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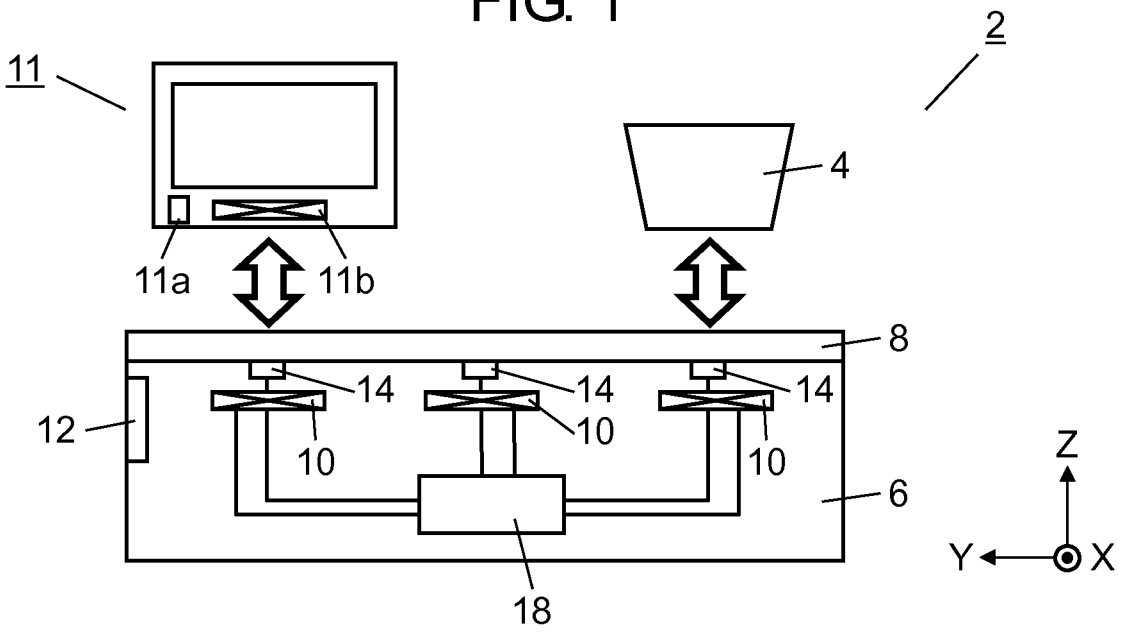
(54) INDUCTION HEATING COOKER

(57) Induction heating cooker (2) includes top plate (8) on which heating target (4) or non-contact power receiving device (11) is mounted; and a plurality of coils (10) that are disposed so that at least one coil exists directly under heating target (4) or non-contact power receiving device (11) when heating target (4) or non-contact power receiving device (11) is mounted on an arbitrary position on top plate (8), and induction-heats heating target (4), or supply power to non-contact power receiving device (11). Induction heating cooker (2) includes temperature detector (14) that detects a temperature of top plate (8); and a guide unit that shows a region of which a temperature detected by temperature detector (14) is a predetermined temperature or less to a user as a mountable region of non-contact power receiving device (11). Therefore, induction heating cooker (2) in which convenience is improved is provided.

EP 3 344 009 A1

FIG. 1



Description

TECHNICAL FIELD

[0001] The present disclosure relates to an induction heating cooker for induction heating a heating target such as a cooking pan.

BACKGROUND ART

[0002] In the related art, in an induction heating cooker, for example, a plurality of heating coils are disposed directly under a top plate. The induction heating cooker induction-heats a metal cooking pan that is the heating target mounted on the top plate or the like using the heating coils.

[0003] An induction heating cooker that supplies power to a non-contact power receiving device using heating coils or the like is also disclosed (for example, see PTL 1).

[0004] Recently, an induction heating cooker is required to further improve convenience.

[0005] However, in the configuration of the induction heating cooker of PLT 1, a place on which the non-contact power receiving device is mounted is defined at one location. Therefore, the non-contact power receiving device cannot be disposed at a position desired by a user. That is, the induction heating cooker of PTL 1 still has room for improvement from the viewpoint of convenience.

Citation List

Patent Literature

[0006] PTL 1: International Publication No. 2013/038694

SUMMARY OF THE INVENTION

[0007] The present disclosure provides an induction heating cooker capable of improving convenience.

[0008] That is, an induction heating cooker of the disclosure includes a top plate on which a heating target or a non-contact power receiving device is mounted; and a plurality of coils that are disposed so that at least one coil exists directly under the heating target or the non-contact power receiving device under the top plate when the heating target or the non-contact power receiving device is mounted on an arbitrary position on the top plate, and induction-heats the heating target mounted on the top plate, or supply power to the non-contact power receiving device. The induction heating cooker further includes a temperature detector that detects a temperature of the top plate; and a guide unit that shows a region of which a temperature detected by the temperature detector is a predetermined temperature or less to a user as a mountable region of the non-contact power receiving device.

[0009] According to the configuration, the guide unit that shows a region of which the temperature of the top plate is a predetermined temperature or less is provided to be capable of mounting the non-contact power receiving device on an arbitrary position on the top plate. Therefore, it is possible to mount the non-contact power receiving device on a region having a low temperature. As a result, it is possible to provide the induction heating cooker in which convenience of a user is improved.

BRIEF DESCRIPTION OF DRAWINGS

[0010]

FIG. 1 is a vertical sectional view of an induction heating cooker according to an exemplary embodiment.

FIG. 2 is a plan view of the induction heating cooker according to the exemplary embodiment.

FIG. 3 is a flow chart illustrating a method of displaying and showing a mountable region of a non-contact power receiving device in the induction heating cooker.

FIG. 4A is a plan view for explaining the method by the flow chart of FIG. 3.

FIG. 4B is a plan view for explaining the method by the flow chart of FIG. 3.

FIG. 4C is a plan view for explaining the method by the flow chart of FIG. 3.

FIG. 4D is a plan view for explaining the method by the flow chart of FIG. 3.

FIG. 5 is a plan view illustrating a modification example about a disposition of coils of the induction heating cooker according to the exemplary embodiment.

DESCRIPTION OF EMBODIMENT

[0011] Hereinafter, an induction heating cooker of an exemplary embodiment of the disclosure will be described with reference to the drawings. The disclosure is not limited to the exemplary embodiment.

(Exemplary Embodiment)

[0012] Hereinafter, the induction heating cooker according to the exemplary embodiment of the disclosure will be described with reference to FIGS. 1 and 2.

[0013] FIG. 1 is a vertical sectional view of the induction heating cooker according to the exemplary embodiment. FIG. 2 is a plan view of the induction heating cooker according to the exemplary embodiment.

[0014] Induction heating cooker 2 is a cooker (IH cooker) having a configuration for induction heating, for example, heating target 4, or the like.

[0015] As illustrated in FIG. 1, induction heating cooker 2 of the exemplary embodiment includes body unit 6, top plate 8, a plurality of coils 10, and the like. If a user mounts heating target 4 on top plate 8, heating target 4 is heat-

cooked by induction heating via coils 10 directly under heating target 4.

[0016] When a user mounts non-contact power receiving device 11 on top plate 8, induction heating cooker 2 has a configuration to perform a supply of power and charging of non-contact power receiving device 11 via coil 10 directly under non-contact power receiving device 11.

[0017] That is, coil 10 of induction heating cooker 2 of the exemplary embodiment functions as a multifunctional coil performing the supply of power and charging of non-contact power receiving device 11, as well as performing induction heating of heating target 4.

[0018] Induction heating cooker 2 of the exemplary embodiment further includes attached display unit 12, temperature detectors 14, light emitting units 16 (see FIG. 2), controller 18, and the like.

[0019] Hereinafter, each configuration of induction heating cooker 2 will be described in order.

[0020] Hereinafter, as illustrated in the drawings, a width direction will be described as an X direction, a depth direction as a Y direction, and a height direction as a Z direction in induction heating cooker 2.

[0021] Heating target 4 is configured of, for example, an object such as a cooking pan that is heated by induction heating cooker 2. At least a part of heating target 4 is formed of metal. Therefore, an eddy current flows through the metal due to magnetic force lines generated by coils 10 and induction heating of heating target 4 can be performed.

[0022] Body unit 6 configures a base portion for a user to cook using induction heating cooker 2. Top plate 8 is disposed on an upper portion of body unit 6. Top plate 8 is formed of, for example, crystallized glass having translucency or the like, and configures a top board of induction heating cooker 2. Heating target 4, non-contact power receiving device 11, or the like described below is mounted on the upper portion of top plate 8.

[0023] Coil 10 generates the magnetic force lines to perform induction heating of heating target 4, or to perform a supply of power, or charging non-contact power receiving device 11, or the like. As illustrated in FIG. 2, coil 10 of the exemplary embodiment is configured in a donut shape having a hollow center portion when viewed from above. Light emitting unit 16 which is described below is disposed around coil 10.

[0024] As illustrated in FIG. 2, coils 10 are arranged in a grid pattern (XY plane) composed of a plurality of columns (Y direction) and a plurality of rows (X direction). With this arrangement, even when heating target 4 or non-contact power receiving device 11 is mounted on an arbitrary position on top plate 8, induction heating, the supply of power, or charging can be performed by one coil 10 disposed directly under at least heating target 4 or non-contact power receiving device 11.

[0025] Non-contact power receiving device 11 is configured of, for example, a device such as a tablet which can supply of power and charging by at least one coil 10 disposed directly under top plate 8 when being disposed on top plate 8.

[0026] Therefore, non-contact power receiving device 11 includes communication unit 11a and power receiving coil 11b on an inside thereof. Communication unit 11a communicates with controller 18 within body unit 6 described below.

[0027] Power receiving coil 11b configures, for example, a secondary coil that generates power by receiving an electromagnetic field generated by coil 10 (for example, corresponding to a primary coil) mounted directly under when non-contact power receiving device 11 is mounted on top plate 8. Therefore, non-contact power receiving device 11 is configured to supply the electromagnetic field generated by coil 10 via power receiving coil 11b.

[0028] Non-contact power receiving device 11 is exemplified by an electric device including a heater such as a water heater and a grill, an electric device including a motor such as a mixer, and a power receiving device that receives electric power with non-contact manner such as a lighting device and an iron. In this case, the mixer includes, for example, a configuration of automatically stirring food placed in a container of the mixer and performing heating cooking by induction heating of the container.

[0029] Hereinafter, a griller will be described as an example of non-contact power receiving device 11 of the exemplary embodiment. The griller is a device of heating cooking food disposed within a storage by a heater driven by power supplied via power receiving coil 11b. As illustrated in FIG. 2, a case where non-contact power receiving device 11 has a size in which a size thereof in a plan view corresponds to four coils 10 (two rows and two columns respectively) is described as an example.

[0030] Induction heating cooker 2 of the exemplary embodiment includes attached display unit 12. Attached display unit 12 is configured of, for example, a liquid crystal display or the like, and displays information (cooking information) about cooking of, for example, induction heating cooker 2. As illustrated in FIG. 1, attached display unit 12 is provided to be fixed to a front surface (front side in the Y direction) of body unit 6. The installation position of attached display unit 12 is not limited to the front surface of body unit 6 and, other than that, may be provided on, for example, the upper surface of body unit 6, or the like.

[0031] Temperature detector 14 is configured of, for example, a temperature sensor such as a thermistor and detects a temperature of top plate 8 above coil 10. In the exemplary embodiment, one temperature detector 14 is provided for each coil 10. In FIG. 1, a configuration in which temperature detector 14 is provided to be in contact with a lower surface of top plate 8 is illustrated as an example, but is not limited to the example. For example, temperature detector 14 may be disposed around coil 10 or the like as long as it is a position at which the temperature of top plate 8 can be detected.

[0032] As illustrated in FIG. 2, light emitting units 16 are individually disposed around coils 10 respectively. Light emitting unit 16 makes the user can watch (visually recognizable) the position of coil 10 generating the electromagnetic field through top plate 8 using light emission. Light emitting unit 16, in the exemplary embodiment, is configured of, for example, a ring-shaped LED provided so as to surround coil 10. As described below, light emitting unit 16 functions as a guide unit for showing a mountable region of non-contact power receiving device 11.

[0033] Controller 18 is disposed within body unit 6 and controls an operation of induction heating cooker 2. Specifically, controller 18 is connected to the plurality of coils 10, attached display unit 12, and a plurality of temperature detectors 14 disposed within body unit 6, and controls the operations thereof.

[0034] Controller 18 is configured to be capable of wirelessly communicating with communication unit 11a of non-contact power receiving device 11. Therefore, controller 18 receives, for example, electric power, a signal of urgent stop, or the like from communication unit 11a.

[0035] Induction heating cooker 2 having the configuration described above employs a multi-coil configuration of layout free capable of mounting heating target 4 or non-contact power receiving device 11 on an arbitrary position on top plate 8. Therefore, the user can mount heating target 4 and non-contact power receiving device 11 on a desired position on top plate 8. Thus, it is possible to provide a configuration having a high degree of freedom for the user.

[0036] As described above, induction heating cooker 2 of the exemplary embodiment is configured.

[0037] Hereinafter, a method of showing the mountable region of non-contact power receiving device 11 on top plate 8 to the user using temperature detector 14 and light emitting unit 16 will be described with reference to FIGS. 3 and 4A to 4D.

[0038] FIG. 3 is a flow chart illustrating a method of displaying the mountable region of the display in the induction heating cooker. FIGS. 4A to 4D are plan views for explaining an example for displaying and showing the mountable region in order along the flow chart illustrated in FIG. 3.

[0039] As illustrated in FIG. 3, first, a signal is transmitted from non-contact power receiving device 11 to controller 18 of body unit 6 (step S1). Specifically, the user presses a button (not illustrated) provided in non-contact power receiving device 11. Therefore, communication unit 11a of non-contact power receiving device 11 transmits a signal to controller 18.

[0040] Controller 18 recognizes that non-contact power receiving device 11 is mounted on top plate 8 by the signal from communication unit 11a. In this case, controller 18 stores various types of information (for example, information of types and sizes of non-contact power receiving device 11, and the like) about non-contact power receiving device 11. Thus, when receiving the signal transmitted from non-contact power receiving device 11, controller 18 reads information about non-contact power receiving device 11.

[0041] Next, controller 18 confirms a state of heating using coil 10 (step S2). That is, controller 18 confirms whether or not each of the plurality of coils 10 is heating. In the exemplary embodiment, as illustrated in FIG. 4A, for example, it is confirmed that one coil 10a is heating. Therefore, it is possible to confirm that heating target 4 (not illustrated) receiving induction heating is mounted on the upper surface of top plate 8 that is positioned above coil 10a.

[0042] Next, controller 18 performs temperature determination of each coil 10 input from temperature detector 14 (step S3). Specifically, controller 18 determines whether or not a temperature detected by temperature detector 14 of coils 10 other than coil 10a that is confirmed being heated in step S2 and a peripheral region thereof is a predetermined temperature (for example, 60°C) or more. In this case, coil 10a that is confirmed being heated in step S2 and the peripheral region thereof correspond to region A1 illustrated in FIG. 4B. Thus, controller 18 determines whether or not the temperature detected by temperature detector 14 is the predetermined temperature or more in a region on top plate 8 excluding region A1.

[0043] As a result of the temperature determination, as illustrated in FIG. 4C, controller 18 determines that the temperature detected by temperature detector 14 is the predetermined temperature or more, for example, in region A2 corresponding to three coil 10b, coil 10c, and coil 10d adjacent to region A1 among the plurality of coils 10.

[0044] Next, controller 18 performs light emission display by light emitting unit 16 (step S4). Specifically, as illustrated in FIG. 4D, controller 18 performs light emission by light emitting unit 16 in a predetermined region A3 excluding region A1 and region A2 of which the temperature is determined as the predetermined temperature or more in step S3. That is, controller 18 causes region A3 having a low temperature excluding a region (for example, region A1 and region A2) having a high temperature to emit light. Therefore, controller 18 emits light and displays region A3 as a preferable region for mounting non-contact power receiving device 11 and guides the user.

[0045] In this case, controller 18 does not determine that region A4 (region on a front side in the Y direction) adjacent to region A2 illustrated in FIG. 4D is the predetermined temperature or more in step S3. Nevertheless, controller 18 does not control to cause light emitting unit 16 to emit light in step S4 for the following reasons.

[0046] This is because, as described above, the size of non-contact power receiving device 11 corresponds to the region of coils 10 of a range of total four coils of two rows and two columns respectively. That is, region A4 cannot secure a region of the size of four coils on which non-contact power receiving device 11 is mounted. Therefore, controller 18 controls light emitting units 16 so as not to emit light excluding region A4 from the mount-

able region of non-contact power receiving device 11. Therefore, controller 18 causes only light emitting units 16 of region A3 to emit light as the mountable region of non-contact power receiving device 11. As a result, the mountable region of non-contact power receiving device 11 can be further reliably shown to the user.

[0047] Therefore, the mountable region of non-contact power receiving device 11 of top plate 8 is displayed by light emission of light emitting units 16.

[0048] That is, according to the exemplary embodiment, controller 18 causes light emitting units 16 of region A3 having a low temperature to emit light and to be displayed as the mountable region of non-contact power receiving device 11, and to show the mountable region to the user. Therefore, the user can mount non-contact power receiving device 11 on safe region A3 emitting light and having a low temperature. Therefore, it is possible to prevent non-contact power receiving device 11 from being mounted on a region having a high temperature. Therefore, troubles of non-contact power receiving device 11 itself and occurrence of defects due to contact of the user with a region having a high temperature are prevented. As a result, convenience and safety can be further improved.

[0049] According to the exemplary embodiment, the multi-coil configuration capable of mounting heating target 4 or non-contact power receiving device 11 at an arbitrary position on top plate 8 is employed. Therefore, in the configuration, a safe region having a low temperature is displayed as the mountable region. Therefore, heating target 4 or non-contact power receiving device 11 can be reliably mounted on a safe region having a low temperature. That is, induction heating cooker 2 of the exemplary embodiment is excellent in usefulness such as guiding non-contact power receiving device 11 to the mountable region.

[0050] According to the exemplary embodiment, controller 18 executes display and guidance using light emitting unit 16 while receiving a signal of communication unit 11a of non-contact power receiving device 11. Therefore, for example, a configuration, in which a user presses a button of non-contact power receiving device 11 and thereby transmission of a signal is performed, is employed. Therefore, the user can perform the display and guidance using light emitting unit 16 at a predetermined timing. As a result, convenience of a user is further improved.

[0051] According to the exemplary embodiment, controller 18 stores information of the size of non-contact power receiving device 11. Controller 18 displays only a mountable region of non-contact power receiving device 11 using light emitting unit 16 based on information of a stored size. Therefore, the mountable region of non-contact power receiving device 11 can be further reliably shown to the user. As a result, convenience of a user can be further improved.

[0052] According to the exemplary embodiment, controller 18 controls light emission of light emitting units 16 so as not to emit light to the periphery (for example, regions A1 and A2) of coils 10a being heated and the unmountable region A4 of non-contact power receiving device 11. Therefore, even in a case of a peripheral region of coils 10a being heated and the region having a low temperature, controller 18 does not guide non-contact power receiving device 11 as the mountable region.

[0053] That is, it is possible to reduce the following influence on the periphery by heat cooking of heating target 4 by coils 10a.

[0054] Specifically, for example, in a case where heating target 4 that is heated by coils 10a contains moisture, water droplets having a high temperature may scatter around coils 10a. Scattered water droplets may adhere to non-contact power receiving device 11 or the user. Therefore, there is a concern that a cause of failure of non-contact power receiving device 11 or defects to the user occur. In the exemplary embodiment, control is performed such that the periphery of coil 10a being heated is excluded from the mountable region and light emitting units 16 does not emit light. Therefore, convenience of a user and the safety of induction heating cooker 2 can be further improved.

[0055] According to the exemplary embodiment, as temperature detector 14, a plurality of temperature sensors corresponding to coils 10 respectively are provided. Therefore, detection of a temperature corresponding to a region of each coil 10 can be performed. As a result, the mountable region of non-contact power receiving device 11 can be further reliably set based on the detected temperature.

[0056] According to the exemplary embodiment, showing of the mountable region of non-contact power receiving device 11 to the user is performed by the presence or absence of emitting light of light emitting unit 16. That is, light emitting unit 16 functions as a guide unit. Therefore, the user can visibly determine the mountable region of non-contact power receiving device 11. As a result, convenience of a user is further improved.

[0057] In the above description, the disclosure is described with reference to the exemplary embodiment, but the disclosure is not limited to the exemplary embodiment described above.

[0058] That is, in the exemplary embodiment, a configuration, in which light emitting unit 16 is the ring-shaped LED provided so as to surround the periphery of coil 10, is described as an example, but the disclosure is not limited to the example. The configuration of light emitting unit may be arbitrary as long as it is a light emitting unit that emits light so as to indicate the mountable region such as non-contact power receiving device 11. For example, a configuration of light emitting unit that emits light in a grid shape (grid pattern) may be adopted with a region of one coil as one unit (one grid).

[0059] In the exemplary embodiment, a configuration, in which the plurality of coils 10 are arranged in the grid pattern of a plurality of columns along the Y direction and a plurality of rows along the X direction, is described as

an example, but the disclosure is not limited to the example. For example, as illustrated in a modification example of FIG. 5, a plurality of coils 20 may be alternately arranged (staggered) each other and arranged in an oblique direction different from the X direction and the Y direction. In this case, similar to the exemplary embodiment described above, light emitting unit 26 may be disposed around each coil 20. Therefore, since a space between coils 10 is narrowed, heating distribution during cooking is made more uniform. More power can be sent in the same area during power transmission.

[0060] For example, a configuration of displaying the mountable region of a non-contact power receiving device 11 may also be provided by another method described below without displacing light emitting unit 26 around each coil 20. Specifically, for example, a configuration, in which the mountable region is displayed and shown in attached display unit 12, may be provided. A configuration, in which the mountable region is displayed and shown in an external display communicating with induction heating cooker 2, may be provided. That is, attached display unit 12 and an outside display may also be function as the guide units of the mountable region. These guide units may also be used in combination. Therefore, an installation place or the mountable region of induction heating cooker 2 can be appropriately set according to a specification of induction heating cooker 2 or preference of the user. As a result, convenience of a user can be further improved.

[0061] In the exemplary embodiment, a configuration, which is visually displayed and shown by light emitting units 16 and 26, is described as an example, but the disclosure is not limited to the example. For example, a configuration, in which a voice guidance unit or the like is provided and the user is guided to the mountable region by voice, may be provided. Therefore, for example, even a user having visual disability can conveniently use the configuration.

[0062] In the exemplary embodiment, the multi-coil configuration of layout free capable of mounting heating target 4 or the non-contact power receiving device 11 at an arbitrary position on top plate 8 is described as an example, but the disclosure is not limited to the example. For example, the mounting places (heating regions) of heating target 4 and the non-contact power receiving device 11 are determined in advance in a plurality of locations. The coil is provided corresponding to each mounting place that is set in advance. A configuration, in which the user mounts heating target 4 or the non-contact power receiving device 11 on an arbitrary position among a plurality of mounting places, may also be provided. In this case, a configuration, in which an operation unit configured of a liquid crystal, a segment display such as the LED, and the like provided corresponding to a region of each mounting place is lighted and the mountable region of the non-contact power receiving device 11 is shown, may also be provided. Therefore, since the number of coils 20 is reduced, the cost of entire induction heating cooker 2 can be reduced. The user can more easily discriminate the mounting place of the non-contact power receiving device.

[0063] In the exemplary embodiment, in the example of the flowchart of FIG. 3, a case where one coil 10a is heating before non-contact power receiving device 11 is mounted in step S2 is described as an example. That is, a case where heating target 4 is already place on top plate 8 is described as an example, but the disclosure is not limited to the example. For example, a case where there is no coil 10 being heated, that is, heating target 4 is not placed on top plate 8 may also be provided. In this case, first, in the temperature determination of step S3 illustrated in FIG. 3, controller 18 determines a temperature result of temperature detector 14 in all the regions. Controller 18 may perform light emission control of light emitting unit 16 in step S4 based on the determination result. In this case, the user mounts non-contact power receiving device 11 on top plate 8 based on mounting guide by light emission control of light emitting unit. Thereafter, heating target 4 is mounted on top plate 8 and heating control may be performed. Therefore, even in a case where a pan, a cooking material, or the like is placed on top plate 8, for example, after cooking with a high-temperature frying pan or another cooking equipment such as an oven after heating, the display can be placed in a low-temperature region and safely used.

[0064] In the exemplary embodiment, a case where one heating target 4 is disposed on top plate 8 is described as an example, but the disclosure is not limited to the example. For example, a plurality of heating targets 4 may also be disposed on top plate 8. Also in this case, the same control as the control described in step S3 of FIG. 3 may be individually performed.

[0065] In the exemplary embodiment, in step S2 illustrated in FIG. 3, a case where the temperature determination of step S3 is performed except a region in which coil 10a is determined being heated and the surrounding region thereof is described as an example, but the disclosure is not limited to the example. For example, in step S2 of FIG. 3, the temperature determination of step S3 may also be performed except only the region in which coil 10a is determined being heated, that is, the region including the surrounding region of coil 10a. In this case, the "surrounding region" is not limited to a size of the range illustrated in FIG. 4B and the like, may be a range of an arbitrary size. Therefore, in a case where heating power is low and a temperature is not so high in coil 10a, it is possible to take a wider place on which the non-contact power receiving device can be safely mounted.

[0066] In the exemplary embodiment, in step S1 of FIG. 3, in a case where a signal is transmitted to controller 18 by pressing a button of non-contact power receiving device 11 by the user is described as an example, but the disclosure is not limited to the example. For example, only step S2 to step S4 of FIG. 3 are performed and light emission of the light emitting unit may also be controlled by pressing the button provided in body unit 6 of induction

heating cooker 2 or the like. Therefore, step S1 of the flowchart illustrated in FIG. 3 can be omitted.

[0067] A configuration, in which communication unit 11a of non-contact power receiving device 11 automatically transmits a signal to controller 18 of body unit 6 when non-contact power receiving device 11 approaches body unit 6 instead of pressing the button, may also be provided. Therefore, the operation by the user is small and it can be used more easily.

[0068] Arbitrary exemplary embodiments among the exemplary embodiments described above are appropriately combined. Therefore, it is possible to achieve effects included in each exemplary embodiment.

[0069] As described above, the induction heating cooker of the disclosure includes a top plate on which a heating target and a non-contact power receiving device is mounted; and a plurality of coils that are disposed so that at least one coil exists directly under the heating target or the non-contact power receiving device under the top plate when the heating target or the non-contact power receiving device is mounted on an arbitrary position on the top plate, and induction-heats the heating target mounted on the top plate, or supply power to the non-contact power receiving device. The induction heating cooker may further include a temperature detector that detects a temperature of the top plate; and a guide unit that shows a region of which a temperature detected by the temperature detector is a predetermined temperature or less to a user as the mountable region of the non-contact power receiving device.

[0070] According to the configuration, the guide unit that shows the region of which the temperature of the top plate is a predetermined temperature or less to an arbitrary position in which the non-contact power receiving device is capable of being mounted on the top plate. Therefore, the non-contact power receiving device can be further reliably mounted on the region having a low temperature. As a result, it is possible to provide the induction heating cooker in which convenience of a user is improved.

[0071] The induction heating cooker of the discharge may include a controller that controls drive of the induction heating cooker. The controller may cause the guide unit to perform guidance when receiving a signal from the non-contact power receiving device. According to the configuration, guidance to the user can be performed by the guide unit at a desired timing. Therefore, convenience of a user is improved.

[0072] The controller of the induction heating cooker of the disclosure may have information of a size of the non-contact power receiving device and may cause the guide unit to guide the non-contact power receiving device to the mountable region based on the information of the size when receiving the signal from the non-contact power receiving device. According to the configuration, the mountable region of the non-contact power receiving device can be further reliably shown to the user. Therefore, convenience of a user is improved.

[0073] In the induction heating cooker of the disclosure, the guide unit may show other region corresponding to the coils during heating as the mountable region of the non-contact power receiving device. According to the configuration, an influence of the heating target that is induction-heated via the coils to the periphery by heating cooking can be reduced. Therefore, convenience of a user is improved.

[0074] The temperature detector of the induction heating cooker of the disclosure may be configured of a plurality of temperature sensors each corresponding to a different one of the plurality of coils. According to the configuration, individual temperature detection corresponding to each coil region can be performed. Therefore, the mountable region of the non-contact power receiving device can be further accurately set.

[0075] The induction heating cooker of the disclosure may further include a light emitting unit that is disposed in a periphery of each of the coils and emits light visibly through the top plate, and the light emitting unit may function as the guide unit. According to the configuration, the user can visually easily determine the mountable region of the non-contact power receiving device. Therefore, convenience of a user is further improved.

[0076] The induction heating cooker of the disclosure may further include a body unit that houses the plurality of coils and is disposed so as to support the top plate. The body unit may have an attached display unit that displays cooking information about cooking of the induction heating cooker, and the attached display unit may function as the guide unit. Therefore, convenience of a user is further improved.

[0077] The induction heating cooker of the disclosure may further include a display that is provided on the outside, and the display may function as the guide unit. According to the configuration, the heating target, the non-contact power receiving device, or the like can be further efficiently guided to the mountable region via the display disposed at an arbitrary place that the user can easily watch. Therefore, convenience of a user is improved.

INDUSTRIAL APPLICABILITY

[0078] According to the disclosure, a user can execute heating cooking and the like by mounting the heating target or the non-contact power receiving device at an arbitrary place. Therefore, it is useful for an application such as an induction heating cooker which is required for further convenience during cooking.

REFERENCE MARKS IN THE DRAWINGS

[0079]

2 induction heating cooker
4 heating target
6 body unit
8 top plate

10, 10a, 10b, 10c, 10d, 20 coil
11 non-contact power receiving device
11a communication unit
11b power receiving coil
12 attached display unit
14 temperature detector
16, 26 light emitting unit
18 controller

Claims

1. An induction heating cooker comprising:

a top plate on which a heating target or a non-contact power receiving device is mounted;
a plurality of coils that are disposed so that at least one coil exists directly under the heating target or the non-contact power receiving device under the top plate when the heating target or the non-contact power receiving device is mounted on an arbitrary position on the top plate, and induction-heats the heating target mounted on the top plate, or supply power to the non-contact power receiving device;
a temperature detector that detects a temperature of the top plate; and
a guide unit that shows a region of which a temperature detected by the temperature detector is a predetermined temperature or less to a user as a mountable region of the non-contact power receiving device.

2. The induction heating cooker of Claim 1, further comprising:

a controller that controls drive of the induction heating cooker,
wherein the controller causes the guide unit to perform guidance when receiving a signal from the non-contact power receiving device.

3. The induction heating cooker of Claim 2,
wherein the controller has information of a size of the non-contact power receiving device and causes the guide unit to guide the non-contact power receiving device to the mountable region based on the information of the size when receiving the signal from the non-contact power receiving device.

4. The induction heating cooker of Claim 1,
wherein the guide unit shows other region corresponding to coils during heating as the mountable region of the non-contact power receiving device.

5. The induction heating cooker of Claim 1,
wherein the temperature detector is configured of a plurality of temperature sensors each corresponding to a different one of the plurality of coils.

6. The induction heating cooker of Claim 1, further comprising:

a light emitting unit that is disposed in a periphery of each of the coils and emits light visibly through the top plate,
wherein the light emitting unit functions as the guide unit.

7. The induction heating cooker of Claim 1, further comprising:

a body unit that houses the plurality of coils and is disposed so as to support the top plate,
wherein the body unit has an attached display unit that displays cooking information about cooking of the induction heating cooker, and
wherein the attached display unit functions as the guide unit.

8. The induction heating cooker of Claim 1, further comprising:

a display that is provided on an outside,
wherein the display functions as the guide unit.

FIG. 1

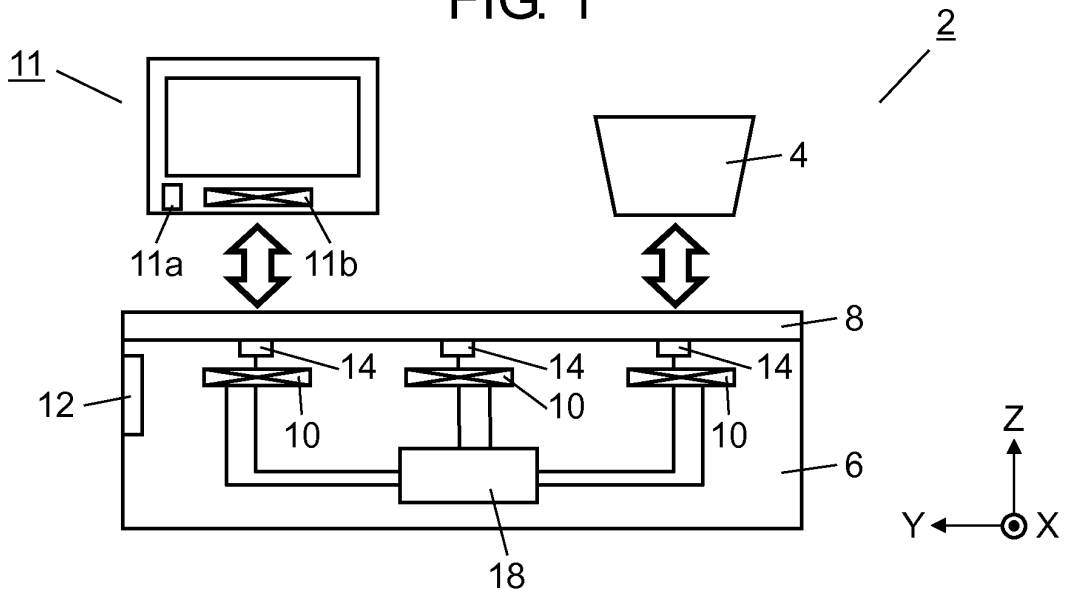


FIG. 2

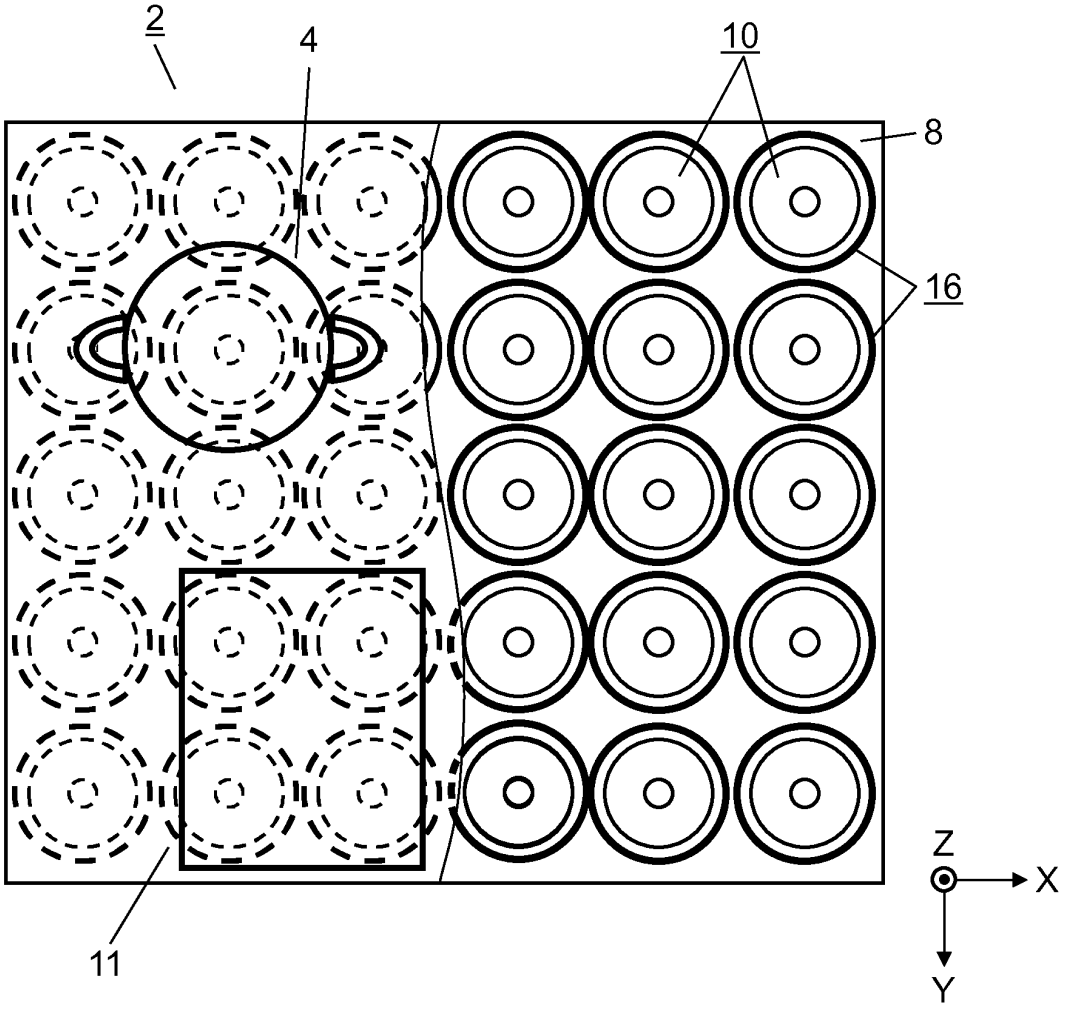


FIG. 3

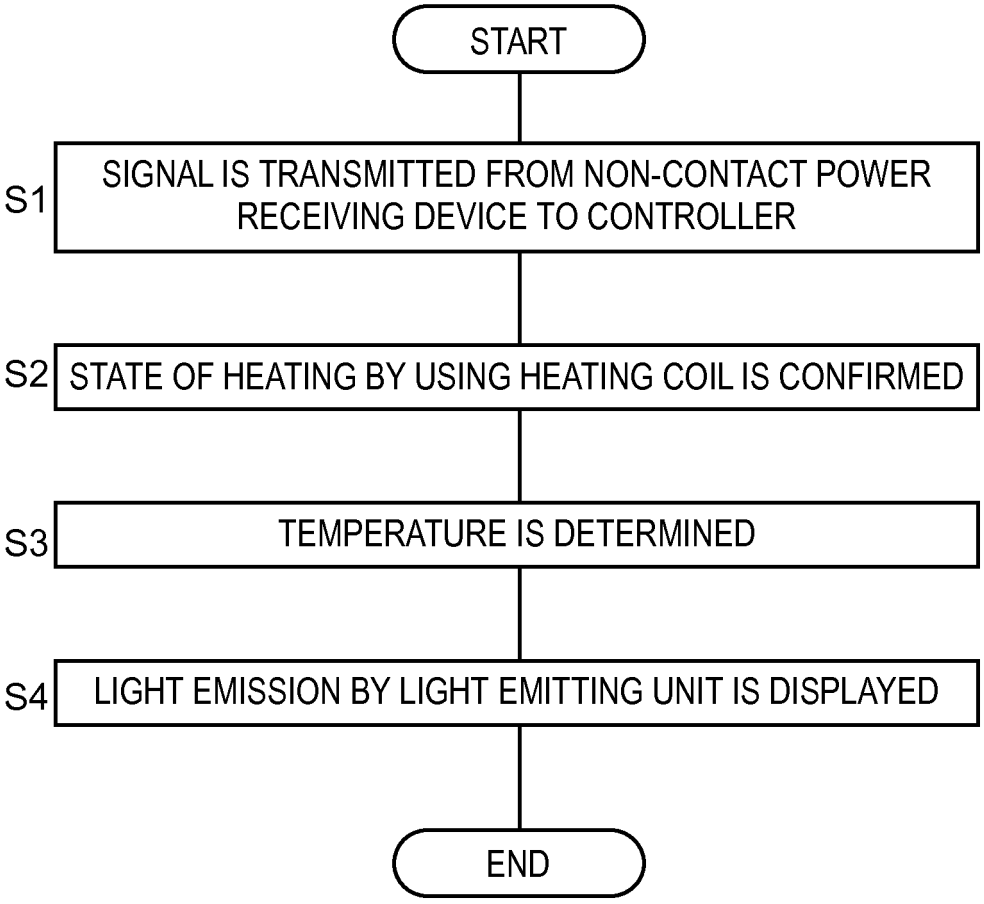

START
S1
SIGNAL IS TRANSMITTED FROM NON-CONTACT POWER RECEIVING DEVICE TO CONTROLLER
S2
STATE OF HEATING BY USING HEATING COIL IS CONFIRMED
S3
TEMPERATURE IS DETERMINED
S4
LIGHT EMISSION BY LIGHT EMITTING UNIT IS DISPLAYED
END

FIG. 4A

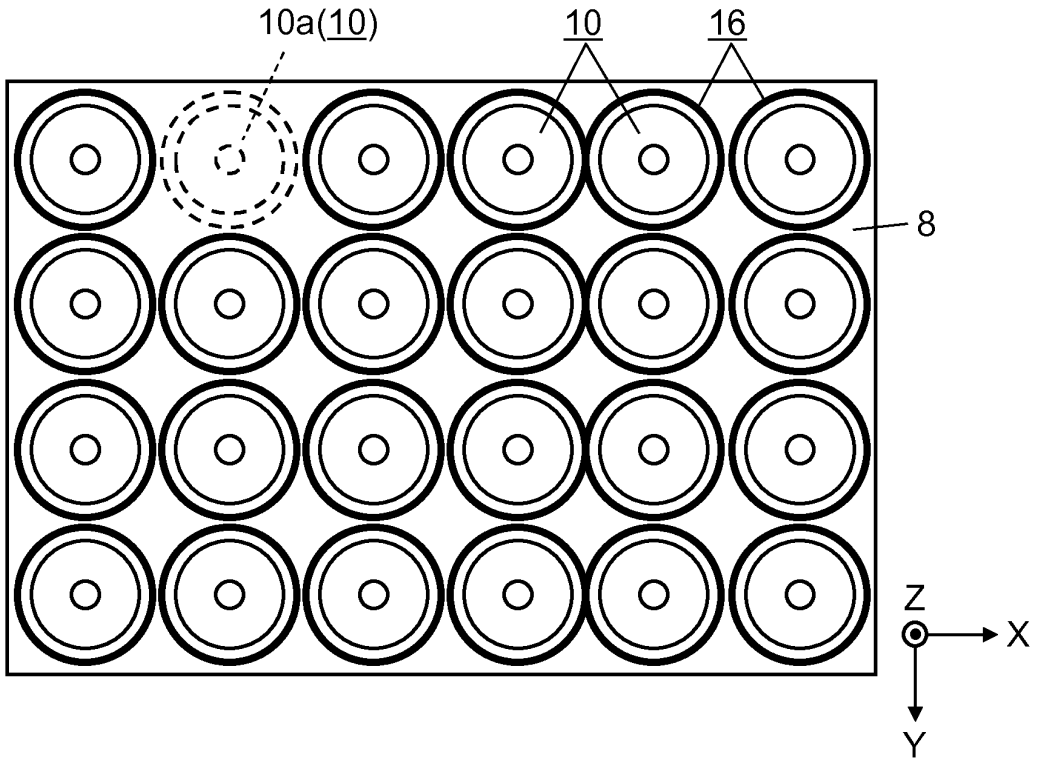


FIG. 4B

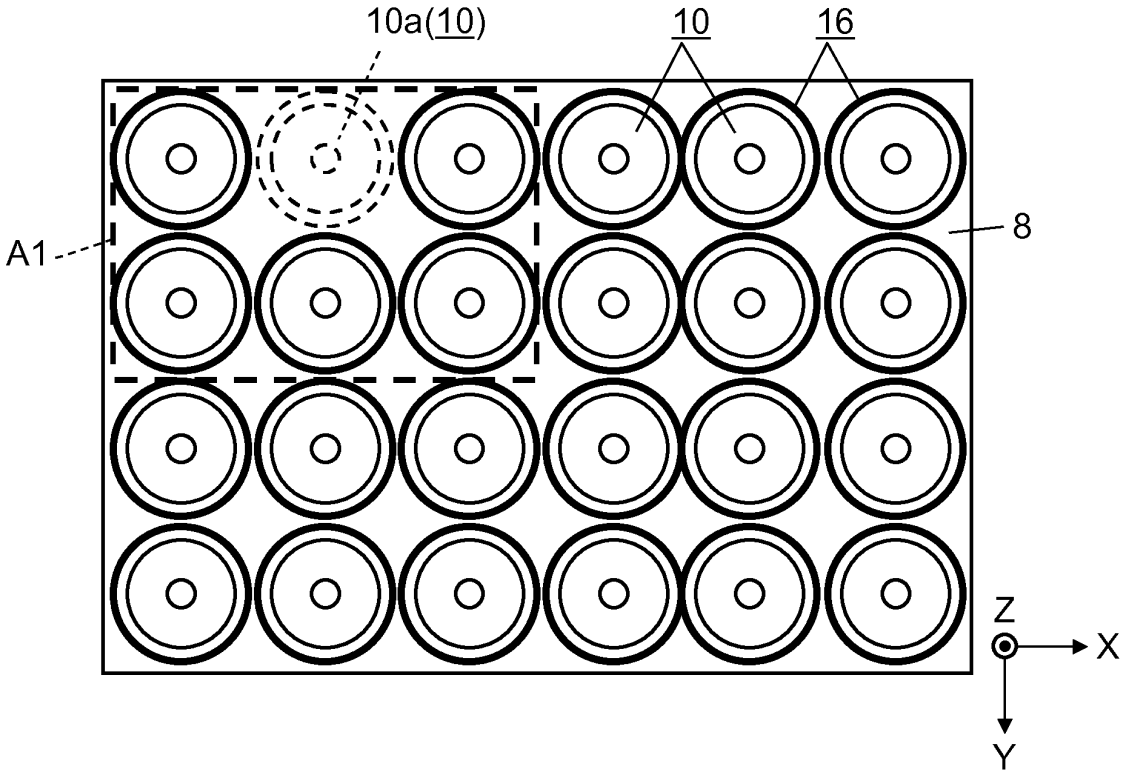


FIG. 4C

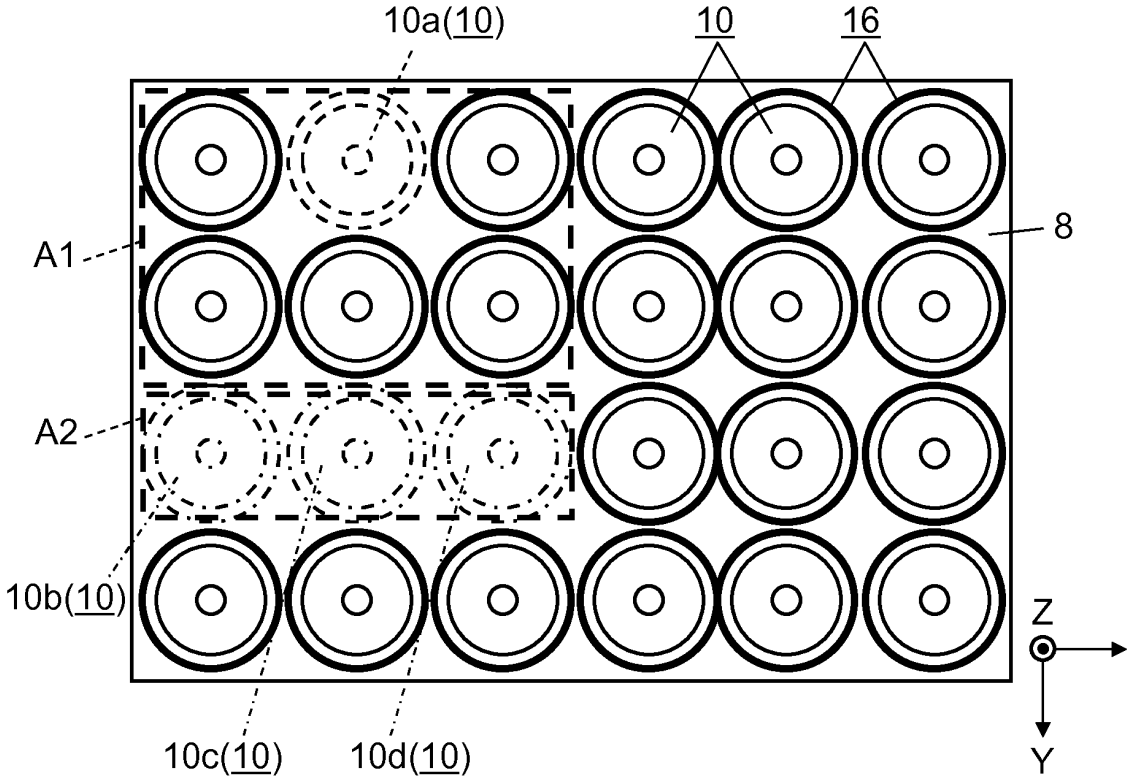

10a(10)
10
16
8
A1
A2
10b(10)
10c(10)
10d(10)
Z
Y

FIG. 4D

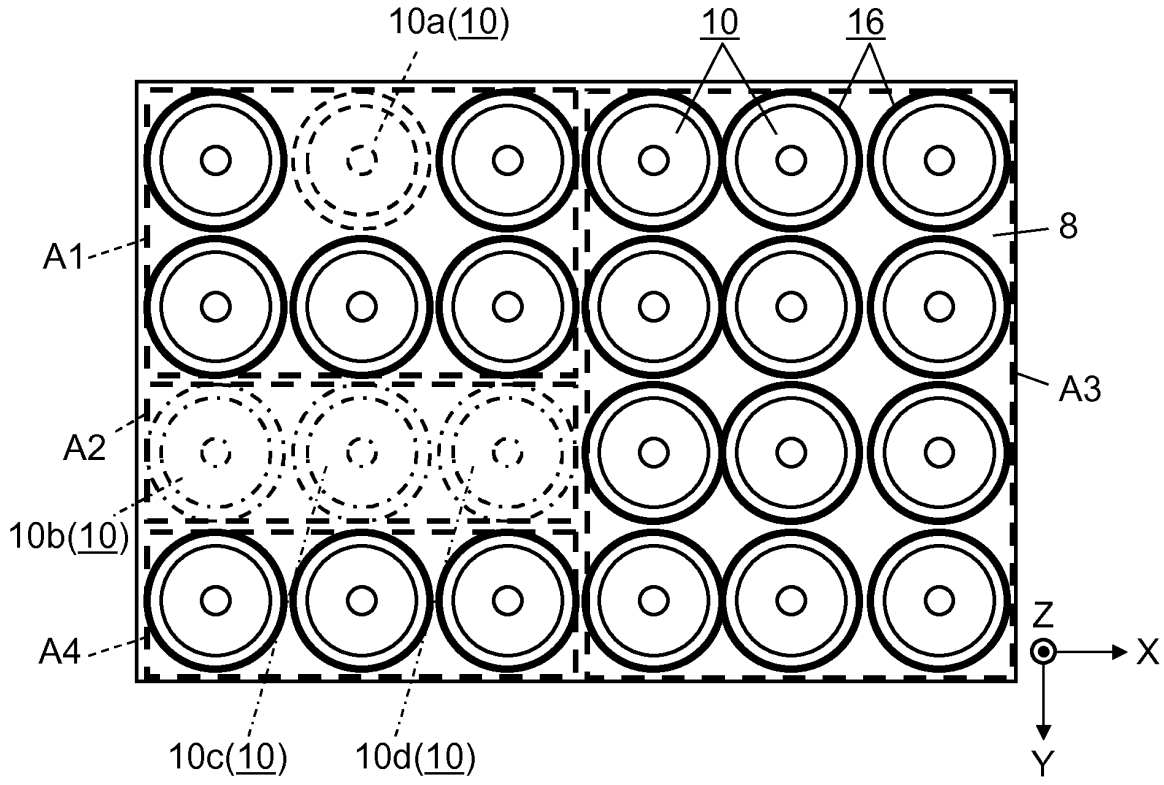
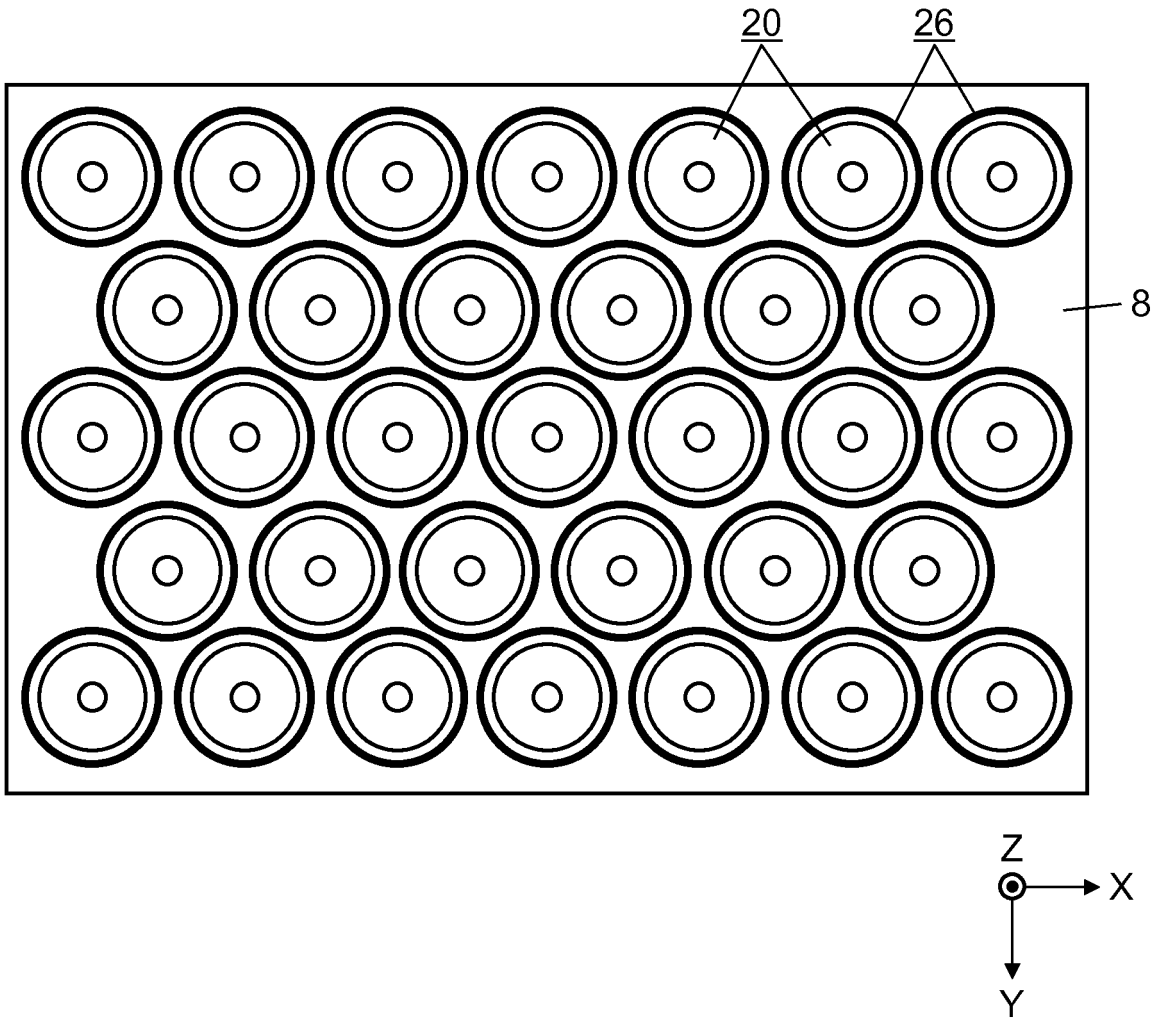

10a(10)
10
16
8
A1
A3
A2
10b(10)
A4
10c(10)
10d(10)
Z
X
Y

FIG. 5



INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2016/003638

A. CLASSIFICATION OF SUBJECT MATTER
H05B6/12(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)
H05B6/12

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Jitsuyo Shinan Koho 1922-1996 Jitsuyo Shinan Toroku Koho 1996-2016
Kokai Jitsuyo Shinan Koho 1971-2016 Toroku Jitsuyo Shinan Koho 1994-2016

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	JP 2009-165291 A (Mitsubishi Electric Corp.), 23 July 2009 (23.07.2009), paragraphs [0012], [0020], [0102] to [0109]; fig. 1, 10 (Family: none)	1-2,4-8 3
Y	JP 2009-238613 A (Mitsubishi Electric Corp.), 15 October 2009 (15.10.2009), paragraphs [0010] to [0014]; fig. 1 to 3, 5 (Family: none)	1-2,4-8
Y	JP 2011-015549 A (Toyota Motor Corp.), 20 January 2011 (20.01.2011), paragraphs [0120] to [0128]; fig. 22 (Family: none)	2

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

* Special categories of cited documents:
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"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
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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
11 October 2016 (11.10.16)	25 October 2016 (25.10.16)
Name and mailing address of the ISA/ Japan Patent Office 3-4-3,Kasumigaseki,Chiyoda-ku, Tokyo 100-8915,Japan	Authorized officer Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2016/003638

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 2014-044809 A (Panasonic Corp.), 13 March 2014 (13.03.2014), paragraphs [0025] to [0035]; fig. 1 to 3 & WO 2014/030315 A1 & DE 112013004163 T5	6
A	JP 2014-044819 A (Panasonic Corp.), 13 March 2014 (13.03.2014), paragraphs [0029] to [0057]; fig. 1, 13 to 14 & WO 2014/030314 A1 & DE 112013004166 T5	1-8

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 2013038694 A **[0006]**