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(71) Applicant: **STUDIO CQ(GUANGZHOU) LTD.** [CN/CN]; 102, Building 8, Wushan Area, Jinhui Road, Tianhe District, Guangzhou, Guangdong 510640 (CN).

(72) Inventors: **POT, Matthijs**; 102, Building 8, Wushan Area, Jinhui Road, Tianhe District, Guangzhou, Guangdong 510640 (CN). **BOUMAN, Arvid**; 102, Building 8, Wushan Area, Jinhui Road, Tianhe District, Guangzhou, Guangdong 510640 (CN). **GOOSSENS, Dennis**; 102, Building 8, Wushan Area, Jinhui Road, Tianhe District, Guangzhou, Guangdong 510640 (CN).

(74) Agent: **GUANGZHOU SINO PATENT & TRADEMARK AGENT CO., LTD.**; LI, Dekui, 301AB(01), 81-1 Xianlie Zhong Road, Yuexiu District, Guangzhou, Guangdong 510095 (CN).

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(54) Title: CONTAINER USED FOR ELECTROMAGNETIC HEATING

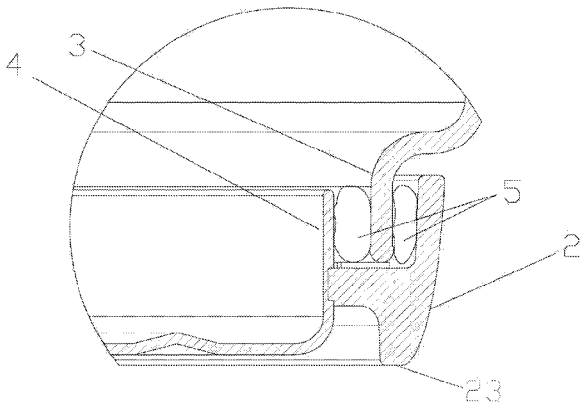


Figure 3

(57) Abstract: It relates to a container used for the electromagnetic heating, comprising a wall (3) of the container, a metal bottom (4) configured as a recess and a frame. The wall (3) of the container is around the metal bottom (4) and a frame (2) engaged with the metal bottom (4) is mounted around the wall (3). A glue (5) is applied to the gap between the inner surface of the wall (3) and the outer surface of the metal bottom (4) for adhesion, and to the gap between the outer surface of the wall (3) and the inner surface of the bottom frame (2) for adhesion. Both side of the wall (3) of the container adhere the frame (2) and the metal bottom (4) respectively through filling the glue (5) on the gaps there between, and well adhesion could be retained at high temperate and at a high heat rate.

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# CONTAINER USED FOR ELECTROMAGNETIC HEATING

## TECHNICAL FIELD

The present utility module relates to a container, in particular to a container used for the electromagnetic heating.

## BACKGROUND

The conventional container used for the electromagnetic heating is usually made of ferromagnetic metal, such as iron or stainless steel. Principle about electromagnetic heating is that the heating is realized due to eddy current induced by magnetic field, i.e. the magnetic field is created while electric current passes through coils, and the magnetic lines would be cut off when they passes through the bottom of metal container, whereby lots of tiny eddy current are generated, forcing iron atoms in the metal container to move at a high speed, collide each other and generate heat in the metal container itself, thereby the objects in the container could be heated. Therefore, the bottom of container must be made of ferromagnetic metal material, because the heat must be generated by eddy current induced by the magnetic field. Some containers are made of plastics, but transparent plastics has short life, low transparency, low scratch resistance, unsightly appearance due to dirt after been used for a long time, and cannot be used above 150℃. Some containers are made of metal, however, the inner could not be observed, and the appearance would be undesired.

Often, the container may be made of glass in order to observe the inner of container conveniently. It would be an issue that how the metal and glass adhere properly. Traditionally, a metal bottom with a recess shape is mounted at the outside of the glass container, and glue is supplied between the metal and the glass, making them adhere together. However, such adhesion has many disadvantages. For example, the glue is only coated between the inner side of the metal bottom and outer side of the glass, thus the area coated by the glue is not large enough to provide adhesive force. Thereby the metal and glass will come unglued easily. Although we could increase the height of metal bottom to increase the adhesive surface， the appearance of the container would be undesired. In fact, the adhesion is also brittle when the heating speeds up, for example, the heating power will be over 1500 watt. With respect to the container used for electromagnetic heating in the market, usually the wall is usually made of glass, and the bottom is made of metal. There are disadvantages as following: the metal bottom is heated, which is likely to burn users,

damage the table on which the container is placed. A lot of improvement has been made for the existing container used for electromagnetic heating by one skilled in the art, for example, applying heating membrane on the bottom of glass container, but the heating efficiency is low, water can not contact with the membrane if it is not food-grade, and service life is short.

## SUMMARY OF THE UTILITY MODEL

In order to solve these technical problems mentioned above, the present utility model provides a container used for the electromagnetic heating, comprising a wall, a metal bottom and a frame. The container can be circular, square, rectangular or other shapes. Preferably the present utility mode is circular. The metal bottom is a recess, and preferably the present utility model is circular recess. The wall of the container is around the metal bottom, and the frame is mounted around the wall and is engaged with the metal bottom. Glue is applied to the gap between the inner surface of the wall and the outer surface of the metal bottom for adhesion, and to gap between the outer surface of the wall and the inner surface of the frame for adhesion. As a result, the both sides of the wall of the container are coated with glue, which improve the adhesion performance at the bottom of the container greatly, preventing the adhesion from breaking down. The term “metal” in the present invention refers to ferromagnetic metal, which could be heated through eddy current induced by magnetic field.

Further, the metal bottom, frame and wall may comprise fillers arranged on the surface thereof, and the fillers may be spacer, coating, etc., in order to make the metal bottom, frame and wall engage with each other more accurately.

Further, the wall of the container is a step structure, and comprises a first part and a second part where both parts have different perimeters. The perimeter of the first part may either be larger than that of the second part, or be smaller than that of the second part. The first part is connected to the second part smoothly, and the frame adheres to the second part.

Further, the wall can be a circular ring, and the diameter of the first part is larger than that of the second part in a preferred embodiment according to the present utility model.

Further, the wall of the container is preferably made of glass, plastic or ceramic.

Further, when the frame is engaged with the metal bottom, the metal bottom is placed above the stand point of the frame. When putting the container on the table after the water in the container was boiled, the frame stands on the table while the metal bottom suspended without any

contact to the table, preventing the table from damaging.

Further, the frame is preferably made of material with low thermal conductivity, which could prevent heat from transferring, and achieve an anti-scald effect.

Further, the material with low thermal conductivity comprises plastic. Plastic has low thermal conductivity and good adhesion to glue.

Further, the frame can be connected to the metal bottom in the form of mechanical engagement, glue adhesion, or integrated mould etc. preferably, a protruded structure is configured on the frame, and corresponding connection structure is configured on the metal bottom to accommodate the protruded structure. The connection structure may be continuous, or discontinuous. The protruded structure may also be continuous, or discontinuous, to engage with the connection structure.

Further, the connection structure may be a groove or a hole. Preferably, continuous groove is used in the present invention. Correspondingly, the protruded structure is preferably continuous.

Further, several bulges are configured on the protruded structure. The bulges are capable of supporting the wall of container, in addition, it leaves enough gaps/spaces between the lower edge of wall of the container and the frame.

Further, glue is applied to fill the gap between lower edge of the wall and the frame, the adhesive force is therefore increased, and the possibility of leaking caused by weak adhesion between the frame and the wall is decreased, because the glue is applied to all the inner and outer surface, and lower edge of the wall for adhesion.

Further, the bulges are preferably configured symmetrically at identical interval.

Comparing with the prior art, the beneficial effect of the present utility model is as following:

1) Both sides of the wall of the container adhere the frame and the metal bottom respectively through filling glue in the gaps therebetween, and well adhesion could be retained at high temperate and at a high heat rate;

2) The frame is made of material with low thermal conductivity, and it is convenient to prevent the operator from scalding and avoid damage of the table.

## BRIEF DESCRIPTION OF THE DRAWINGS

The preferred embodiments of the present utility model will be described further in detail with reference to the following figures.

Figure 1 is a schematic view of the container according to the present utility model;

Figure 2 is a sectional view along A-A in Figure 1;

Figure 3 is an enlarged view of B portion in Figure 2;

Figure 4 is an enlarged view of wall of the container at B portion in Figure 2;

Figure 5 is a perspective view of the frame according to the present utility model;

Figure 6 is a vertical sectional view of the frame according to the present utility model;

Figure 7 is an enlarged view of C portion in Figure 6;

Figure 8 is a perspective view of the metal bottom according to the present utility model;

Figure 9 is a vertical sectional view of the metal bottom according to the present utility model;

Figure 10 is an enlarged view of D portion in Figure 9;

Figure 11 is a sectional view depicting the engagement between the frame and the metal bottom according to the present utility model;

Figure 12 is an explosive view of the container according to the present utility model.

List of reference characters:

1 container

2 frame

21 protruded structure

22 bulge

3 wall of the container

31 first part of the wall

32 second part of the wall

4 metal bottom

41 groove

5 glue

## DETAILED DESCRIPTION OF THE UTILITY MODEL

As shown in Figures 1-12, the structure of the preferred embodiment according to the present utility model is disclosed. A container used for the electromagnetic heating comprises a circular wall of container 3 made of glass, a circular metal bottom 4 and a circular plastic frame 2, which all are concentric, wherein the metal bottom 4 is a recess and made of ferromagnetic metal, the frame 2 is mounted around the bottom 4. A protruded structure 21 configured on the frame 2 can engage with a groove 41 provided on the metal bottom 4. The frame 2 is higher than the bottom 4 so that when they are fixed on, the frame 2 can stand on the heater while the bottom 4 suspended. The vertical cross section of the container is a step structure, and the wall 3 comprises a first part 31 and a second part 32 which are connected each other smoothly, wherein the diameter of the first part 31 is larger than that of the second part 32. The second part 32 is placed between the metal bottom 4 and the frame 2, and on several bulges 22 provided systemically at identical interval on the protruded structure 21. Then providing sufficient glue to the gaps between the frame 2 and the wall 3, between the wall 3 and the metal bottom 4, and between the lower edge of wall 3 and the frame 2, such that the wall 3, the metal bottom 4 and the frame 2 will constitute a container which can receive the liquid safely.

It should be understood that the embodiments described hereinbefore are merely preferred embodiments for describing the present invention more clearly and not for purposes of any restrictions or limitations on the invention. Therefore, various alterations or improvement by the one skilled in the art could be made on the basis of above description. All embodiments could not be exhaustively described herein. Any non-substantive, obvious alterations and variations without departing from technical solution of the present invention may be incorporated into ambit of the present invention.

# CLAIMS

1. A container used for the electromagnetic heating, wherein said container comprises a wall (3), a metal bottom (4) configured as a recess and a frame (2); Said wall (3) is around said metal bottom (4), and said frame (2) is mounted around said wall (3) and is engaged with said metal bottom (4); A glue (5) is applied to the gap between the inner surface of said wall (3) and the outer surface of said metal bottom (4) for adhesion, and to the gap between the outer surface of the wall (3) and the inner surface of said frame (2) for adhesion.

2. The container according to claim 1, wherein said metal bottom (4), said frame (2) and said wall (3) comprise fillers thereon.

3. The container according to claim 1, wherein said wall (3) is a step structure, and comprises a first part (31) and a second part (32) where both parts have different perimeters; Said first part (31) is connected to said second part (32) smoothly, and said frame (2) adheres to said second part (32).

4. The container according to claim 3, wherein said wall (3) is a circular ring, the diameter of said first part (31) is larger than that of said second part (32).

5. The container according to claim 1, wherein said wall (3) is made of glass, plastic or ceramic.

6. The container according to claim 1, wherein when said frame (2) is engaged with said metal bottom (4), said metal bottom (4) is placed above the stand point (23) of the frame (2).

7. The container according to claim 1, wherein said frame (2) is made of material with low thermal conductivity.

8. The container according to claim 7, wherein said material with low thermal conductivity comprises plastic.

9. The container according to claim 1, wherein a protruded structure (21) is configured on the frame

(2), and a corresponding connection structure (41) is configured on said metal bottom (4) to accommodate said protruded structure (21).

10. The container according to claim 9, wherein said connection structure (41) is a groove or a hole.

11. The container according to claim 9, wherein several bulges (22) are configured on said protruded structure (21).

12. The container according to claim 11, wherein said glue (5) is applied to fill the gap between a lower edge of said wall (3) and said frame (2).

13. The container according to claim 11, wherein said bulges (22) are configured symmetrically at identical interval.

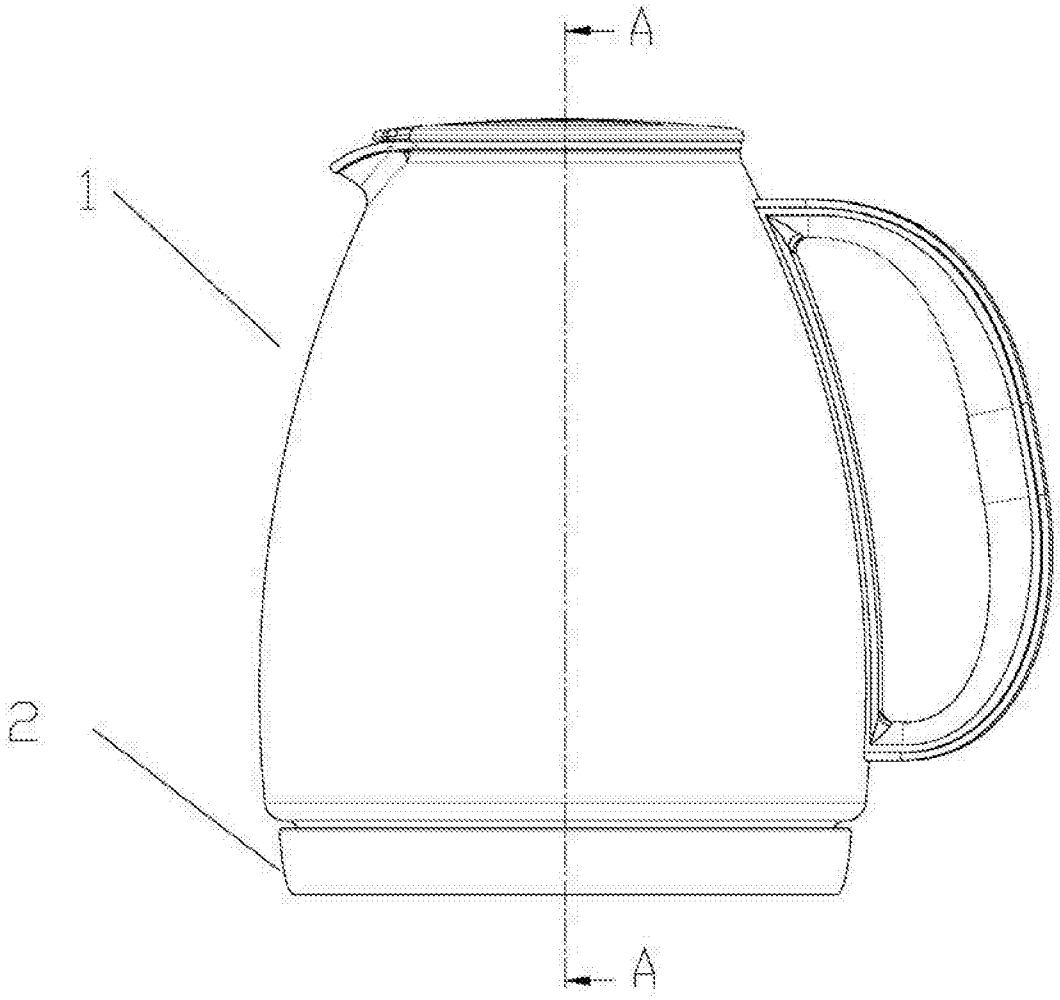


**Figure 1**

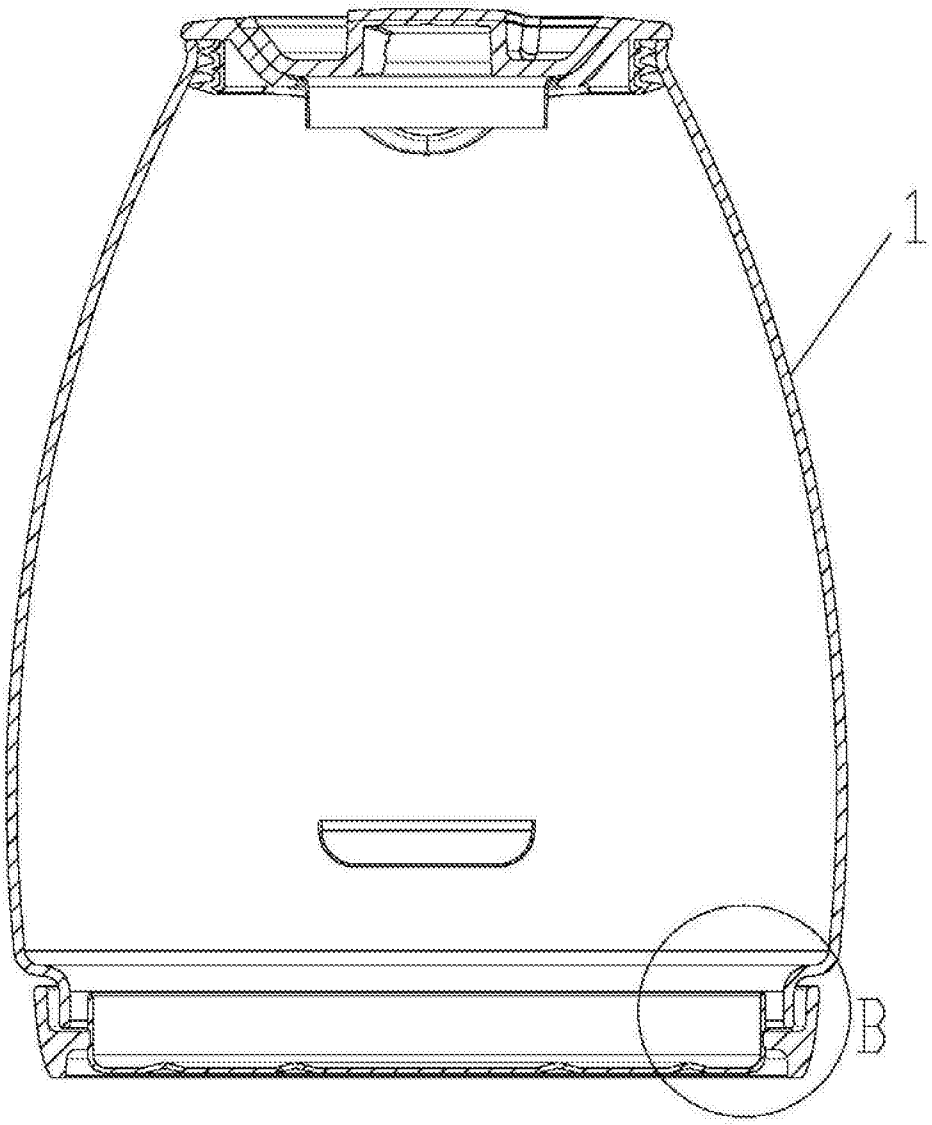


Figure 2

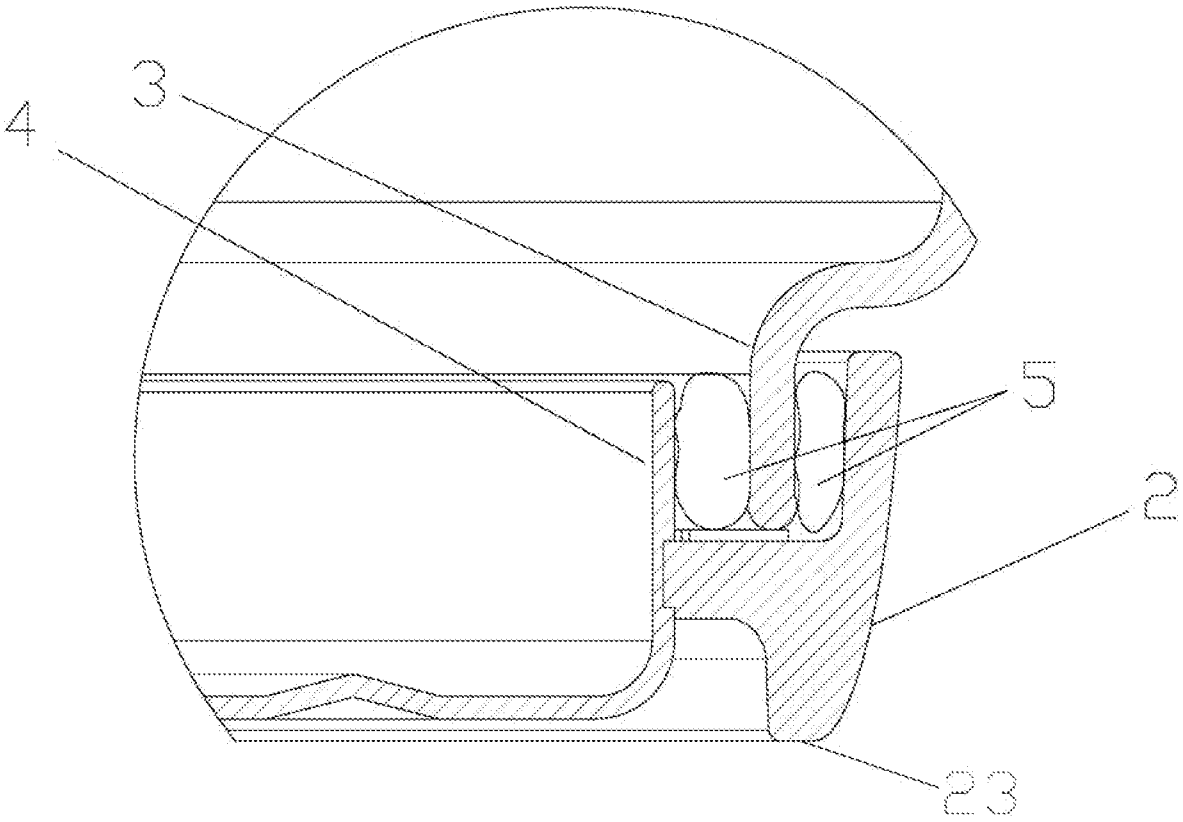


Figure 3

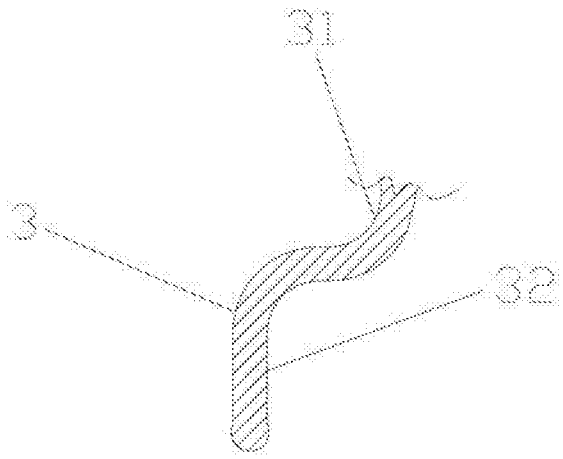


Figure 4

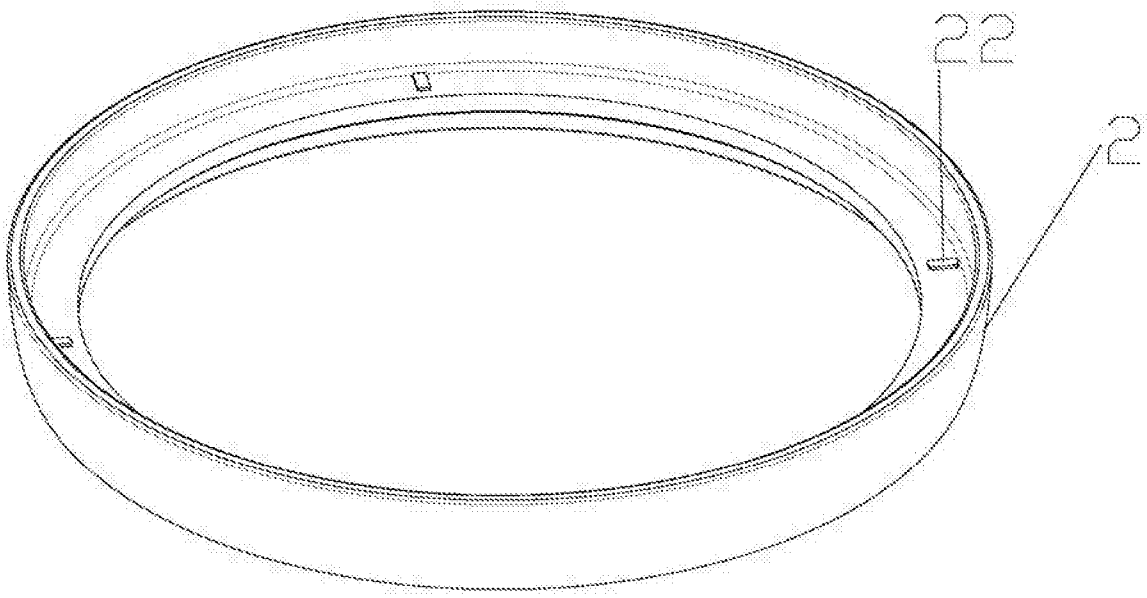


Figure 5

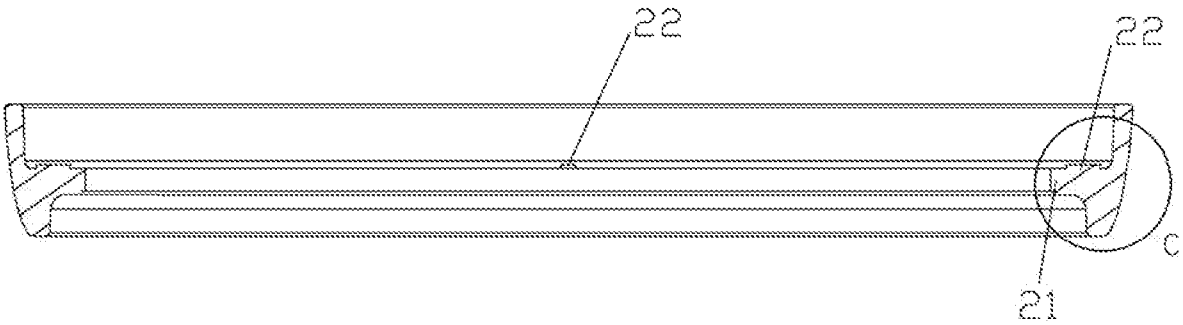


Figure 6

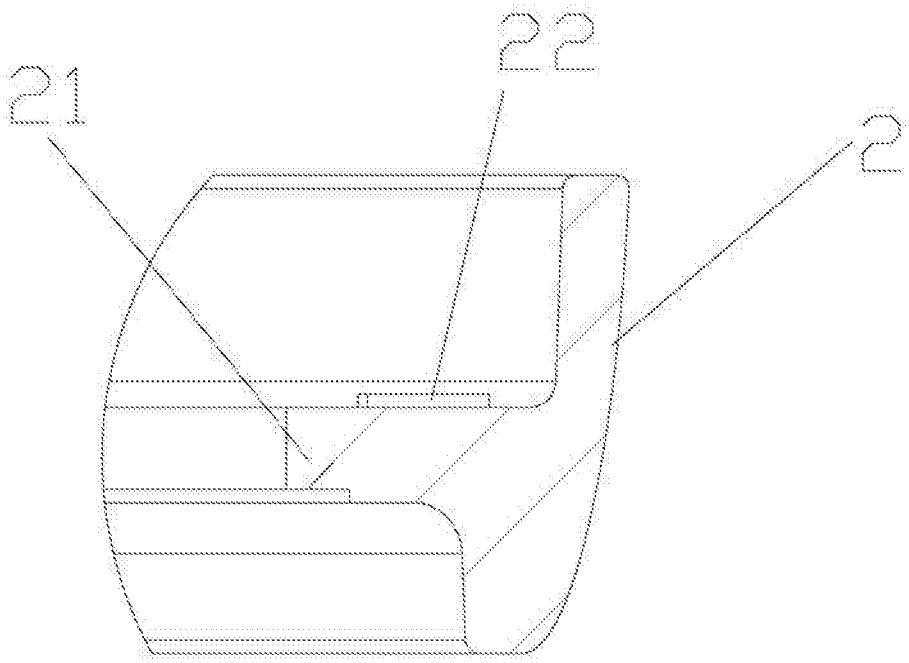


Figure 7

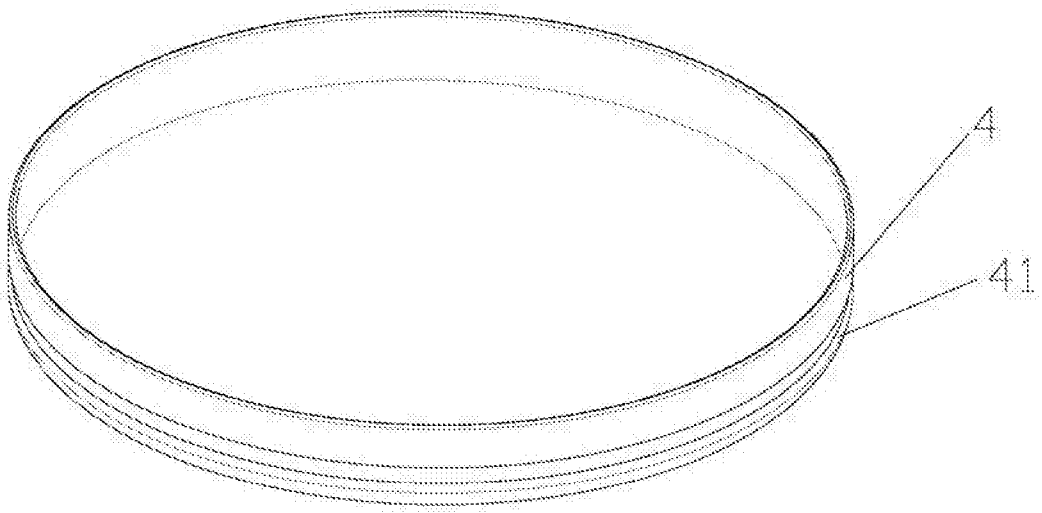


Figure 8

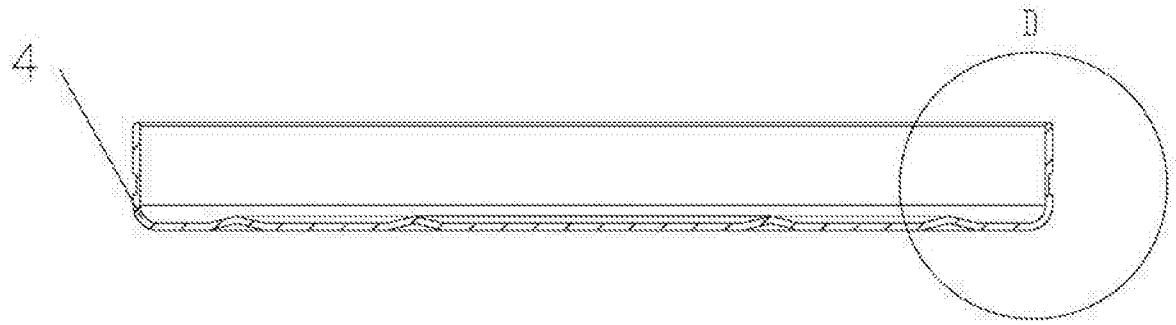


Figure 9

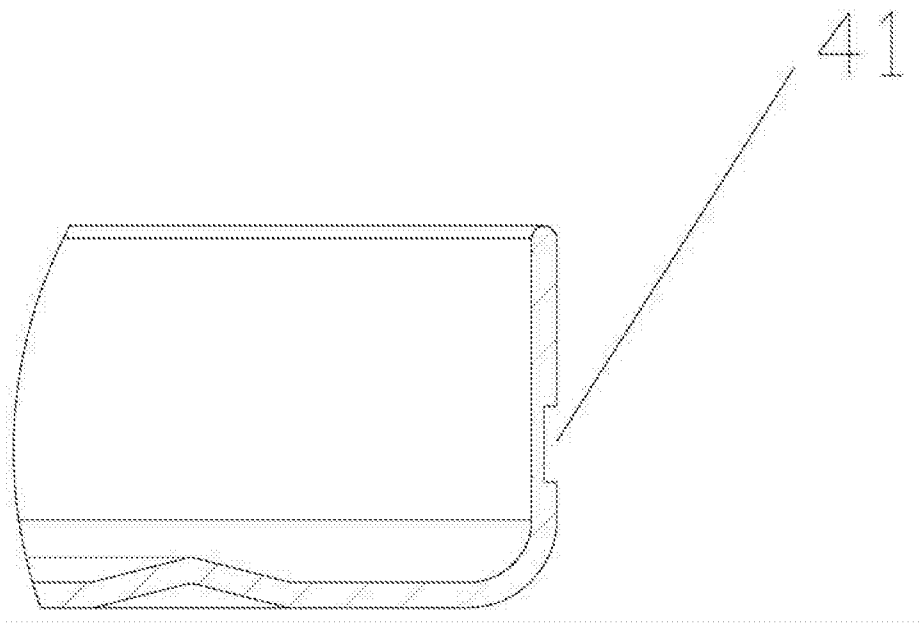


Figure 10

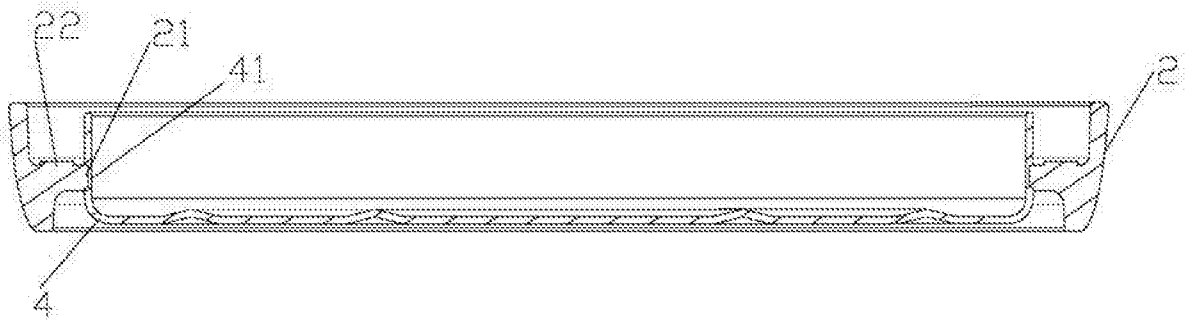


Figure 11

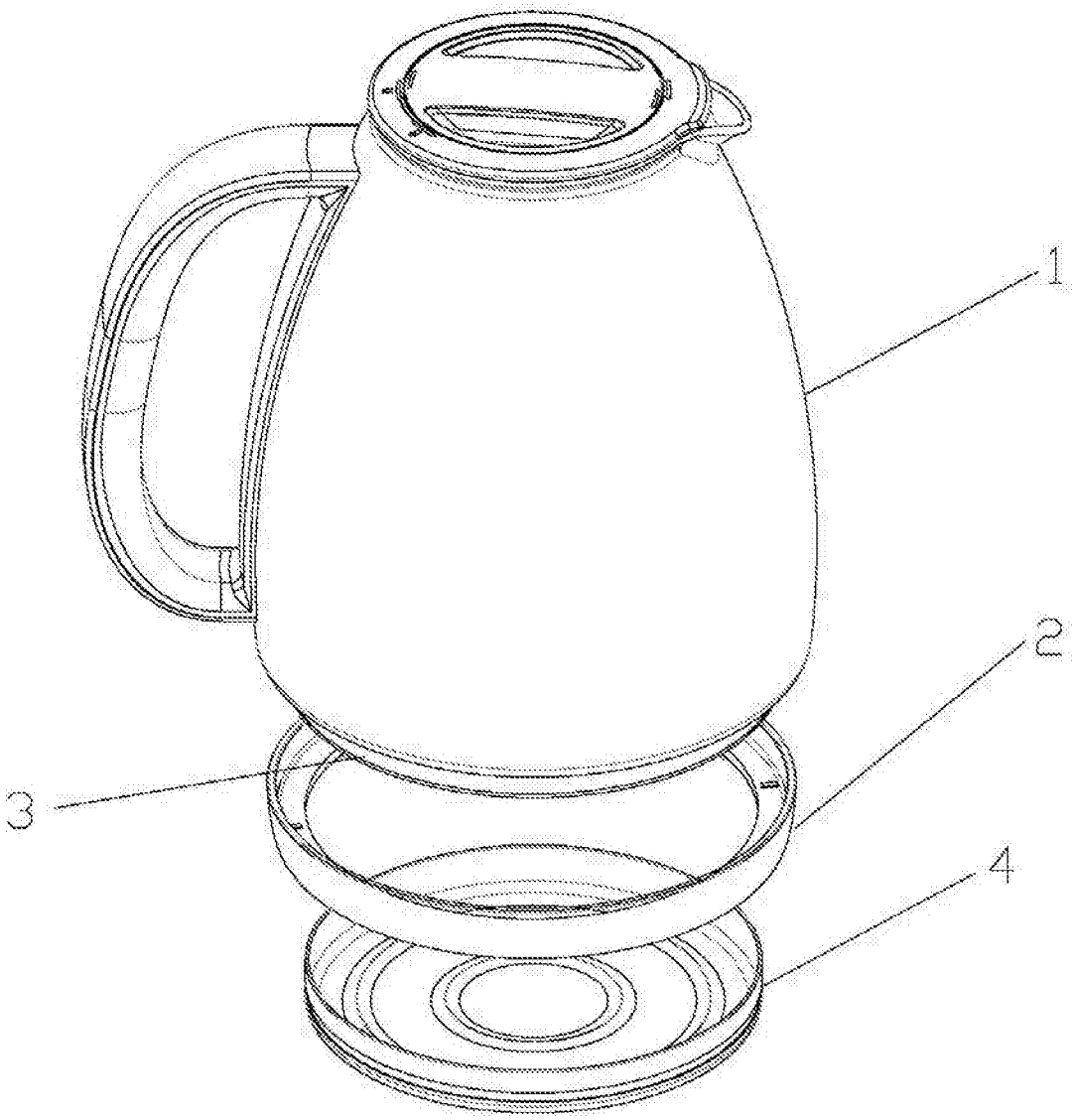


Figure 12

# INTERNATIONAL SEARCH REPORT

International application No.
**PCT/CN2014/085489**

## A. CLASSIFICATION OF SUBJECT MATTER

A47J 27/02 (2006.01) i

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A47J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI,EPODOC,CNPAT,CNKI,IEEE: protrud+, metal, chassis or plate or bottom or found+, loop or circle, glue, supprot+ or seat or chair or pedestal, pot or kattle or bottle or flask, electromagnetic, frame or case, notch or indentation or concave,heat+

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| Y | CN 103211486 A (CHEN, QIONGXIONG) 24 July 2013 (2013-07-24)<br>description, paragraphs [0029]-[0034] and figures 1-5 | 1-13 |
| Y | CN 2776219 Y (SANSHUI SYNTHETIC PLASTIC HARDWARE PRODUCT CO. LTD., FOSHAN CITY) 03 May 2006 (2006-05-03)<br>description, page 2, line 3-14 and figures 1-3 | 1-13 |
| Y | CN 102949087 A (ZHOU, LINBIN) 06 March 2013 (2013-03-06)<br>description, paragraphs [0041]-[0048] and figures 1-5 | 6 |
| A | CN 203226635 U (FU-CAO, JIUXING ET AL.) 09 October 2013 (2013-10-09)<br>the whole document | 1-13 |
| A | CN 202775847 U (LI, HANZHAO) 13 March 2013 (2013-03-13)<br>the whole document | 1-13 |

☐ Further documents are listed in the continuation of Box C. ☑ See patent family annex.

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"&" document member of the same patent family

| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| **30 October 2014** | **01 December 2014** |

| Name and mailing address of the ISA/CN | Authorized officer |
|---|---|
| **STATE INTELLECTUAL PROPERTY OFFICE OF THE P.R.CHINA(ISA/CN)**<br>**6,Xitucheng Rd., Jimen Bridge, Haidian District, Beijing 100088 China** | **ZHOU,Zhongtang** |
| Facsimile No. **(86-10)62019451** | Telephone No. **(86-10)01082245847** |

**INTERNATIONAL SEARCH REPORT**
**Information on patent family members**

International application No.
**PCT/CN2014/085489**

| Patent document cited in search report | Publication date (day/month/year) | Patent family member(s) | Publication date (day/month/year) |
|---|---|---|---|
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| CN 2776219 Y | 03 May 2006 | Non e | |
| CN 102949087 A | 06 March 2013 | CN 103385653 A | 13 November 2013 |
| CN 203226635 U | 09 October 2013 | Non e | |
| CN 202775847 U | 13 March 2013 | Non e | |