-shaped valve rod (52) and the outer valve (54) is formed at the head of the T-shaped valve rod (52). A compression spring (58) is mounted on the stem of the T-shaped valve rod (52) for exerting the tension between the inner valve (53) and the plug cap bolt (55).

0080 Herein, the outer valve (54) of the T-shaped valve rod (52) is not only acting as a safety valve, but also acting as a stopper to prevent invasion of the foreign object for keeping clean.

0081 Such a structure of the plug bolt (5), the inner valve (53) and the outer valve (54) are mounted on the sealing seat (53a) and the outer sealing seat (54a), respectively for exerting the expanding force by the spring (58). The plug bolt (5) is sealed the filled water in the cavity (25) for cooling, but vent out the steam when it is unaware heating by retrieving outward the inner valve (53) and the outer valve (54), at same time to prevent the explosion.

0082 The assembly process of the cooling utensil of the first embodiment of the present invention is as follows:

0083 First, the elastic plate (4) is placed on top of the lower part (3) and sealed with the sealing parts. The upper part (2) is overlapped on the assembled lower part (3) and sealed with the sealing parts. The fastening bolt (7) is inserted into the water inlet (33) to fasten the pre assembled the elastic plate (4), lower part (3) and upper part (2). Thus, the cavity is formed between the elastic plate (4) and the upper part (2) to fill the water. However, an air pocket (31) is formed between the elastic plate (4) and the lower part (3). When the water is filled, the water flows through the fastening bolt (7) to the cavity. As the plug bolt (5) and the sealing ring (6) are inserted to the fastening bolt (7) and fastening it. Through the process, the cooling utensil (1) is completed the assembly for ready to freeze in the freezer.

0084 The air pocket (31), which is located between the elastic plate (4) and the lower part (3), is acting as an insulation to prevent the condensed water under the lower surface of the utensil while the elastic plate (4) is expanding or shrinking depending on the water in the cavity is freezing or melting. Because the present cooling utensil is not required a separate insulation, the structure will be simple and save the insulating cost.

0085 Further, the water, non-toxic coolant or mixture of the water and coolant is used to fill in the cavity (25) of the cooling utensil to prolong the cooling time.

0086 As discussed above configuration, the function of each component in the cooling utensil (1) of the first embodiment is described in detail as follows:

0087 (78) When the water is fully filled in the cavity (25) of the cooling utensil (1) and freeze in the freezer, the elastic plate (4) will be expanded as expanding the volume of freezing ice. Therefore, the expansion of the elastic plate (4) prevents a crack or distortion of the utensil. When the freeze utensil is used in the room temperature, the ice in the cavity (25) is melted. When the ice starts melting, the elastic plate (4) is exerted restoring force to shrink the cavity as shranken the volume of the ice. Because the cavity (25) is fully filled the water, there is no air pocket inside. When the water in the cavity (25) is completely freezing, there is only ice exist. During the utensil used in the room temperature, the cavity (25) is filled with the mixture of ice and water without air. Therefore, the water in the utensil won’t be fluctuated during the serving. Because the ice floats on the melted water in the cavity (25) to contact the upper part of the utensil, the serving food on the upper part of the utensil is always kept cooling. Therefore, the present utensil is favorable to use for the customer.

0088 Further, the cooling utensil is provided a thermometer (24), so that it gives feeling of visual cooling to stimulate the appetizer and confidence for the serving food fresh and tasty.

0089 The cooling utensil (1) of the present invention is also maintained the cooling condition for the serving food fresh and tasty during the user eating the serving food.

0090 Due to the safety function valve of the plug bolt (5), it guarantees a safety and security to the customer and the surrounding persons for preventing the explosion when the utensil is unaware heated.

0091 The cooling utensil (1) of the present invention is built through the assembly of the components without welding process. So that, it has advantages to easy manufacturing with lowering the product cost.

0092 FIG. 5 is a schematic view showing the exploded cooling utensil according to the second embodiment of the present invention. FIG. 6 is the cross sectional view of the cooling utensil according to the second embodiment of the present invention.

0093 As seen in FIG. 5 to FIG. 6, the cooling utensil according to the second embodiment of the present invention comprises that: an upper part (2a), a lower part (3a) and an elastic plate (4a). A set of springs (8) is mounted between the elastic plate (4a) and a lower part (3a) for supporting the upper part (2a). A fastening bolt (7a) and a sealing ring (6a) is used to assemble the upper part (2a), the lower part (3a) and the elastic plate (4a) to be a final product.

0094 The basic configuration of the upper part (2a), lower part (3a) and the elastic plate (4a) are same as that of the first embodiment of the present invention, except the shape.

0095 The upper part (2a) forms a rectangular-shaped plate having a plurality of the square sections, which is divided by a series of ordinate and abscissa grooves (23) for draining the condensed water. A set of supporting post (26) is integrally installed under the upper part (2a) at four corners. The center of the supporting post (26) forms a water channel (26a) in the perpendicular direction. The lower part (3a) forming a rectangular-shaped topless box has four water inlets (33) at four corners to match with the supporting post (26) of the upper part (2a). The elastic plate (4a) is also forming a rectangular-shaped topless box, which is slightly smaller and shallower than the lower part (3a) for fitting. The four fastening bolts (7a) are thoroughly installed at four corners of the elastic plate (4a). The elastic plate (4a) is made of the rubber or plastic which has a restoring force. A pair of springs (8) is mounted on the mounting seats between the elastic plate (4a) and the lower part (3a) for assisting the restoring force when the elastic plate (4a) is exerted recovering force because of the volume shrinking while the ice is melting. Thus, the upper part can keep contacting to the ice for a long period. The elastic plate (4a) has formed the grooves...
around the periphery on both sides for mounting the sealing (42). Thus, the cooling cavity (25) is sealed for filling the water.

[0096] A sealing ring (5a) is inserted in the fastening bolts (7a) when sealing the cooling cavity (25). The four fastening bolts (7a) are used to assemble the elastic plate (4a), the lower part (3a) and the upper part (2a) to be a body. One of four fastening bolts (7a) has a safety function as same structure of the first embodiment of the present invention.

[0097] FIG. 7 is a schematic view showing the exploded cooling utensil according to the third embodiment of the present invention. FIG. 8 is the cross sectional view of the cooling utensil according to the third embodiment of the present invention.

[0098] The cooling utensil (1b) according to the third embodiment of the present invention comprises: an upper part (2b), a lower part (3b) and an elastic plate (4b). The upper part (2b) further comprises an upper frame (29), a frame sealing ring (27) and a cooling plate (21). A set of fastening bolts (7b) and sealing rings (6b) are used to assemble the upper part (2b), lower part (3b) and the elastic plate (4b). The overall shape of the upper part (2b), lower part (3b) and the elastic plate (4b) of the third embodiment of the present invention is similar with that of the second embodiment of the present invention, except the frames and few other items. However, the basic functions and concept are same as the second embodiment.

[0099] The upper part (2b) forming a dome shaped plate for serving the food further comprises a cooling plate (21) and an annular frame (29) to fixing the cooling plate (21).

[0100] A frame sealing ring (27) is placed between the two parts of the cooling plate (21) and annular frame (29). Then, a set of fixing brackets (28a) and fixing bolts (28) are inserted to assemble the cooling plate (21) and the annular frame (29) to be one body.

[0101] The reason why the upper part (2b) is assembled with two pieces is that it is possible to design the cooling plate (21) in various shapes and produce using the various materials. The natural materials, such as a jade or marble are very hard to forming the desired shapes. The materials, such as a glass or ceramic are so fragile and hard to handle. However, the cooling plate (21), which is made of the expansive and high quality of material, can be easily handled, if the cooling plate (21) is combined with the metal frame.

[0102] Such the cooling plate (21), which can be used for a semi-permanent, forms a series of grooves (23) to drain the condensed water. The annular frame (29), which looks like an up side down hat, has a cylindrical lateral wall with opened center and the rim is slightly and outwardly inclined. A set of built-in brackets (26) are attached inside of the cylindrical lateral wall at four places to form a water inlet (26a). The elastic plate (4b) is also forming a cylindrical-shaped basin with a flexible bottom having elastically restoring capability, such as a rubber. The annular frame (29) has a plurality of thread holes for installing the fixing bolts, a plurality of mounting holes for passing through the fastening bolts (7b) and a pair of sealing grooves (42) on both sides for sealing the water cavity (25).

[0103] The lower part (3b) forming a cylindrical-shaped container without top, has a plurality of mounting holes for passing through the fastening bolts (7b) to match with the mounting holes of the annular frame (29) for passing through the fastening bolt (7b).

[0104] The assembly of the upper part (2b), the lower part (3b) and the cooling plate (21) is combined by the fastening bolts (7b). At least one of four fastening bolts (7a) has a safety function as same structure of the first embodiment of the present invention.

[0105] FIG. 9 is a schematic view showing the exploded cooling utensil according to the fourth embodiment of the present invention. FIG. 10 is the cross sectional view of the assembled cooling utensil according to the fourth embodiment of the present invention.

[0106] The cooling utensil (1c) according to the fourth embodiment of the present invention comprises: an upper part (2c), a lower part (3c) and an elastic plate (4c). The lower part (3c), which is for supporting the elastic plate (4c), is used as a base for supporting the utensil.

[0107] The upper part (2c), which is for serving foods, forms a hemispherical shape at the center. A cavity is formed under the upper part (2c) for filling the water. An annular frame (29) having a hat-shape is slightly inclined outward for fixing the cooling plate (21). The upper part (2c) forms a cylindrical-shaped container with downward opening having a mail thread (21a) on outer wall. The lower part forms a cylindrical-shaped container without a top and having a female thread (35) on the inner wall for mating to the mail thread (21a) of the upper part. An elastic plate (4c) forming a disk-shape and annular sealing ring (42) are installed to fit under a rim of the mail thread (21a) of the upper part (2c).

[0108] The upper part (2c) could be made of the various materials, for example, metal plates, such as an aluminum, magnesium, stainless steel, clad plate, etc., non-metals, such as a ceramic, resin, glass, jade stone, etc. The upper part (2c) could be performing the surface treatment for coating, painting, and plating to provide an image of high quality.

[0109] The elastic plate (4c) forming a disk shape with convex center, has a same diameter of the mail thread (21a) of the upper part (2c). Under the elastic plate (4c), an air pocket (31) is formed for expansion and shrink. A pair of springs (8) is fitted on the mounting seats formed on the lower part (3c) for assisting the restoring force of the elastic plate (4c). The elastic plate (4c) is made of the rubber material having flexibility and restoring capability. An L-shaped annular sealing ring (42) is mounted into the circumferential grooves formed on both sides of the upper part (2c) to seal between the cavity (25) and the upper part (2c).

[0110] The lower part (3c) forming a cylindrical-shaped basin with closed bottom has a female thread on inner surface to match with the male thread (21a) of the upper part (2c). The elastic plate (4c) is mounted under the upper part (2c) to form a cavity (25) for filling water. The upper part (2c), lower part (3c) and the elastic plate (4c) are assemble together to be a body of the cooling utensil (1c).

[0111] If the upper part (2c) is used a strong material and the bottom of the lower part (3c) is used the flexible material, the elastic plate (4c) may not employed. Thus, the bottom of the lower part (3c) can be expand or shrinken during the water is freezing or ice is melting.

[0112] As discussed the components so far, the combining process of the components in the cooling utensil according to the fourth embodiment is described in detail as follows:

[0113] First, the upper part (2c) is turned over and placed the elastic plate (4c). Next, the lower part (3c) places over the elastic plate (4c) and tighten the fixing bolt and fastening bolt to complete the assembly.
Such a cooling utensil (1c) is placed in the freezer for freezing the water filled in the cavity (25). As the water freeze, the elastic plate (4c) would be expanded outward. Thus, it will prevent the freezing-crack or distortion of the cooling utensil (1c).

Further, the food served on the upper part (2c) of the cooling utensil (1c) will always contact with the ice during the serving. Because the melted water sink down to float the ice and the cavity (25) will be pushed up by the elastic plate (4c) when the volume is decreased for the ice melting. At the beginning, the water is fully filled. So that, there is no air exist in the cavity (25). There is only mixture of water and ice exists in the cavity (25) during the serving time. Therefore, cooling utensil (1c) will effectively cooling the served food on it.

FIG. 11 is a schematic view showing the exploded cooling utensil according to the fifth embodiment of the present invention. And FIG. 12 is the cross sectional view of the assembled cooling utensil according to the fifth embodiment of the present invention.

The cooling utensil (1d) according to the fifth embodiment of the present invention comprises that: an upper part (2d) forming a cup for beer, an elastic plate (4d) and a lower part (3d) forming a base.

The upper part (2d), which is forming a dual cup for beer, is made of transparent glass. The cavity (25) is formed between the dual walls for filling the water or coolant. The elastic insulating layer (12) is attached to the inside of the outer wall to assist the elastic plate (4d) action and preventing the condensed water on the outer wall of the cup. The lower part (3d) has formed a female thread (35) for mating to the male thread (21a) formed outside of the upper part (2d).

Instead of the dual cup, the cavity (25) is formed only at the bottom portion of the cup, to save the production cost. The elastic plate (4d) forms a hat-shaped basin with an opened bottom and a spring mounting seat at the center for mounting a spring (8), which is assisted to prevent deflection of the elastic plate (4d). An annular sealing ring (42) is installed between the annular frame of the elastic plate (4d) and the bottom of the upper part (2d) to seal the cavity (25). An air pocket is formed between the lower part (3d) and the elastic plate (4d) to allow expanding and shrinking of the elastic plate (4d). The elastic plate (4d) is made of a flexible material.

The lower part (3d), which could be made of transparent glass, forms a cylindrical-shaped shallow basin with topless and a female thread (35) is formed inner lateral wall to mate with the male thread (21a) of the upper part (2d) to fix the elastic plate (4d). Therefore, the cavity (25) formed between the elastic plate (4d) and the upper part (2d) is sealed. At this point, the upper part (2d), the elastic plate (4d) and the lower part (3d) are combined to be a body.

FIG. 13 is a schematic view showing the exploded cooling utensil according to the sixth embodiment of the present invention. FIG. 14 is the cross sectional view of the assembled cooling utensil according to the sixth embodiment of the present invention.

The cooling utensil (1e) according to the sixth embodiment of the present invention comprises that: an upper part (2e), an elastic plate (4e) and a lower part (3e) forming a base.

The upper part (2e), which is intended to use a food container, forms a circular basin being divided into two half circular compartments. The cavity (25) is formed between the dual walls for filling the water or coolant. The elastic insulating layer (12) is attached to the inside of the outer wall to assist the elastic plate (4e) action and preventing the condensed water on the outer wall. The lower part (3e) has formed a female thread (35) for mating to the male thread (21a) formed outside of the upper part (2e).

Because the food container has divided into two half circular compartments, it is possible to store the two different foods at the same time.

The configuration of the elastic plate (4e) and the lower part (3e) are same that of the fifth embodiment of the present invention. A spring (8) is mounted on the spring mounting seat located at the center for assisting and preventing the deflection of the elastic plate (4e).

FIG. 15 is a schematic view showing the exploded cooling utensil according to the seventh embodiment of the present invention. FIG. 16 is the cross sectional view of the assembled cooling utensil according to the seventh embodiment of the present invention.

The cooling utensil (1f) according to the seventh embodiment of the present invention comprises that: an upper part (2f), an elastic plate (4f), a lower part (3f) forming a base and a lid (9f).

The upper part (2f) being intended to use a food container, forms a cylindrical dual basin. The cavity (25) is formed between the inner and outer walls for filling the water or coolant. The elastic insulating layer (12) is attached to the inside of the outer wall to assist the elastic plate (4f) action and preventing the condensed water on the outer wall. The upper circumferential portion of the upper part (2f) forms a male thread (21b) to close a lid. The lower part (3e) has formed a female thread (35) for mating to the male thread (21a) formed lower circumferential portion of outside of the upper part (2f). The male thread (21b) may be used the double or triple pitched for rapid open and close the lid.

The configuration of the elastic plate (4f) and the lower part (3f) are same that of the fifth embodiment of the present invention. A spring (8) is mounted on the spring mounting seat located at the center of the lower part (3f) for assisting and preventing the deflection of the elastic plate (4f).

The lid (9f) having a circular shape forms a female thread (91) to match with the male thread (21b) on the upper circumferential of the upper part (2f). Therefore, it is possible to keep the food for a long time.

The cavity (25) formed between the elastic plate (4f) and the upper part (2d) is filled the water or coolant. Because the container closed by the lid (9f), the food in the container can be stored longer time. At this point, the upper part (2d), the elastic plate (4d) and the lower part (3d) are combined to be a body.

If the air is shrunken in the closed container, it will be a negative pressure. Thus, it is hard to open the container lid. Therefore, the lid (9f) has an air vent to easily open when the air volume is shrunken.

FIG. 17 is a schematic view showing the exploded cooling utensil according to the eighth embodiment of the present invention. FIG. 18 is the cross sectional view of the assembled cooling utensil according to the eighth embodiment of the present invention.

The cooling utensil (1g) according to the eighth embodiment of the present invention comprises that: an upper part (2g), an elastic plate (4g), a lower part (3g) forming a base and a lid (9g).

The configuration of the upper part (2g) is same that of the seventh embodiment of the present invention. Only the
The difference is that the inner diameter of the lid (9f) is same as the outer diameter of the upper part (2f). The upper circumferential portion of the upper part (2f) forms a male thread (21b) to close a lid (9g). The male thread (21b) may be used the double or triple pitched for rapid open and close the lid (9g).

[0136] FIG. 19 is a schematic view showing the exploded cooling utensil according to the ninth embodiment of the present invention. FIG. 20 is the cross sectional view of the assembled cooling utensil according to the ninth embodiment of the present invention.

[0137] The cooling utensil (1h) according to the ninth embodiment of the present invention comprises that: an upper part (2h), an elastic plate (4h), a lower part (3h) forming a base and a lid (9h).

[0138] The configuration of the upper part (2h) is same that of the seventh embodiment of the present invention. Only the difference is that the lid (9h) has an annular flange (21c) with a sealing ring (9l). The outer diameter of annular flange (21c) is same as the inner diameter of the upper part (2h). The sealing ring (9l) of the lid (9h) is tightly contact the inner wall of the upper part (2h) to seal the container.

[0139] The head (94) of the lid (9h) is larger than the annular flange (21c), so that the lid (9h) is slightly protruded out of the upper part (2h) for easily grasping to open the lid.

[0140] The cooling utensil (1h) of the ninth embodiment of the present invention is that the lid (9h) is depressed into or pulling out from the upper part (2h) for closing or opening.

[0141] FIG. 21 is a schematic view showing the exploded cooling utensil according to the tenth embodiment of the present invention. FIG. 22 is the cross sectional view of the assembled cooling utensil according to the tenth embodiment of the present invention.

[0142] The cooling utensil (1i) according to the tenth embodiment of the present invention comprises that: an upper part (2i), an elastic plate (4i), a lower part (3i) forming a base and a plug bolt (5i) having safety function.

[0143] The upper part (2i) is formed a large sized deep bowl to contain a large amount of food, such as a cold noodle.

[0144] It is not shown in figure, but a thermometer can be attached on the cooling bowl to visual check the feeling condition.

[0145] The upper part (2i) is combined to the elastic plate (4i) to form a cavity (25) for filling the water. A fastening bolt (36) with the plug bolt (5i) is installed at the center of the lower part (3i). The elastic part (4i) having flexibility and restoring capability is attached inner surface of the lower part (3i), so that it prevents penetrating of the water. Because the lower part (3i) is attached insulating material, the outer surface of the utensil will not be condensed the moisture during the serving food, and prevent the losing cool condition for prolong the serving time.

[0146] The cavity (25) contains the mixture of ice and water without air, because the cavity (25) is fully filled the water at the beginning. Further, the cavity (25) will push up by the elastic part (4i) as decreasing the volume during the ice is melting. Therefore, the ice floats on the melted water, the ice will always contact the bottom of the upper part. Accordingly, the serving food on the upper part of the utensil is always kept cooling. The water in the utensil won't be fluctuated during the serving.

[0147] Herein, the elastic part (4i) could be made of material having flexibility and restoring force, such as a rubber, plastic or resin.

[0148] The inner surface of the lower part (3i) is treated to be rough for easily attaching the insulating materials.

[0149] The plug bolt (5i) forms a hollow channel at center with no hex head. The hollow channel has a step, which is a conjunction of inner and outer, two different diameters. A sealing seat (53h) is formed on the step for mounting an annular sealing ring (56a) and a T-shaped valve (53c). At a tip of the T-shaped valve (53c), a pin hole is formed for installing a split pin (59a). The annular sealing ring (56a) and the T-shaped valve (53c) are inserted to the hollow channel, then; install a spring (56a), a washer (59) and a split pin (59a) to assemble a safety valve.

[0150] The T-shaped valve (53c) forming a round head is not protruded out from the bottom of the lower part (3i) to be a smooth bottom surface.

[0151] The assembling method of the cooling utensil according to the tenth embodiment of the present invention is as follow:

[0152] First, the inner surface of the lower part (3i) is treated to be rough for easily attaching the insulating materials. The elastic part (4i) is made of the insulating material, which has flexibility and restoring capability. The elastic part (4i) is attached inner surface of the lower part (3i), so that it prevents penetrating of the water. Next, place the upper part (2i) over the insulating material attached lower part (3i) for welding, argon arc welding or binding depending on the parts materials. Finally, the cavity (25) is fully filled the water through the water inlet, which is formed at the center hollow of the fastening bolt (36), and the fastening bolt (36) and the plug bolt (5i) installed under the lower part (3i) are tightly fastened to complete the assembly.

[0153] The usage of the cooling utensil according to the tenth embodiment of the present invention is as follow: when the cooling utensil is placed in a freezer, the fully filled water in the cavity (25) freeze to the ice. Then the elastic part (4i) will be swollen out due to the expansion of the volume. If the elastic part (4i) is not employed, the upper part (2i) would be got damaged due to the expansion of the volume. As a result, the upper part (2i) is protected from the volume expansion.

[0154] Reversely, when the freeze utensil (1i) is used in the room temperature, the ice in the cavity (25) starts to melt. The elastic part (4i) is restoring to push up the shrunken cavity as the ice progress melting. Therefore, there is only mixture of the ice and melted water in the cavity (25) with out air. Because the ice floats on the melted water to contact the bottom of the upper part (2i), it is effectively cooling the serving food.

[0155] FIG. 23 is a schematic view showing the exploded cooling utensil according to the eleventh embodiment of the present invention. FIG. 24 is the cross sectional view of the assembled cooling utensil according to the eleventh embodiment of the present invention.

[0156] The cooling utensil (1j) according to the eleventh embodiment of the present invention comprises an upper part (2j), a bellows-type handle (10), a lower part (3j) forming a base and a sealing cap (11).

[0157] The upper part (2j) has formed a convex-shaped top with series of grooves (23) from top to edge in the radial directions to drain the condensed water, so that the food served on the utensil will not absorbed the condensed water. Thus the food maintains fresh and tasty at the cool temperature.
A expansion circular flange (20) forming double thin layers with a hollow between the layers is formed at a junction of the upper part (2j) and the lower part (3j) for absorbing the expansion or shrinking to prevent the distortion of the upper and lower parts.

The lower part (3j) working as a base, has horizontally attached a bellows-type handle (10) at one side for activating expansion or shrink according to the expanding or shrinking due to the freezing or melting of the ice, so that it prevents the distortion of the upper part and the lower part.

The bellows-type handle (10) and the water inlet (33) are installed at the convenient location based on the structural design.

The sealing cap (11) forming a female thread mates with the male thread on the tip of the bellows-type handle (10) for sealing the cavity (25).

It is not shown in figures that the upper part of the utensil has provided a cover for maintaining the cooling for a long time. It is also convenient to carry, when the cover is locked to the upper part.

The producing process and effect of the cooling utensil of the eleventh embodiment of the present invention is as follows:

The cooling utensil configured with the upper part (2j), lower part (3j) and the bellows-type handle (10) without the elastic part, adopts the material having flexibility. For example, if the material, such a raisin, especially, Polyethylene Terephthalate (PET) is used to product by the blow molding, it is possible to mass production with low cost.

Therefore, the present cooling utensil can be used for displaying the food at the food store, or carrying the raw fish to the outdoor picnic. Further, the melted water in the cooling cavity (25) of the utensil (1j) can be used as a drinking water, at the outdoor.

Further, the cooling utensil (1j) according to the eleventh embodiment of the present invention, the cavity (25) formed between the upper part (2j) and the lower part (3j) is filled with water or coolant. Then, the water inlet is closed with the sealing cap (11) for freezing in the freezer. While the water is freezing or melting, the expansion-shrink absorber, such as the bellows-type handle (10) and the expansion circular flange (20) is compensated to keep out the damage to the utensil.

As discussed so far, the cooling utensil (1j) of the eleventh embodiment of the present invention, it has designed the special parts to adopt the special property of materials, such as the flexibility or restoring capability depending on the freezing or melting of the ice to keep the original shape.

FIG. 25 is a schematic view showing the exploded cooling utensil according to the twelfth embodiment of the present invention. FIG. 26 is the cross sectional view of the assembled cooling utensil according to the twelfth embodiment of the present invention.

The cooling utensil (1k) according to the twelfth embodiment of the present invention comprises an upper part (2k), a lower part (3k), an elastic tube (4k) and a sea ling plug bolt (33).

The upper part (2k) has a rectangular-shaped plate forming a plurality of pyramid shaped protrusions (22) for draining the condensed water, so that the food keep out of absorbing moistures. The lower part (3k) forms a rectangular-shaped box without a top for using as a base. A cavity (25) is formed between the upper part (2k) and the lower part (3k) for filling the water. The elastic tube (4k) is inserted into the cavity (25). The lower part (3k) has built a dual wall to form a vacuum gap between the inner wall and the outer wall for insulation, so that the outer wall has no condensed water gained.

The lower part (3k) has a circular opening at one lateral wall to form a water inlet (33). The water inlet (33) has formed a stepped portion (33a), which has reduced inner diameter at inner portion. The water inlet (33) has formed a female thread for inserting the plug bolt (5k). The shape of the water inlet (33) is varied depending on the materials and designs of the cooling utensil.

The elastic tube (4k) made of the material having flexibility, restoring capability and water proof, comprises an inlet busing with opened mouth, a long tube body and a sealing ring (43). The water inlet (33) has formed a bushing (33a) and the plug bolt (5k) mounted at the center for sealing the water filled cavity.

Further, the elastic tube (4k) made of the elastic material will be expanded when the water is freeze in the freezer to prevent the possible damages due to the volume expansion, and installed the sealing ring (43) to prevent a leaking from the cavity (25). The water inlet (33) is sealed by fastening the plug bolt (5k).

Further, the air filled elastic tube (4k), which is independent from the lower part (3k), is inserted into the cavity; the elastic tube (4k) will be floated arbitrary position depending on setting location of the cooling utensil. In some case, if the cooling utensil is freeze when the air filled elastic tube (4k) is touched the bottom of the upper part (2k), the elastic tube (4k) blocks out the cooling transfer. If the elastic tube (4k) is shifted to one side, the cooling utensil may get crack while the water is freezing, because the elastic tube (4k) can not absorb the volume expansion of the other side.

The plug bolt (5k) forming a male thread with headless is used to plug the water inlet to seal the cavity (25).

It is not seen in the figure, but it is possible to mount a safety valve on the upper part (2k) or lower part (3k). Further, a thermometer can be attached on the upper part to feel visual cooling to stimulate the appetite.

The producing process of the cooling utensil of the twelfth embodiment of the present invention is as follows:

The upper part (2k) and the lower part (3k) are combined together by binding means, such as a welding or adhering to form a cavity (32) between them. The water or coolant is fully filled through the water inlet (33). The elastic tube (4k) is inserted into the cavity (25); next the plug bolt (5k) is fastened to complete the cooling utensil (1k).

The effective operation of the cooling utensil of the twelfth embodiment of the present invention is as follows: The cooling cavity (32) is formed between the upper part (2k) and the lower part (3k) to fully fill the water or coolant through the water inlet (33). The elastic tube (4k) is inserted into the cavity (25); next the plug bolt (5k) is fastened to complete the cooling utensil (1k). The structure is simply designed to easy assembly, thus, the production cost is low.
FIG. 27 is a schematic view of the exploded cooling utensil according to the thirteenth embodiment of the present invention.

The cooling utensil (141) according to the thirteenth embodiment of the present invention comprises an upper part (241), a lower part (341), an elastic tube (441) and a plug nut (541) for closing the water inlet (33).

The basic configuration of the cooling utensil (141) of the thirteenth embodiment is same as the twelfth embodiment of the present invention excepting the shape.

The upper part (241) used for serving food, forms a circular plate with a plurality of grooves (23) in radial direction for draining the condensed water to keep off the food wet. The lower part (341) supporting the upper part (241) forms a cooling cavity (25) for inserting the elastic tube (441). The elastic tube (441) is inserted through a circular opening formed at one lateral wall of the lower part (341). The cooling cavity (25) is filled water through the water inlet (33). The plug nut (541) is mounted on the male thread of the water inlet (33). The material of the elastic tube (441) has flexibility, elastic restoring force and water proof. The elastic tube (441) forming a long tube type has a mouth busing for mounting a sealing ring (43). Then, the assembly of the elastic tube (441) is mounted at the mouth of the water inlet (33). As the plug nut (541) is tightly fastened on the water inlet (33), the cavity is sealed. The plug nut (541) forming a female thread mates to the water inlet (33) to depress the sealing ring (43) sealing the cooling cavity (25) to prevent leaking.

FIG. 28 is a schematic view of the exploded cooling utensil according to the fourteenth embodiment of the present invention. FIG. 29 is the cross sectional view of the assembled cooling utensil according to the fourteenth embodiment of the present invention.

The cooling utensil according to the fourteenth embodiment of the present invention comprises a cooling bowl (1m) including an upper part (2m), a lower part (3m), an elastic tube (4m) and a plug bolt (5m) for blocking the water inlet (33) on the base and a cooling bowl cover (9) including an upper part (2n), a lower part (3n), an elastic tube (4n) and a plug bolt (5n) for blocking the water inlet (33) forming a knob (5n) on the top.

The upper part (2m) of the cooling bowl forms a shallow dish for containing the serving food. The upper part (2n) of the cooling bowl cover (9) forms a shallow dish for protecting and reflecting the chill to the serving food.

The lower part (3m) of the cooling bowl forms a deep bowl shape for providing the cooling cavity (25) and installing the elastic tube (4m). The lower part (3n) working as a base of the cooling bowl has dual walls to form a vacuum (32) between the inner and outer walls for insulating effect. Thus, it will not gather the condensed water.

The water inlet (33) has a bushing type entrance. The inner channel of the busing has a female thread at front portion to mount a plug bolt (5m), and a step (33a) at rear portion, which the inner diameter is stepped down.

The elastic tube (4m) forming a mushroom shaped tube is made of the material having the property of flexibility, elastically restoring force, and water proof. The inner busing tube of the water inlet (33) has formed the step (33a) for installing the sealing ring (43) and the plug bolt (5m) for sealing the tube.

It is not seen in the drawing, but, it is possible to install a spring inside the elastic tube (4m) for assisting the elastically restoring force when the volume is decreased according to the ice melting. Thus, the ice always contacts the bottom of the upper part to keep cooling for a long time. The plug bolt (5n) forming a male thread is a head less bolt to mount the inner mouth of the water inlet (33) to seal the cooling cavity (25).

On the other hand, the plug bolt (5n) of the bowl cover (9) forming a male thread has a knob for handling and mounting to the inner mouth of the water inlet (33) to seal the cooling cavity (25).

It is not shown in figure, but it is possible to install a latch around the rim of the cooling bowl (1m) and the bowl cover (9) to lock. So, it is convenient to carry when the cover is locked by the latch on the bowl. The safety valve could be mounted on the cooling bowl (1m) or the bowl cover (9). Further, a thermometer could be attached to feel visual cooling to stimulate the appetite.

The cooling bowl (1m) according to the fourteenth embodiment of the present invention is included the cooling bowl cover (9) for keeping the serving food cool for a long time.

FIG. 30 is a schematic view of the exploded cooling utensil according to the fifteenth embodiment of the present invention. FIG. 31 is the cross sectional view of the assembled cooling utensil according to the fifteenth embodiment of the present invention.

The cooling bowl (1n) according to the fifteenth embodiment of the present invention comprises an upper part (2n), a lower part (3n), an elastic tube (4n) and a cap nut (5n). The inner space of the elastic tube (4n), a spring (8) is installed. The cap nut (5n) is used to close the water inlet (33) on the bottom of a cooling bowl.

The upper part (2n) of the cooling bowl (1n) forms a hemispherical-shaped top plate with a summit at the center and a plurality of half marble-shaped protrusions on the top plate for draining the condensed water to avoid the food getting wet.

The lower part (3n) forms an inner circular shape and a step-down outer annular shape has a flanged circular opening at the center to form a water inlet (33). The outer surface of the flange forms a male thread for mating a cap nut (5n).

The upper part (2n) and the lower part (3n) are made of the metal materials, such as a stainless, aluminum, magnesium-aluminum alloy or clad plate binding two different metals, and non-metal materials, such as a glass, china, ceramic, jade stone or melamine polyester. Especially, the metal materials or raisin are perform the surface treatment, such as a plating, silver-nano coating, ceramic coating, anodizing, for providing an elegant image of high quality. Further, it is known that the silver-nano coated utensil have anti-biotic effects to kill the germ in the raw fish.

The elastic tube (4n) forming a mushroom shaped tube is made of the material having the property of flexibility, elastically restoring force, and water proof. The inner busing tube of the water inlet (33) has formed the step (33a) for installing the sealing ring (43) and the cap bolt (5m) for sealing the tube. At the summit of the mushroom shaped tube, the cooling cavity is formed between the upper part having the hemispherical shape and the elastic tube (4n) having the mushroom shape for filling the water. The elastic tube (4n) has enough expandable surface for absorbing the expanding and shrinking of the volume changes according to
the expanding and shrinking during the freezing and melting, so that it is effectively preventing the damage or distortion of the utensil.

[0202] The water inlet (33) has a circular opening to install a busying-type tube for mounting the elastic tube (4n). The busying-type tube has the step (33a) its inner core for installing the sealing ring (43) and the cap bolt (5n) for sealing the cooling cavity.

[0203] Herein, the elastic tube (4n) can vary its shape and size to form a flower or other decorative characters. Then, it will be placed inside of the cooling cavity (35). If the upper bowl (2c) is made of transparent glass, the user can see the decorative shape of the elastic tube (4n) inside of the bowl while serving the food. Therefore, it has an effect to feel the serving food fresh and tasty, and stimulate the appetite.

[0204] The spring (8) is installed inside of the elastic tube (4n) for assisting the elastically restoring force when the volume is decreased due to the melting of the ice. Thus, the ice is kept contacting the bottom of the upper part for a long time.

[0205] The cap nut (5n) is used to close the water inlet (33) of the lower part (3n). The cap nut (5n) is made of either a soft material, such as a plastic or a hard material, such as a glass or ceramic. However, the cap nut (5n) must be made of the same material of the lower part (3n) to prevent loosening the cap nut (5n) by itself due to the poor frictional forces between the engaged threads.

[0206] It is not shown in figure, but it is possible to install a safety valve on the upper part or lower part of the cooling bowl. Further, a thermometer can be attached to show the cooling temperature to feel the fresh and stimulate the appetite.

[0207] The cooling bowl (1k) according to the fifteenth embodiment of the present invention is formed a large-sized dish-type plate for serving the raw fish.

[0208] If a cooling bowl (1n) can be overlapped on the regular dish plate, it is possible to select various dishes without laying the sliced radish under the food.

[0209] FIG. 32 is a schematic view of the exploded cooling utensil according to the sixteenth embodiment of the present invention. FIG. 33 is the cross sectional view of the assembled cooling utensil according to the sixteenth embodiment of the present invention.

[0210] The cooling bowl (1p) according to the sixteenth embodiment of the present invention comprises an upper part (2p), a lower part (3p), an elastic tube (4p) and a plug bolt (5n) for blocking the water inlet (33) on the bottom of a cooling bowl.

[0211] The upper part (2p) of the cooling bowl (1p) forms a hemispherical-shaped top plate with a center summit and a plurality of grooves (23) formed in the radial direction from the summit to the circumferential edge on the top plate for draining the condensed water to avoid the food getting wet.

[0212] The lower part (3p) forming a disk-shaped plate has an inwardly flanged circular opening at the center to form a water inlet (33). The flanged circular opening has a stopper at its inner end. The inner surface of the flanged circular opening forms a female thread for mounting a plug bolt (5p).

[0213] The elastic tube (4p) having property of the flexibility, elastically restoring force, and water proof forms a mushroom shape with a closed-top tap protrusion. The water inlet (33) has formed an inwardly bent flanged opening on the bottom of the lower part for mounting the plug bolt (5n). A stopper is formed inside of the bent flanged opening for installing the sealing ring (43) for sealing the tube.

[0214] Further, the elastic tube (4p) may have various shapes or patterns of decoration to feel diversion.

[0215] The elastic tube (4p) has an air filler having a press pin shaped soft valve (44) with a tiny needle hole at center and a clamp ring (45) for clamping the neck of the soft valve (44). The soft valve (44) is protruded inwardly for supplying air into the tube. The body of the elastic tube (4p) is squeezed to push into the cooling cavity (25) through the water inlet (33). Then the air is injected into the elastic tube (4p) through the need hole of the soft valve (44) for fully inflating the tube to has the elastically restoring force.

[0216] Such a configured elastic tube (4p) is made of the robber. The upper portion and the lower portion of the elastic tube are separate produced. The two pieces are glued together to be a body. The adequate amount of air is injected to fully inflate the elastic tube through the needle valve hole for providing elastically restoring force. Then, the clamp ring (45) is set around the neck of the soft valve (44) for clamping to seal.

[0217] Alternatively, a check valve having an anti-reverse flow can be adopted to fill the air.

[0218] Another kind of the soft tube, which is made of the elastic robber without a predrilled needle hole, could be used to prick the needle into the soft valve for injecting the air. After fully inflating the tube, then glue the needle hole to be permanently sealed.

[0219] The plug bolt (5p) is formed a male thread for mounting to the water inlet (33) at the same time, to seal the air leaking from the tube.

[0220] It is not shown in figure, but it is possible to install a safety valve on the upper part or lower part of the cooling bowl. Further, a thermometer can be attached to show the cooling temperature to feel the fresh and stimulate the appetite.

[0221] FIG. 34 is a schematic view of the exploded cooling utensil according to the seventeenth embodiment of the present invention. FIG. 35 is the cross sectional view of the assembled cooling utensil according to the seventeenth embodiment of the present invention.

[0222] The cooling bowl (1q) according to the seventeenth embodiment of the present invention comprises an upper part (2q), a lower part (3q), an elastic tube (4q) and a plug bolt (5q) for blocking the water inlet (33) on the bottom of a cooling bowl.

[0223] The configuration and the operational effect of the cooling bowl (1q) according to the seventeenth embodiment of the present invention are identical to the fifteenth embodiment of the present invention.

[0224] The upper part (2q) of the cooling bowl (1q) forms a hemispherical-shaped top plate with a summit at the center, an annular frame around the rim of the top plate, and a plurality of half marble-shaped protrusions on the top plate for draining the condensed water to avoid the food getting wet.

[0225] The water inlet (33) on bottom of the lower part (3q) has a rubber plug (5q), which has a smooth lateral surface without thread. The mouth of the water inlet (33) has installed a rubber bushing having slippery inner surface with elasticity to tightly sealing the tube.

[0226] If the bowl is accidentally heated, the rubber plug (5q) will be off from the water inlet (33) to release the pressurized air by itself, working as a safety valve.

[0227] FIG. 36 is a schematic view of the exploded cooling utensil according to the eighteenth embodiment of the present
invention. FIG. 37 is the schematic view of the assembled cooling utensil according to the eighteenth embodiment of the present invention. FIG. 38 is an overall outlook of the assembled cooling utensil according to the eighteenth embodiment of the present invention. FIG. 39 is the cross sectional view of the cooling utensil according to the eighteenth embodiment of the present invention. FIG. 40 is an outlook of the alternative top plate of the assembled cooling utensil according to the eighteenth embodiment of the present invention. FIG. 41 is a practical serving on the alternative top plate of the cooling utensil according to the eighteenth embodiment of the present invention. FIG. 42 is a cross sectional view of the practical serving on the alternative top plate of the cooling utensil according to the eighteenth embodiment of the present invention.

The cooling utensil (1r) according to the eighteenth embodiment of the present invention comprises a cooling plate unit (200) and a heat emitting unit (300). The heat emitting unit (300) comprises a base (108), cooling fan (107), heat emitting plate (106), a power source, thermal sensor and thermometer. The cooling plate unit (200) comprises a fixture plate (104), thermal element (101), rectangular-shaped insulation pad (102), thermal exchanger (103), sealant (27), upper frame (2r), lower frame (3r), elastic tube (4r) and a number of the fastening bolts (105) for assembly. The elastic tube (4r) is sealed by a plug bolt (5r). Additionally, a cover (9r) is used to cover the upper frame (2r).

Alternatively, the fixture plate (104), thermal element (101), rectangular insulation pad (102), and thermal exchanger (103) of the cooling plate unit (200) could assemble to be a part of the heat emitting unit (300).

The upper frame (2r), which is the surface for serving the food, forms a plurality of grooves (23) formed in the radial direction from the center to the peripheral edge for draining the condensed water to avoid the food getting wet.

As seen in FIGS. 40 to 42, the top plate has pre-template cap holder to place a cold dish (14), glasses (15) and bottled beer (13). The pre-template plate forms a plurality of punched out circular holders (23x) for placing the glasses and bottles and a large oval holder for placing a dish.

The cooling cavity (25) has surrounded by an insulation (12), which has same shape of the pre-template plate for prevent loosing cooling.

It is not shown in the figure, but it is possible to divide the top plate into multiple compartments for serving the various kinds of food.

The lower frame (3r), which is a base for supporting the upper frame (2r), contains a pair of long-shaped elastic tubes (4r). The cooling cavity (25) is formed outside of the elastic tubes (4r) in the lower frame (3r) for filling water or coolant. The lower frame (3r) forms a pair of openings at one lateral wall to mount the water inlets (33) for inserting the pair of the elastic tubes (4r). The water inlets (33) have installed a pair of bushings for mounting the sealing rings (43) on the steps formed inside of the bushings and mounting the plug bolts (5r) at the mouth of the water inlets (33) for sealing the cooling cavity (25) to prevent leaking of the water.

The elastic tube (4r) made of the material having flexiblity, restoring capabibility and water proof, comprises a long tube body, a bushing at the mouth and a sealing ring (43). The water inlet (33) has installed a bushing (33x) at the openings and the plug bolts (5r) mounted at the center for sealing the cooling cavity.
the plate (106), cooling fan (107), the thermometer, the thermal sensor, power supply unit and the control unit.

[0248] The power supply unit converts the alternate current (AC) to the direct current (DC).

[0249] The thermal sensor detects the temperature of the upper frame of the chill (or heat) emitting unit for transmitting the detected signal to the control unit. The control unit monitors the power supply according to the setting temperature. The thermometer, which is installed on the cooling plate unit (200), displays the current operating temperature of the heat emitting unit (300). Alternatively, the temperature of the cooling plate unit (200) can be separately displayed.

[0250] So far, the heat emitting unit (300) has assembled with the components of the chill (heat) emitting plate (106), cooling fan (107) and the power supply unit on the base (108). Further, the thermometer and the control unit are attached at the outer lateral wall of the base. However, the arrangement of components in the heat emitting unit (300) can be varied depending on the shape of the cooling unit.

[0251] Further, the power supply unit can be chargeable, either a charging means for directly contacting the both terminals or a non-contacting means, which is used a magnetic induction means that the magnetic field generated on the first coil is induced to the second coil of the battery to supply the current.

[0252] The operating process and the effects of the cooling utensil (1r) according to the eighteenth embodiment of the present invention are as follows:

[0253] First, the cooling plate unit (200) is placed on the heat emitting unit (300). Then, the power supply unit is turned on to supply the power, the thermal element (101) starts to absorb the heat from the upper unit to emit the lower unit. Therefore, the upper unit is getting cold, but the lower unit getting hot. Accordingly, the cooling plate unit (200) is getting cold, so that the water in the cooling cavity (25) is freezing. If it is too hot, the cooling fan (107) in the heat emitting unit (300) starts rotating to cooling down the thermal element (101) for normal operation.

[0254] Herein, as expanding the volume when the fully filled water in the cooling cavity (25) of the upper frame (2r) is freezing, the elastic tube (4r) is squeezed. On the other hand, the ice is melting during the serving, the elastic tube (4r) is restored. Because the cooling cavity (25) is always fully filled with the mixture of the ice and melting water, the upper unit (2r) is in contact with the ice to efficiently transfer the cooling to the serving food. Due to shrinking and expansion of the elastic tube (4r), the upper unit (2r) is prevented the possible damages or distortion from the freezing.

[0255] The upper unit (2r) may have the pre-template cup holder to place a cold dish, glasses and bottles, which is suitable to use in a restaurant or bar for the guests, who stay longer for private chatting, or a buffet restaurant, which display the many kind of cold foods.

[0256] Such a thermal element (101) is adopted for freezing the water in the cooling cavity. Thus, it is possible to produce the various type of cooling plate unit (200). If the power supply is not available, it is conveniently separated the heat emitting unit (300) for using the cooling plate unit (200) only.

[0257] FIG. 43 is a schematic view of the exploded cooling utensil according to the nineteenth embodiment of the present invention. FIG. 44 is the schematic view of the assembled cooling utensil according to the nineteenth embodiment of the present invention. FIG. 45 is an overall outlook of the assembled cooling utensil according to the nineteenth embodiment of the present invention.

[0258] The cooling utensil (1r) according to the nineteenth embodiment of the present invention comprises a cooling plate unit (210) and a chilling unit (310). The chilling unit (310) comprises a base (115), expansion coil (111), compressor (114), condenser (115), cooling fan (116), insulation (112), cooling plate (113), power supply unit, controlling unit, thermal sensor and thermometer. The cooling plate unit (210) comprises an upper frame (2), sealant (27), lower frame (3s), and a number of the fastening bolts (105) for assembly. Further, the cooling plate unit (210) contains the elastic tube (4s) inside thereof, and the plug bolt (5r) is sealed the water inlet. Additionally, a cover (9r) is used to cover the upper frame (2r).

[0259] The upper frame (2), which is the surface for serving the food, forms a plurality of grooves (23), formed in the radial direction from the center to the peripheral edge for draining the condensed water to avoid the food getting wet.

[0260] It is not shown in the figure, but it is possible to divide the upper frame (2r) into multiple compartments for serving the various kinds of food.

[0261] The lower frame (3s), which is a base for supporting the upper frame (2r), contains a pair of long-shaped elastic tubes (4s). The cooling cavity (25) is formed outside of the elastic tubes (4s) in the lower frame (3s) for filling water or coolant. The lower frame (3s) forms a pair of openings at one lateral wall to mount the water inlets (33r) for inserting the pair of the elastic tubes (4s). The water inlets (33) have installed a pair of bushings for fixedly mounting the sealing rings (43) on the steps formed inside of the bushings and mounting the plug bolts (5s) at the mouth of the water inlets (33) for sealing the cooling cavity (25) to prevent leaking of the water.

[0262] The elastic tube (4s) made of the material having flexibility, restoring capability and water proof, comprises a long tube body, a bushing at the mouth and a sealing ring (43). The water inlet (33) has installed a bushing (33r) at the openings and the plug bolts (5s) mounted at the center for sealing the cooling cavity.

[0263] The plug bolts (5s) form the mail threads without bolt head for mounting to the water inlets (33).

[0264] A frame sealing (27) is placed between the upper frame (2r) and the lower frame (3s) for sealing. As shown in the figure, the cover (9r) is separately provided. At least one pair of the latches is oppositely installed on the rim of the upper frame (2r) to lock or open.

[0265] It is not shown in the figure, but it is possible to install the safety valve on the upper frame (2r) or the lower frame (3s).

[0266] The components of the cooling plate unit (210) are assembled as follows: first, the rectangular shaped sealant (27) is installed to seal the upper frame (2r) and the lower frame (3s); the fastener bolts (7s) are used to assemble the upper frame (2r) and the lower frame (3s) of the cooling plate unit (210); the elastic tube (4s) is inserted into the cooling plate unit (210) through the water inlet (25), then the cooling cavity (25) formed between the lower frame (3s) and the outside of the elastic tubes (4s) is fully filled the water or coolant; the plug bolt (5s) is mounted on the water inlet (33) to complete the assembly of the cooling plate unit (210).

[0267] The cooling plate (113) made of a material having good conductivity, such as copper or aluminum is effectively reflect the chilly, which is emitted from the expansion coil (111), to the cooling plate unit (210). The insulation (112)
forming a rectangular box is installed on the bottom and the lateral walls to surround the expansion coil (111) to efficiently improve the cooling effect. The expansion coil (111) made of copper tube is emitting the cooling to the cooling plate unit (210). The compressor (114) compresses the incoming coolant gas to be a highly pressurized gas with high temperature for discharging to the condenser (115).

[0268] The condenser (115) is cooling down the high pressure and temperature gas to be a low pressure and temperature by the cooling fan (116) to discharge the expansion coil (111).

[0269] The cooling fan (116) having the blade and motor is forcibly circulating the air to accelerate the cooling effect of condenser (115) to escalate the efficiency.

[0270] A rectangular box shaped base (117) contains the expansion coil (111), compressor (114), condenser (115), cooling fan (116), control unit, thermal sensor and thermometer.

[0271] The thermal sensor detects the surface temperature of the upper frame (2s) to transmit the control unit. The controller including a temperature adjuster turns on and off the power according to the transmitted signal and the setting temperature. The thermometer is display the currently detected temperature of the upper frame (2s).

[0272] As discussed, the chilling unit (310), which is supported on the rectangular box shaped base (117) contains the components of the expansion coil (111), compressor (114), condenser (115), cooling fan (116), control unit, thermal sensor and thermometer. The assembly process of the chilling unit (310) is as follows that: first the compressor (114) and the condenser (115) are connected to the expansion coil (111); and the cooling fan (116) is installed; then control unit, thermal sensor and thermometer are installed: the insulation is installed surrounding the rectangular box shaped base (117) to complete the assembly of the chilling unit (310).

[0273] As noted, it is possible to alter the arrangement of the components in the chilling unit (310) depending on the shapes of the cooling unit.

[0274] The operating process and the effects of the cooling utensil (1s) according to the nineteenth embodiment of the present invention are as follows: first, the cooling plate unit (210) is placed above the chilling unit (310). Next, turn the power switch on, so that the expansion coil (111) is getting cold to freeze the water in the cooling cavity (25) of the cooling plate unit (210). Further, the cooling fan (116) in the chilling unit (310) starts to rotate for cooling down the condenser to improve the operating efficient.

[0275] Using such a coolant for freezing the water in the cooling cavity, it is possible to produce the various type of cooling plate unit (210). If a power supply is not available, it is conveniently separated the chilling unit (310) for using the cooling plate unit (210) only. The cooling utensils (1; 1s) according to the eighteenth and nineteenth embodiments of the present invention are installed on the dining table.

What is claimed is:

1-39. (canceled)

40. A cooling utensil, which is a proof of freezing crack and distortion, the cooling utensil comprising:
   a upper part (2) forming a plate shape for containing a food, a lower part (3) having some shape of the upper part (2) for assembling the upper part (2) to be one body, said lower part (3) being as a base, an elastic plate (4) having properties of flexibility, restoring capability and water proof, formed smaller shape than that of the lower part (3) for fitting, a cavity (25) formed between the upper part (2) and elastic plate (4) for filling water or coolant, and a plug bolt (5) to seal the water inlet of the cavity (25), a fastening bolt (7) and sealing ring (6) for assembling the upper part (2), the lower part (3) and the elastic plate (4).

41. The cooling utensil as claimed in claim 40, further comprising a tube type supporting post (26) integrally attached under the upper part (2), a water channel (26a) directed to both lateral sides, a water inlet (33) integrally attached to the lower part (3) forming a flowing passage around the fastening bolt (7) to match with the supporting post (26), said elastic plate (4) located between the upper part (2) and lower part (3) forming an opening for passing through the water inlet (33), said cavity (25) being selectively filled either water or coolant, and said fastening bolt (7) inserted through the supporting post (26) to tightly assemble the elastic plate (4), upper part (2) and lower part (3), all together.

42. The cooling utensil as claimed in claim 40, wherein said plug bolt (5) further comprising a bolt head (51) forming an outer hollow and an inner hollow, an outer sealing seat (54a) formed on a step adjacent to the outer hollow and the inner hollow inside of a plug cap bolt (55) to mount an outer sealing ring (57) and an outer valve (54), an inner sealing seat (53a) forming on a step adjacent to the inner hollow and for mounting an annulling sealing ring (56) and an inner valve (53), an inner valve (53) threaded to a tip of a T-shaped valve rod (52) and the outer valve (54) formed at a head of the T-shaped valve rod (52), and a compression spring (58) mounted on a stem of the T-shaped valve rod (52) for exerting a tension between the inner valve (53) and the plug cap bolt (55), wherein said inner valve (53) and said outer valve (54) mounted on the T-shaped valve rod (52) is simultaneously acting as a safety valve when the utensil is over pressurized.

43. The cooling utensil as claimed in claim 40, wherein said upper part and lower part forming a rectangular tray shape including a pair of springs (8) for mounting on a mounting seat, which is located between the elastic plate (4a) and the lower part (3a) for assisting the restoring force when the elastic plate (4a) is exerting a recovering force and preventing deflection of the elastic plate (4a).

44. The cooling utensil as claimed in claim 40, wherein said upper part and lower part forming a bowl shape, said elastic plate having property of flexibility and elasticity for attaching on a surface of the bowl, and said fastening bolt (36) for assembling the upper part and the lower part to form a body, said fastening bolt (36) having a function of safety valve.

45. The cooling utensil as claimed in claim 44, wherein said fastening bolt (36) further comprising a plug bolt (5) forming a hollow channel at center with no bolt head, a sealing seat (53b) forming at a conjunction point of a diameter step down inside of the hollow channel for mounting an annulling sealing ring (56a), and a T-shaped valve (53c) having a round head and a tip forming a pin hole for inserting a split pin (59a), said annulling sealing ring (56a) is inserted into the channel, a spring (58a) and a washer (59) are inserted into the stem of the T-shaped valve (53c), and the split pin (59a) put into the pin hole to be the plug bolt (5) having a function of a safety valve.

46. The cooling utensil as claimed in claim 40, wherein said upper part (2) has formed a convex-shaped top with a series of grooves (23) from top to edge in the radial directions to drain the condensed water, an expansion circular flange
(20) forming thin layers with a hollow between the layers at a junction of the upper part (2j) and the lower part (3j) for absorbing expansion or shrinking, the lower part (3j) forming a bellows-type handle (10) having elastically restoring force for preventing the distortion of the utensil, and a cap nut (11) forming a female thread to close the water inlet.

47. The cooling utensil as claimed in claim 40, further comprising a cooling cavity (31) formed inner space of the cooling bowl to fill water or coolant for freezing, said lower part (36) having a circular opening at one lateral wall to form a water inlet (33), said circular opening mounted an inlet busing, a water inlet (33) having a bushing (33α) and a plug bolt (5α) mounted at the center for sealing the cavity, an elastic tube (4k) made of material having flexibility, elastically restoring force and water proof is inserted into the cooling cavity (31) through the water inlet, and a plug bolt (5α) for closing the water inlet (33), wherein said lower part (36) has built a dual wall to form a vacuum gap between the inner wall and the outer wall for insulation, said upper part (2k) has formed a plurality of protrusions (22) for draining the condensed water.

48. The cooling utensil as claimed in claim 40, wherein said upper part has formed inclined surface from circumferential edge to top with a plurality of protrusions (22) to drain the condensed water, the lower part (3p) having a water inlet (33) forming female thread to mate a male thread of a cap nut (5α).

49. The cooling bowl as claimed in claim 40, wherein said upper part (2p) forms a hemispherical-shaped top plate inclined to summit and a plurality of grooves (23) formed in the radial direction from the summit to the circumferential edge for draining the condensed water, the lower part (3p) having a water inlet (33) formed flanged circular opening with a female thread for mounting a plug bolt (5p).

50. The cooling bowl as claimed in claim 40, wherein said upper part (2p) forms a hemispherical-shaped inclined to a center, and a plurality of protrusions for draining the condensed water, the water inlet (33) installed a rubber bushing on bottom of the lower part (3p) to mount a rubber plug (5p) for elastically sealing.

51. A cooling utensil, which is a proof of freezing-crack and distortion, the cooling utensil comprising:

a cooling cavity formed inner space of the cooling utensil to fill water or coolant for freezing,

a base forming rectangular box-shape with topless,

a cooling fan including a motor and blades and mounted inside the base,

a cooling plate unit (200) having an upper frame (2r), lower frame (3r) and an elastic tube (4r),

a heat emitting unit (300) installed above the cooling fan (107) for transmitting heat from a chill (heat) emitting plate (106),

an upper frame (2r) forming a rectangular shaped box with opened bottom having a water inlet at a lateral wall,

a lower frame (3r), which is a base for supporting the upper frame (2r),

an elastic tube (4r) made of a material having elastically restoring force and water proof for inserting into the cooling cavity of the upper frame,

a plug bolt (5r) for sealing the water inlet (33),

a thermal element (101) located under the upper frame to absorb heat from upper part and emit the heat to the lower part,

an insulation pad (102) has a square opening at the center to install the thermal element (101) for thermal communicating,
a thermal element (101) adopting Peltier-Effect for absorbing heat from top surface and emitting the heat to lower surface,
a fixture plate (104) having good heat conduction to install under the insulation pad (102) and the thermal element (101) for transmitting heat to the emitting plate (106), and

a number of fastening bolts (105) for assembling the lower frame to upper frame, the cooling plate unit (200) is placed over the heat emitting unit (300).

52. The cooling utensil as claimed in claim 51, the cooling utensil further comprising an expansion coil (111) connecting to a compressor (114) and condenser (115) mounted on the base in the lower frame, a cooling fan (116) for cooling down heats discharged from the condenser (115), an insulation (112) installed above the expansion coil for blocking out heat transfer, a cooling plate (113) mounted above the expansion coil for reflecting chilly to the upper frame, an upper frame forming a rectangular shaped box with bottomless having a water inlet, a lower frame forming a rectangular shaped box with topless for mounting the upper frame, and the cooling plate unit (210) is placed over the chilling unit (310).

53. The cooling utensil as claimed in claim 51, wherein said cooling plate unit (200) assembled with the fixture plate (104), thermal element (101), insulation pad (102), thermal exchanger (103) are placed over the heat emitting unit (300), wherein said heat emitting unit (300) comprising a power supply unit, a thermal sensor a thermometer, and an upper frame cover (9r), said upper frame (2r) forming a plurality of grooves (23) formed in the radial direction from the center to the peripheral edge for draining the condensed water, wherein said power supply unit is adopted a direct charging means for directly contacting both terminals.

54. The cooling utensil as claimed in claim 51, wherein said chilling unit (310) further comprises a power supply unit, controlling unit, thermal sensor and thermometer, and a cover (9r) for covering the upper frame (2r), the upper frame (2r) formed a plurality of grooves (23) in radial direction to drain the condensed water, and cover latch with hinge installed oppositely on the rim of the upper frame (2r) for locking or opening.

55. The cooling utensil as claimed in claim 54, wherein said power supply unit is adopted a non-contacting means, which is used a magnetic induction means that the magnetic field generated on the first coil is induced to the second coil of the battery to supply the current.

56. A cooling utensil, which is a proof of freezing-crack and distortion, the cooling utensil comprising:

an upper part forming a cylindrical-shaped container with downward opening having a mail thread (21α) on outer wall, and an annular shaped frame having a hat-shape, which is slightly inclined outward, for serving food on it, a lower part forming a cylindrical-shaped container without a top and having a female thread (35) on inner wall for mating to the mail thread (21α) of the upper part, an elastic plate forming a disk-shape to fit under a rim of the mail thread (21α) of the upper part (2c),
a set of fastening bolts for assembling the upper part, the lower part and the elastic plate to seal the water cavity.
57. The cooling utensil as claimed in claim 56, wherein said upper part forms a cup and said elastic plate forming a flat hat shaped small and shallow basin with annular frame for mating an annular shaped sealing ring.

58. The cooling utensil as claimed in claim 56, wherein said upper part forms a small basin being divided into two by a central compartment and said elastic plate forming a flat hat shaped small and shallow basin with annular frame for mating an annular shaped sealing ring.

59. The cooling utensil as claimed in claim 56, wherein said upper part comprises an elastic insulator between inner and outer walls, a pair of springs mounted on a pair of mounting seats between the elastic plate and the lower part for assisting restoring force when the elastic plate is exerted recovering force to prevent deflection of the elastic plate, said upper part includes a lid to match with the upper portion of the upper part for sealing, wherein the upper part made of a solid material, a lower part made of the material having flexibility and elasticity.

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