Title: RADIANT LIQUID HEATING CONTAINER

Abstract: A radiant liquid heating device includes a container for holding a liquid. The container includes an opening for dispensing the fluid and a closed bottom. A base member is mounted relative to the closed bottom. The base member is spaced a predetermined distance relative to the closed bottom to provide an air gap therebetween. The base member is exposed to a heat source wherein the base member shields the bottom of the container from being in direct contact with the heat source to provide a source of radiant heat for maintaining a liquid disposed within the container at a predetermined temperature.
RADIANT LIQUID HEATING CONTAINER

BACKGROUND OF THE INVENTION

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present application claims priority under 35 USC 119 to U.S. Provisional Patent Application No. 60/916,434 filed on May 7, 2007 the entire contents of which are hereby incorporated by reference.

BACKGROUND OF THE INVENTION

Field of the Invention

[0002] The present invention relates to a radiant liquid heating container wherein a base member is mounted relative to the bottom of the container with a predetermined space providing an air gap between the container and the base for maintaining a liquid disposed within the container at a predetermined temperature.

Description of Background Art

[0003] Hitherto, a container for maintaining a liquid at a predetermined temperature is normally exposed directly to a heat source. After the liquid is heated on the heat source for a certain period of time, the liquid in the container may be burned by the direct contact of the container relative to the heat source. This is a particular problem with respect to coffee that is brewed and thereafter exposed directly to a heat source. The heat source makes point contact with the container to burn certain portions of the coffee.

[0004] More specifically, a liquid product, such as coffee, is maintained in a heated condition by placing the container holding the liquid directly on a heat source, such as a burner. Normally, three points of contact are made between the container and the burner for conducting the heat of the burner to the container. At the points of contact with the burner, the container is heated to a very high temperature that results in a burning of the liquid within the container. When coffee is disposed in the container, the coffee is burned and the liquid within the container is boiled off to produce a coffee product that is not fit for consumption.

[0005] In addition, a thermos may be used for storing a heated liquid. However, with time the liquid within the thermos will cool and thus become unsuitable for consumption.
SUMMARY AND OBJECTS OF THE INVENTION

[0006] It is an object of an embodiment of the present invention to provide a radiant heater for maintaining a liquid within a container at a predetermined temperature without adversely affecting the taste of the liquid.

[0007] It is another object of an embodiment of the present invention to provide a radiant heater for maintaining a liquid within a container at a predetermined temperature by displacing the container to form a gap between the container and a base member for heating the container by use of radiant heat while eliminating the point contact between the container and the burner.

[0008] These and other objects of the invention are achieved by providing a radiant liquid heating container that includes a container for holding a fluid with an opening for dispensing the fluid and a closed bottom. A base member is mounted relative to the closed bottom. The base member is spaced a predetermined distance relative to the closed bottom to provide an air gap there between. The base member is exposed to a heat source wherein the base member shields the bottom of the container from being in direct contact with the heat source to provide a source of radiant heat for maintaining a liquid disposed within the container at a predetermined temperature.

[0009] Further scope of applicability of the present invention will become apparent from the detailed description given hereinafter. However, it should be understood that the detailed description and specific examples, while indicating preferred embodiments of the invention, are given by way of illustration only, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art from this detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] The present invention will become more fully understood from the detailed description given hereinbelow and the accompanying drawings which are given by way of illustration only, and thus are not limitative of the present invention, and wherein:

[0011] Fig. 1 is a perspective view of a container for heating a liquid;

[0012] Fig. 2 is a perspective view of a base member that is formed to fit the bottom of the container illustrated in Fig. 1;
[0013] Fig. 3 is a perspective view of the base member with a dark surface coating the interior of the base member;

[0014] Fig. 4 is an exploded view illustrating the container being mounted on the base member;

[0015] Fig. 5 is a perspective view illustrating the container with the base member being secured relative thereto;

[0016] Fig. 6 is a cross-sectional view of the container and the base member illustrating the gap that is formed between the bottom of the container and the base member; and

[0017] Fig. 7 is a cross-sectional view of a metal container with a base member illustrating the gap that is formed between the bottom of the container and the base member.

**DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**

[0018] Fig. 1 illustrates a container 10 for holding a liquid. The container 10 includes an opening 12 for dispensing the liquid and a closed bottom 14. Figs. 2 and 3 illustrate a base member 20 for mounting relative to the container 10. The base member 20 includes an interior surface 22 with a circumferential surface 26 and a closed bottom 24. As illustrated in Fig. 3, the interior surface may be coated with a non-reflective material 26.

[0019] As illustrated in Figs. 4 and 5, the base member 20 is adapted to be mounted relative to the closed bottom 14. As illustrated in Fig. 6, the base member 20 is spaced a predetermined distance 30 relative to the closed bottom 14 to provide an air gap there between. In one embodiment of the invention, the gap may be 1/8 of an inch, .625 cm.

[0020] The base member 20 is adapted to be exposed to a heat source, such as an electric heater with a certain watt/density of heat being supplied to the plate that is mounted on the heat source. The base member 20 shields the bottom 14 of the container 10 from being in direct contact with the heat source to provide a source of radiant heat for maintain a liquid disposed within said container 10 at a predetermined temperature.

[0021] In an embodiment of the invention, the container 10 may be constructed of glass and the base member 20 may be constructed of aluminum or any other suitable metallic material.

[0022] The interior surface 22 of said base member 20 is coated with a non-reflecting surface 26 for enhancing the transmission of radiant heat transmitted to the container 10. The non-reflecting surface 26 may be black paint or any material for aiding in the transmission of radiant heat to the container 10.
[0023] The base member 20 may be sealed relative to the container 10 for forming a water
proof and air tight gap disposed between the closed bottom 14 of the container 10 and the
interior surface 22 of the base member 20. The seal may be constructed of plastic or the seal
may be a silicone seal.

[0024] The base member 20 includes an outer circumferential surface 28 for engaging an
outer circumferential surface 18 of the container 10 at a predetermined point 32. The
predetermined point 32 is displaced upwardly from a bottom portion 24 of the base member
20 to prevent spot heating of a liquid disposed within the container 10.

[0025] In one embodiment of the invention, the base member 20 is removably mounted
relative to the container 10 to permit removal of the base member 20 from the container 10
for cleaning. In addition, spacer members 34, 36 may be disposed between the base member
20 and the container 10 for maintaining the gap there between.

[0026] As illustrated in Fig. 7, the container 100 may be constructed of metal and the base
member 120 may be constructed of aluminum or any other suitable metallic material.

[0027] The interior surface 122 of said base member 120 is coated with a non-reflecting
surface 126 for enhancing the transmission of radiant heat transmitted to the container 100.
The non-reflecting surface 126 may be black paint or any material for aiding in the
transmission of radiant heat to the container 100.

[0028] The base member 120 may be sealed relative to the container 100 for forming a water
proof and air tight gap disposed between the closed bottom 114 of the container 100 and the
interior surface 122 of the base member 120. The seal may be constructed of plastic or the
seal may be a silicone seal.

[0029] The base member 120 includes an outer circumferential surface 128 for engaging an
outer circumferential surface 118 of the container 100 at a predetermined point 132. The
predetermined point 132 is displaced upwardly from a bottom portion 124 of the base
member 120 to prevent spot heating of a liquid disposed within the container 100.

[0030] The base member 120 illustrated in Fig. 7 may be removably mounted relative to the
container 100 to permit removal of the base member 120 from the container 100 for cleaning.
In addition, spacer members 134, 136 may be disposed between the base member 120 and the
container 100 for maintaining the gap there between.

[0031] The invention permits a liquid disposed with the container 10, 100 to be maintained at
a predetermined temperature by use of radiant heat and not conductive heat. By using radiant
heat to maintain a liquid such as coffee at a predetermined temperature the present invention avoids problems in the prior art wherein the coffee is burned by using conduction to heat at least three points on the bottom of the container. Normally, if conduction heat is used, the coffee would be heated to 300 to 500 degrees Fahrenheit at the three points of contact with the container which will result in a burning of the coffee located in the particular areas in the container adjacent to the three points of contact. In addition, the conduction heat applied to the container will result in a boiling off of the water in the coffee which will render the coffee unfit for consumption. The present invention avoids the problems of the prior art to provide coffee or soup that is maintained at a predetermined temperature without burning or boiling off the product to make it unacceptable for consumption.

[0032] The invention being thus described, it will be obvious that the same may be varied in many ways. Such variations are not to be regarded as a departure from the spirit and scope of the invention, and all such modifications as would be obvious to one skilled in the art are intended to be included within the scope of the following claims.
WHAT IS CLAIMED IS:

1. A radiant liquid heating container comprising:
   a container for holding a liquid, said container including an opening for dispensing the
   fluid and a closed bottom; and
   a base member adapted to be mounted relative to the closed bottom, said base
   member being spaced a predetermined distance relative to said closed bottom to provide an
   air gap there between;
   said base member being adapted to be exposed to a heat source wherein the base
   member shields the bottom of the container from being in direct contact with the heat source
   to provide a source of radiant heat for maintain a liquid disposed within said container at a
   predetermined temperature.

2. The radiant liquid heating container according to claim 1, wherein the container is
   constructed of glass and the base member is constructed of aluminum.

3. The radiant liquid heating container according to claim 1, wherein an interior
   surface of said base member is coated with a non-reflecting surface for enhancing the
   transmission of radiant heat transmitted to the container.

4. The radiant liquid heating container according to claim 3, wherein the non-
   reflecting surface is black paint.

5. The radiant liquid heating container according to claim 1, wherein the base member
   is sealed relative to the container for forming a water proof and air tight gap disposed
   between the closed bottom of the container and an interior surface of the base member.

6. The radiant liquid heating container according to claim 5, wherein the seal is
   constructed of plastic.

7. The radiant liquid heating container according to claim 5, wherein the seal is a
   silicone seal.
8. The radiant liquid heating container according to claim 1, wherein the base member includes an outer circumferential surface for engaging an outer circumferential surface of the container at a predetermined point, said predetermined point being displaced upwardly from a bottom portion of the base member to prevent spot heating of a liquid disposed within the container.

9. The radiant liquid heating container according to claim 1, wherein said base member is removably mounted relative to said container to permit removal of the base member from the container for cleaning.

10. The radiant liquid heating container according to claim 1, and further including spacer members being disposed between said base member and said container for maintaining the gap there between.

11. The radiant liquid heating container according to claim 1, wherein the container is constructed of metal and the base member is constructed of metal.

12. A radiant liquid heating container comprising:
   a container including an opening for dispensing a liquid and a closed bottom; and
   a base member mounted relative to the closed bottom, said base member being spaced a predetermined distance relative to said closed bottom to provide an air gap there between;
   said base member being exposed to a heat source wherein the base member shields the bottom of the container from being in direct contact with the heat source to provide a source of radiant heat for maintain a liquid disposed within said container at a predetermined temperature without burning the liquid.

13. The radiant liquid heating container according to claim 12, wherein the container is constructed of glass and the base member is constructed of aluminum.

14. The radiant liquid heating container according to claim 12, wherein an interior surface of said base member is coated with a non-reflecting surface for enhancing the transmission of radiant heat transmitted to the container.
15. The radiant liquid heating container according to claim 14, wherein the non-reflecting surface is black paint.

16. The radiant liquid heating container according to claim 12, wherein the base member is sealed relative to the container for forming a waterproof and air tight gap disposed between the closed bottom of the container and an interior surface of the base member.

17. The radiant liquid heating container according to claim 16, wherein the seal is constructed of plastic.

18. The radiant liquid heating container according to claim 16, wherein the seal is a silicone seal.

19. The radiant liquid heating container according to claim 12, wherein the base member includes an outer circumferential surface for engaging an outer circumferential surface of the container at a predetermined point, said predetermined point being displaced upwardly from a bottom portion of the base member to prevent spot heating of a liquid disposed within the container.

20. The radiant liquid heating container according to claim 12, wherein said base member is removably mounted relative to said container to permit removal of the base member from the container for cleaning.

21. The radiant liquid heating container according to claim 12, and further including spacer members being disposed between said base member and said container for maintaining the gap therebetween.

22. The radiant liquid heating container according to claim 12, wherein the container is constructed of metal and the base member is constructed of metal.
### C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
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<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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<td>X</td>
<td>EP 0 477 669 A (EAGLE FLASK INDUSTRIES LTD) 1 April 1992 (1992-04-01)</td>
<td>1, 3, 5, 8, 11, 12, 14, 16, 19, 22</td>
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<td>column 13, line 26 - column 14, line 4; claim 3</td>
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<td>1, 3-5, 8, 11, 12, 14-16, 19, 22</td>
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<td>1, 8, 9, 11, 12, 19, 20, 22</td>
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**Further documents are listed in the continuation of Box C.**

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**See patent family annex.**

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**Name and mailing address of the ISA/**

European Patent Office, P.B. 5818 Patentlaan 2
NL-2280 HV Hilweg
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl
Fax (+31-70) 340-3016

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**Authorized officer:**

Reichhardt, Otto
<table>
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<th>Publication date</th>
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