Conduction plate of induction heating cooking vessel

Disclosed herein is a conduction plate of an induction heating cooking vessel, the conduction plate including: a body part (22) contacting a lower surface of a vessel body (10) and having coupling holes (21) formed therein; a first vertical part (23) vertically extended upwardly from the coupling hole (21) of the body part (22) toward the vessel body (10); a first horizontal part (24) horizontally extended inwardly from an end portion of the first vertical part (23); a second vertical part (25) vertically extended upwardly from an end portion of the first horizontal part (24); and a second horizontal part (26) horizontally extended inwardly from an end portion of the second vertical part (25). Therefore, it is possible to improve heat conduction efficiency of the conduction plate and firmly and stably maintain a coupled state of the conduction plate.

[FIG. 7]
This application claims the benefit of Korean Patent Application No. 10-2012-0042314, filed on 23 April, 2012, entitled "Conduction Plate of Induction Heating Cooking Vessel", which is hereby incorporated by reference in its entirety into this application.

BACKGROUND OF THE INVENTION

1. Technical Field

The present invention relates to a conduction plate of an induction heating cooking vessel, and more particularly, to a conduction plate of an induction heating cooking vessel capable of rapidly heating a cooking vessel through induction heating.

2. Description of the Related Art

Generally, an induction heating method, which is a method of performing the heating by converting electrical energy into thermal energy by electromagnetic induction, has been utilized in various fields. Particularly, the induction heating has also been applied to a cooking vessel used to cook food. Since this induction heating cooking vessel has excellent functionality and usability, the demand thereof has increased.

Therefore, research into a conduction plate of the induction heating cooking vessel has been actively conducted.

The conduction plate of an induction heating cooking vessel according to the related art is configured to include a body part 2 contacting a lower surface of a vessel body 10; a vertical part 3 extended from the body part 2 in a vertical direction; and a horizontal part 4 extended from the vertical part 3 in a horizontal direction, as shown in FIG. 1.

Since the conduction plate 1 as described above has a structure in which it is upwardly bent once, in the case in which the vertical part 3 is formed to have a long length, coupling force with the vessel body 10 may be increased; however, a coupled part 11 of the vessel body 10 that is plastically deformed is not completely closely adhered to bent parts of the vertical part 3 and the horizontal part 4, such that the conduction plate 1 is deformed. Further, in the case in which the vertical part 3 is formed to have a short length, the coupled part 11 of the vessel body 10 that is plastically deformed is completely closely adhered to the bent parts of the vertical part 3 and the horizontal part 4; however, the coupling force with the vessel body 10 may be decreased. Further, stress is concentrated on one of the bent parts of the vertical part 3 and the horizontal part 4, such that there is a limitation in firmly maintaining a coupled state of the conduction part.

An object of the present invention is to provide a conduction plate of an induction heating cooking vessel capable of increasing a contact area with a vessel body and improving close adhesion force and coupling force with the vessel body.

According to an exemplary embodiment of the present invention, there is provided a conduction plate of an induction heating cooking vessel, the conduction plate including: a body part contacting a lower surface of a vessel body and having coupling holes formed therein; a first vertical part vertically extended upwardly from the coupling hole toward the vessel body; a first horizontal part horizontally extended inwardly from an end portion of the first vertical part; a second vertical part vertically extended upwardly from an end portion of the first horizontal part; and a second horizontal part horizontally extended inwardly from an end portion of the second vertical part.

FIGS. 1 to 3 are partial cross-sectional view showing a coupled state of a conduction plate of an induction heating cooking vessel according to the related art; FIG. 4 is a perspective view showing a coupled state of a conduction plate of an induction heating cooking vessel according to an exemplary embodiment of the present invention;
FIG. 5 is a plan view showing the conduction plate of an induction heating cooking vessel according to the exemplary embodiment of the present invention; FIG. 6 is a partial cross-sectional view showing a structure of the conduction plate of an induction heating cooking vessel according to the exemplary embodiment of the present invention; and FIG. 7 is a partial cross-sectional view showing the coupled state of the conduction plate of an induction heating cooking vessel according to the exemplary embodiment of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0014] Hereinafter, a conduction plate of an induction heating cooking vessel according to an exemplary embodiment of the present invention will be described in more detail with reference to the accompanying drawings.

[0015] The present invention relates to a conduction plate of an induction heating cooking vessel. FIG. 4 is a perspective view showing a coupled state of a conduction plate of an induction heating cooking vessel according to an exemplary embodiment of the present invention; FIG. 5 is a plan view showing the conduction plate of an induction heating cooking vessel according to the exemplary embodiment of the present invention; FIG. 6 is a partial cross-sectional view showing a structure of the conduction plate of an induction heating cooking vessel according to the exemplary embodiment of the present invention; and FIG. 7 is a partial cross-sectional view showing the coupled state of the conduction plate of an induction heating cooking vessel according to the exemplary embodiment of the present invention.

[0016] The conduction plate 20 of an induction heating cooking vessel according to the exemplary embodiment of the present invention is coupled to a lower portion of a vessel body 10 to serve to heat the vessel body 10 and has a structure in which it is bent toward the vessel body 10 twice.

[0017] The conduction plate 20 is configured to include a body part 22 contacting a lower surface of the vessel body 10; a first vertical part 23 extended from the body part 22; a first horizontal part 24 extended from the first vertical part 23; a second vertical part 25 extended from the first horizontal part 24; and a second horizontal part 26 extended from the second vertical part 25.

[0018] The body part 22 is made of a conductive material having a plate shape and is provided with a plurality of coupling holes 21.

[0019] Each of the coupling holes 21 has an isosceles triangular shape and is formed so that a vertex between two equal sides is disposed toward the center of the body part 22 and the other side is disposed at an outer side. Due to characteristics of the shape and the disposition structure of the coupling holes 21 as described above, coupling forces of concentric circles passing through the vertex between two equal sides and concentric circles passing through the other side may be appropriately distributed.

[0020] Meanwhile, in a plurality of concentric circles sharing the center with each other in the conductive plate 20, since an outer concentric circle has a circumference larger than that of an inner concentric circle, the outer concentric circle requires coupling force larger than that of the inner concentric circle.

[0021] In addition, the coupling holes 21 are arranged at the same interval in a circumferential direction in a concentric circle form from the center of the body part 22. Therefore, the coupling force of the body part 22 may be uniformly distributed and an area occupied by the coupling holes 21 in the body part 22 may be relatively decreased, thereby improving a heating effect.

[0022] Further, an interval between the coupling holes 21 arranged in a diameter direction and a distance between the coupling holes 21 arranged in the circumferential direction are substantially the same as each other, such that the coupling force is uniformly distributed in a radial direction as well as the circumferential direction.

[0023] Positions of the coupling holes 21 formed in the body part 22 may be appropriately selected in consideration of a thickness change of the conduction plate 20 generated when being processed by a press, or the like, dispersion of the coupling force between the conduction plate 20 and the vessel body 10, and efficient heat transfer between the conduction plate 20 and the vessel body 10.

[0024] The first vertical part 23 is vertically extended upwardly from the coupling hole 21 of the body part 22 toward the vessel body 10, the first horizontal part 24 is horizontally extended inwardly from an end portion of the first vertical part 23, the second vertical part 25 is vertically extended upwardly from an end portion of the first horizontal part 24, and the second horizontal part 26 is horizontally extended inwardly from an end portion of the second vertical part 25.

[0025] In the conduction plate 20 having the structure in which it is bent twice as described above, a plastic working amount of coupled part 11 protruding integrally with the vessel body 10 at a lower surface of the vessel body 10 and coupled to the conduction plate 20 is decreased, thereby making it possible to improve workability, and the coupled part 11 of the vessel body 10 that is plastically worked and the conduction plate 20 are completely closely adhered to each other to maximize an effective contact area, thereby making it possible to relatively improve heat transfer efficiency.

[0026] In addition, the coupling force with the vessel body 10 is dispersed in a uniform level at two bent parts, thereby making it possible to decrease a stress concentration amount.

[0027] Meanwhile, describing a specific shape of the conduction plate 20, a length of a segment connecting one of all points in regions of outer contact surfaces 27 of the first vertical part 23, the first horizontal part 24, the second vertical part 25, and the second horizontal part
26 and one of all points in regions of inner contact surfaces 28 of the first vertical part 23, the first horizontal part 24, the second vertical part 25, and the second horizontal part 26 to each other is the same as or larger than a thickness d of the body part 22. This is to improve durability and strength of the conduction plate 20.

[0029] In addition, it is advantageous in maintaining a uniform thickness that the inner contact surface 28 of the first horizontal part 24 and the outer contact surface 27 of the second vertical part 25 is positioned to be closer to the coupling hole 21 as compared with the outer contact surface 27 of the first vertical part 23, a thickness of the second vertical part 25 becomes thin, such that the second vertical part 25 becomes weak, or a space between the second vertical part 25 and the coupled part of the vessel body becomes small when the outer contact surface 27 of the second vertical part 25 is positioned to be closer to the coupling hole 21 in order to constantly maintain the thickness, such that it is difficult to plastically deform the coupled part; to the contrary, in the case in which the inner contact surface 28 of the second vertical part 25 is positioned to be more distant from the coupling hole 21 as compared with the outer contact surface 27 of the first vertical part 23, it is difficult to form the first horizontal part 24.

[0030] A manufacturing process of the conduction plate generated from the space.

[0031] Meanwhile, in the manufacturing process of the conduction plate as described above, the third step may be performed before the first step or the first and second steps may be simultaneously performed in a single press. However, it is preferable in view of maintaining a uniform thickness of the conduction plate 20 that the third step is performed after the first and second steps.

[0032] With the conduction plate of an induction heating cooling vessel according to the exemplary embodiment of the present invention, the coupled part has a structure in which it is bent twice, such that a contact area with the vessel body is increased, thereby making it possible to improve heat conduction efficiency. In addition, coupling force with the vessel body is increased, thereby making it possible to more firmly and stably maintain a coupled state of the conduction plate.

[0033] In addition, the stress applied to the conduction plate is distributed at two bent parts, thereby making it possible to secure durability of the conduction plate.

[0034] Further, the coupled part of the vessel body is completely closely adhered to the conduction plate, such that a space therebetween is not generated, thereby making it possible to efficiently prevent deformation of the conduction plate generated from the space.

Claims

1. A conduction plate of an induction heating cooking vessel coupled to a lower portion of a vessel body 10, the conduction plate comprising:

a body part 22 contacting a lower surface of the vessel body 10 and having coupling holes 21 formed therein;

a first vertical part 23 vertically extended upwardly from the coupling hole 21 toward the vessel body 10;

a first horizontal part 24 horizontally extended inwardly from an end portion of the first vertical part 23;

a second vertical part 25 vertically extended upwardly from an end portion of the first horizontal part 24; and

a second horizontal part 26 horizontally extended inwardly from an end portion of the second vertical part 25.

2. The conduction plate of claim 1, wherein a length of a segment connecting one of all points in regions of outer contact surfaces 27 of the first vertical part 23, the first horizontal part 24, the second vertical part 25, and the second horizontal part

3. A conduction plate of an induction heating cooking vessel coupled to a lower portion of a vessel body 10, the conduction plate comprising:

a body part 22 contacting a lower surface of the vessel body 10 and having coupling holes 21 formed therein;

a first vertical part 23 vertically extended upwardly from the coupling hole 21 toward the vessel body 10;

a first horizontal part 24 horizontally extended inwardly from an end portion of the first vertical part 23;

a second vertical part 25 vertically extended upwardly from an end portion of the first horizontal part 24; and

a second horizontal part 26 horizontally extended inwardly from an end portion of the second vertical part 25.
25, and the second horizontal part 26 and one of all points in regions of inner contact surfaces 28 of the first vertical part 23, the first horizontal part 24, the second vertical part 25, and the second horizontal part 26 to each other is the same as or larger than a thickness d of the body part 22.

3. The conduction plate of claim 1, wherein the outer contact surface 27 of the first vertical part 23 and the inner contact surface 28 of the second vertical part 25 are positioned on the same line (A-A).

4. The conduction plate of claim 1, wherein the inner contact surface 28 of the first horizontal part 24 and the outer contact surface 27 of the second horizontal part 26 are positioned on the same line (B-B).

5. The conduction plate of claim 1, wherein each of the coupling holes 21 has an isosceles triangular shape and is formed so that a vertex between two equal sides is disposed toward the center of the body part 22.

6. The conduction plate of claim 1 or 5, wherein a plurality of coupling holes 21 are arranged at the same interval in a circumferential direction in a concentric circle form in which they share the center of the body part 22 with each other.
[FIG. 1]
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The present search report has been drawn up for all claims.

Place of search: Munich  
Date of completion of the search: 11 June 2013  
Examiner: Novelli, Bruno
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For more details about this annex: see Official Journal of the European Patent Office, No. 12/82
REFERENCES CITED IN THE DESCRIPTION

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