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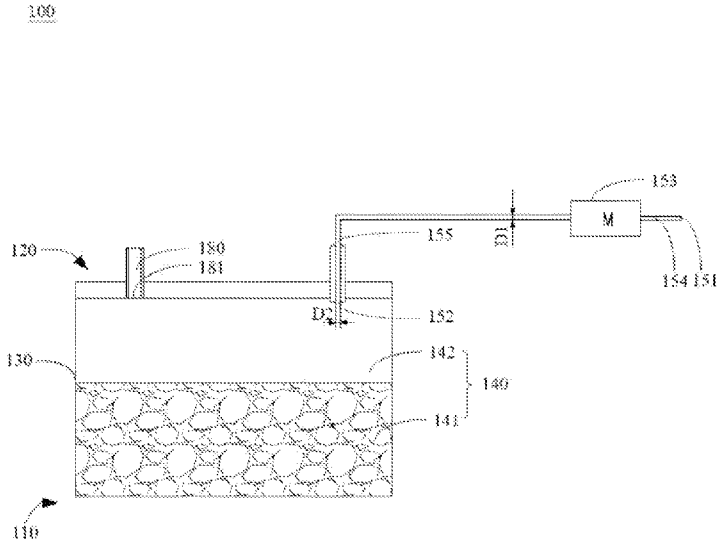

Figure 1

(57) Abstract: A cooking utensil (100,200) comprising: a pot body (110,210), inside which an inner pot (130,230) is arranged; a cover body (120,220) that is arranged on the pot body (110,210) in such a manner that the cover body (120,220) can be opened and closed, a cooking space (140) that comprises a food storing space (141) and a cavity space (142) above the food storing space (141) is formed between the cover body (120,220) and the inner pot (130,230) when the cover body (120,220) covers and closes the pot body (110,210); at least one air suction opening (151,251) that communicates with the exterior; at least one air inlet (152,252) that communicates with the cavity space (142); at least one air pump (153,253) that communicates with the at least one air inlet (152,252) and the at least one air suction opening (151,251); and a controller connected with the at least one air pump (153,253) to control the at least one air pump (153,253) to pump air into the cavity space (142) when it detects that the food in the food storing space (141) is in a boiling phase, which air can enter into contact with bubbles in the cavity space (142) so as to break them. The cooking utensil (100,200) can prevent spilling.

WO 2020/000898 A1

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A Cooking Utensil

Field of the Invention

The invention relates to the technical field of electrical home appliances, and more particularly, a cooking utensil.

Background of the Invention

Known cooking utensils (such as electrical rice cookers) generally have a high heating power in order to increase the speed of cooking. However, in practical use, when food is boiling while being heated by constant high power, a lot of bubbles will be produced, thus creating a spilling problem.

Therefore, it is necessary to propose a cooking utensil to solve at least partially the problems in the prior art.

Summary of the Invention

A series of simplified concepts are introduced in the "summary of the invention" section, which concepts will be further described in detail in the "embodiments" section. The "summary of the invention" section is not meant to try to define the key characteristics and essential technical features of the technical solutions claimed. Nor is it meant to try to determine the protection scope of the technical solutions claimed.

The invention provides a cooking utensil. The cooking utensil comprises a pot body, a cover body, at least one air suction opening, at least one air inlet, at least one air pump, and a controller. An inner pot is arranged inside the pot body. The cover body is arranged on the pot body in such a manner that the cover body can be opened and closed. When the cover body covers and closes the pot body, a cooking space is formed

between the cover body and the inner pot. The cooking space comprises a food storing space and a cavity space above the food storing space. The air suction opening communicates with the exterior. The at least one air inlet communicates with the cavity space. The at least one air pump communicates with the at least one air inlet and the at least one air suction opening. The controller is connected with the at least one air pump to control the at least one air pump to pump air into the cavity space when it detects the food in the food storing space is in a boiling phase, which air can enter into contact with the bubbles in the cavity space so as to break them.

With a cooking utensil according to the invention, during cooking, the controller can control the air pump(s) to suck in air through the air suction opening(s) and pumps the air sucked in into the cavity space through the air inlet(s) when it detects that the food in the food storing space is in a boiling phase. Generally, there is a difference in temperature between the pumped air and the bubbles produced in the cavity space. As a result, the pumped air, after entering the cavity space and entering into contact with the bubbles accumulated inside the cavity space, can turn the steam inside the bubbles into liquid and shrink the bubbles so as to break them, thus preventing spilling. Even in the case of fast cooking with high heating power, spilling can also be prevented. When there are multiple air inlets and/or air suction openings, air can be pumped into the cavity space at multiple locations. When more than one air pump are provided, the air pumps can be arranged in series, or in parallel. Thus, the flow rate of the air pumped into the cavity space can be adjusted based on actual needs.

Optionally, the operating pressure of the at least one air pump is higher than or equal to 0PA and lower than 10KPA. The applicant has discovered that, with the operating pressure of the air pump(s) in this range, not only can exterior air be pumped into the cavity space so as to

make the pumped air enter into contact with the bubbles produced in the cavity space to break them, but also the negative effect due to an excessive operating pressure of the air pump(s) can be avoided.

Optionally, the air pumping flow rate of the at least one air pump is higher than or equal to 0.3LPM and lower than or equal to 12LPM, preferably higher than or equal to 0.5LPM and lower than or equal to 6LPM. The applicant has discovered that, with the air pumping flow rate (no-load) in this range, not only can relatively good anti-spilling results be achieved, but also the air pump(s) will not have an excessive size, is suitable for installation in mid- or small-sized electrical home appliances like the cooking utensil, and will not be costly either.

Optionally, the inner diameter of the at least one air inlet is larger than or equal to 0.5mm, preferably larger than or equal to 0.8mm and smaller than or equal to 8mm. The applicant has discovered that, with the inner diameter of the air inlet(s) in this range, the exterior air that enters the cavity space through the air inlet(s) has relatively good strength and relatively large coverage, which is more conducive to its entering into contact with the bubbles in the cavity space so as to break them.

Optionally, the at least one air pump is arranged in the cover body. Thus, the communication between the air pump(s) and the air suction opening(s) and the air inlet(s) arranged in the cover body is facilitated.

Optionally, the cover body comprises a lining cover and a decorative cover arranged above the lining cover, an accommodating space being formed between the lining cover and the decorative cover. The at least one air pump is arranged in the accommodating space and spaced apart from the lining cover and the decorative cover, preferably through at least one air pump support. Thus, during operation the air pump(s) can be

prevented from entering into direct contact with the lining cover and the decorative cover to create noises.

Optionally, the at least one air pump is arranged in the pot body. Compared to the embodiment in which the air pump(s) is arranged in the cover body, excessively high temperature of the environment surrounding the air pump due to the accumulation of steam below the cover body, which affects the life of the air pump(s) and increases the use cost, can be prevented.

Optionally, the at least one air pump is arranged in a front end or a back end of the pot body and spaced apart from an inner pot heating device. Thus, the temperature of the environment surrounding the air pump(s) can be prevented from being too high so as to affect the life of the air pump(s), thus reducing replacement and maintenance costs.

Optionally, the at least one air pump is fixed on a base of the pot body, and spaced apart from the rest of the pot body, preferably through at least one air pump support. Thus, during operation the air pump(s) can be prevented from entering into direct contact with the rest of the pot body to create noises.

Optionally, at least part of the at least one air pump support is made of an elastic material. Thus, the noises created due to vibrations of the air pump(s) during operation are further reduced.

Optionally, the at least one air pump support, for example in the form of a "Ω", comprises: a fixing part connected to the lining cover or the base; and a supporting part connected to the fixing part and supporting the at least one air pump. The form "Ω" facilitates the installation of the air pump(s) in the air pump support(s).

Optionally, the cover body is provided with a steam passage, one end of which is provided with a steam inlet that communicates with the cavity space and the other end of which is provided with a steam outlet that communicates with the exterior. The distance between the steam inlet and the at least one air inlet is smaller than or equal to 180mm. The applicant has discovered that, with the distance between the steam inlet and the air inlet(s) in this range, anti-spilling results are better.

Optionally, a dispersing cover that covers the at least one air inlet is arranged at the at least one air inlet. The dispersing cover is provided with one or more through-holes.

Optionally, at least one of the through-holes of the dispersing cover is oriented towards the steam inlet. Thus, at least part of the exterior air can be directly blown towards the steam inlet. Once spilling tends to happen at the steam inlet, the exterior air directly blown towards the steam inlet can rapidly enter into contact with the bubbles at the steam inlet so as to break them. Therefore, anti-spilling can be achieved more rapidly.

Optionally, at least one of the at least one air inlet and the at least one air suction opening is arranged on the cover body. Thus, the arrangement of the air transfer lines is facilitated

Description of the Drawings

The following figures of the invention, as part of the invention, are used herein to facilitate understating of the invention. The embodiments illustrated in the figures and the description thereof are used to explain the device of the invention and its principle. In the figures:

Figure 1 is a schematic diagram of a cooking utensil provided by the

invention;

Figure 2 is a schematic sectional view of the cover body of a cooking utensil according to an embodiment of the invention;

Figure 3 is a schematic view in perspective of the cover body illustrated in Figure 2, with the decorative cover removed; and;

Figure 4 is a schematic sectional view of a cooking utensil according to another embodiment of the invention.

Detailed Description of the Embodiments

In the description that follows, a lot of details are given for a more thorough understanding of the invention. However, as is obvious to persons skilled in the art, the invention can be implemented without one or more of those details. In other examples, to avoid confusion with the invention, certain technical features known in the art are not described.

To understand the invention thoroughly, detailed structures will be provided in the following description, so as to illustrate the invention. Of course, the implementation of the invention is not limited to specific details well known to persons skilled in the art. Preferred embodiments of the invention are described as follows. But in addition to this detailed description, there can be other embodiments of the invention. It should not be construed to be limited to the embodiments mentioned herein.

The invention provides a cooking utensil. The cooking utensil can be an electrical rice cooker, an electrical pressure cooker, or another electrical heating utensil. In addition, the cooking utensil can have functions other than rice cooking, such as porridge making and soup making.

Figure 1 shows a schematic diagram of a cooking utensil 100 provided by the invention. To be concise, Figure 1 shows only schematically a partial structure of the cooking utensil 100.

As shown in Figure 1, the cooking utensil 100 comprises a pot body 110. The pot body 110 can substantially take the shape of a cuboid with rounded corners, a circular cylinder, or any other appropriate shape. An inner pot 130, substantially taking the shape of a circular cylinder or any other appropriate shape, is arranged inside the pot body 110. The inner pot 130 can be freely placed into an inner pot receiving part of the pot body 110 or taken out from the same so as to facilitate the cleaning of the inner pot 130. The inner pot 130 is used to store the food to be cooked, such as rice and soup. The inner pot 130 has a top opening at its top part. A user can place the food to be cooked inside the inner pot 130 through the top opening, or to take cooked food out of the inner pot 130 through the top opening.

An inner pot heating device (not shown) for heating the inner pot 130 is also arranged in the pot body 110. The inner pot heating device can heat the inner port 130 from the bottom and/or the side of the inner port 130. The inner pot heating device can be an electrical heating tube, or a induction heating device such as an electric-magnetic coil.

As shown in Figure 1, a cover body 120 is arranged on the pot body 110. The shape of the cover body 120 substantially corresponds to that of the pot body 110. For example, the cover body 120 can be of the shape of a cuboid with rounded corners. The cover body 120 is arranged on the pot body 110 in such a manner that it can be opened and closed so as to cover and close the entire top of the pot body 110 or at least the inner pot 130 of the pot body 110. Specifically, in the present embodiment, the cover body 120 can be arranged, for example in a hinged manner, on the pot body

110, such that it can pivote between a maximum open position and a closed position.

When the cover body 120 covers and closes the pot body 110, a cooking space 140 is formed between the cover body 120 and the pot body 110 (specifically, between the cover body 120 and the inner pot 130 of the pot body 110). The cooking space 140 comprises a food storing space 141 and a cavity space 142. Specifically, the food storing space 141 denotes the space in which food is actually placed. The cavity space 142 is located above the food storing space 141. In other words, when the cover body 120 covers and closes the pot body 110, the cavity space 142 is the space located between the upper surface of the food and the cover body 120. There is no strict boundary between the food storing space 141 and the cavity space 142. Their volumes will change as a function of the specific variations in the volume of the food.

The cooking utensil 100 is provided with one or more air suction openings 151 that communicate with the exterior environment. The air suction opening(s) 151 can be arranged at any appropriate location(s) of the cooking utensil 100. Specifically, in an embodiment of the invention, as shown in Figures 2 and 3, the air suction opening 151 is arranged on the upper surface of the cover body 120. More specifically, as shown in Figure 2, the cover body 120 comprises a lining cover 121. The lining cover 121 is provided with a decorative cover 122 at its upper side (or outer side). The lining cover 121 is provided with an inner cover 123 at its lower side (or inner side). The inner cover 123 can be a removable inner cover. The air suction opening 151 is arranged on the decorative cover 122. Of course, the air suction opening 151 can be arranged at any other appropriate location of the cover body 120. For example, the air suction opening 151 can be arranged on a side surface of the cover body 120. In addition, the air suction opening 151 can also be arranged at any

appropriate location of the pot body 110.

An air inlet 152 that communicates with the cavity space 142 is also arranged in the cooking utensil 100. The air inlet 152 can be arranged at any appropriate location of the cooking utensil 100. Specifically, in an embodiment of the invention, as shown in Figure 2, the air inlet 152 is arranged on the cover body 120. More specifically, the air inlet 152 is arranged on the inner cover 123 of the cover body 120. Of course, the air inlet 152 can also be arranged in the pot body 110. For example, the air inlet 152 can be arranged on the inner pot 130 of the pot body 110.

An air pump 153 is also arranged in the cooking utensil 100 for pumping air into the cooking space (specifically, the cavity space). The air pump 153 communicates with the air suction opening 151 and the air inlet 152. Specifically, the inlet end of the air pump 153 communicates with the air suction opening 151, and the outlet end of the air pump 153 communicates with the air inlet 152. More specifically, the air pump 153 communicates with the air suction opening 151 via an air suction line 154. For example, the air suction line 154 can be made of an elastic material such as silicone. One end of the air suction line 154 is inserted to the inlet end of the air pump 153, and the other end of the air suction line 154 communicates with, for example, is inserted to, the air suction opening 151. The air pump 153 communicates with the air inlet 152 via the air inlet line 155. For example, the air inlet line 155 can be made of an elastic material such as silicone. One end of the air inlet line 155 is inserted to the outlet end of the air pump 153, and the other end of the air inlet line 155 communicates with, for example, is inserted to, the air inlet 152. Therefore, the air suction opening 151, the air suction line 154, the air pump 153, the air inlet line 155, and the air inlet 152 together form an air transfer system for sucking air from outside the cooking utensil 100 (such as exterior cold air) into the cavity space 142.

A controller (not shown) is also provided in the cooking utensil 100. The controller can be arranged in the cover body 120, or can be arranged in the pot body 110. The controller is connected with the air pump 153. During cooking, when the food in the food storing space 141 is in a boiling phase, viscous substances such as starch inside the food being cooked will separate out into the water and wrap around steam, forming a lot of bubbles. Those bubbles will accumulate in large quantities in the cavity space 142 above the food storing space 141. The controller controls the air pump 153 to pump air into the cavity space 142 when it detects the food in the food storing space 141 being in a boiling phase. Specifically, the controller controls the air pump 153 to suck in air through the air suction opening 151, and transfer the air sucked in into the cavity space 142 through the air inlet 152. Generally there is a difference in temperature between the pumped air and the bubbles produced inside the cavity space 142. As a result, after the pumped air enters the cavity space 142 and enters into contact with the bubbles accumulated inside the cavity space 142, it can turn the steam inside the bubbles into liquid and shrink the bubbles so as to break them, so as to prevent spilling. Spilling can be prevented even in the case of quick cooking at high heating power.

Optionally, there can be multiple air suction openings 152, so that air can be pumped into the cavity space 142 at multiple locations. Further optionally, the multiple air suction openings 152 are distributed uniformly so as to be able to pump air into the cavity space 142 uniformly.

Optionally, there can be one or more air pumps 153. When more than one air pump 153 are provided, the air pumps 153 can be arranged in series, or in parallel. Thus, the flow rate of the air pumped into the cavity space 142 can be adjusted based on actual needs.

Optionally, the air pumping flow rate (no-load rate) of the air pump

153 is higher than or equal to 0.3LPM and lower than or equal to 12LPM. Preferentially, the air pumping flow rate (no-load rate) of the air pump 153 is higher than or equal to 0.5LPM and lower than or equal to 6LPM. The higher the flow rate of the air pump 153, the bigger the size of the air pump 153, the higher the cost, and the bigger the required installation space. The applicant has discovered that, with the air pumping flow rate (no-load rate) of the air pump 153 in above mentioned ranges, not only can relatively good anti-spilling results be achieved, but also the air pump 153 will not have an excessive size, is suitable for installation in mid- or small-sized electrical home appliances like the cooking utensil 100, and will not be costly either.

The air pump 153, during operation, needs to overcome the pressure inside the cavity space 142, and needs to have a certain flow rate so as to pump exterior air into the cavity space 142. Therefore, the air pump 153 requires a certain operating pressure. But, the higher the air pump 153's operating pressure, the higher the load, which means the bigger the air pump 153's current, and the higher the potential safety risk. In addition, under a high load, air cannot be removed, which greatly reduces the life of the air pump 153. Therefore, the operating pressure of the air pump 153 needs to be controlled within a suitable range. Optionally, the operating pressure of the air pump 153 is higher than or equal to 0PA and lower than 10KPA. The applicant has discovered that, with the operating pressure of the air pump 153 in this range, not only can exterior air be pumped into the cavity space 142 so as to make the pumped air enter into contact with the bubbles produced in the cavity space 142 to break them, but also the negative effect due to an excessive operating pressure of the air pump 153 can be avoided.

In addition, the line size of the air inlet line 155 and the size of the air inlet 152 have a significant impact on the strength and coverage of the

exterior air entering into the cavity space 142. Given a certain air pumping flow rate, the smaller the line of the air inlet line 155 and the air inlet 152, the higher the speed of the air flow, and the bigger the coverage of the exterior air entering into the cavity space 142, which will also increase the load pressure of the air pump 153 and reduces the flow rate. Optionally, the inner diameter D1 of the air inlet line 155 and/or the inner diameter D2 of the air inlet 152 is larger than or equal to 0.5mm. Optionally, the inner diameter D1 of the air inlet line 155 and/or the inner diameter D2 of the air inlet 152 is larger than or equal to 0.8mm and smaller than or equal to 8mm. The applicant has discovered that, with the inner diameter D1 of the air inlet line 155, the inner diameter D2 of the air inlet 152 in this range, the exterior air that enters the cavity space 142 through the air inlet 152 has relatively good strength and relatively large coverage, which is more conducive to its entering into contact with the bubbles in the cavity space 142 so as to break them.

The air pump 153 can be arranged at any appropriate location of the cooking utensil 100. In an embodiment of the invention, as shown in Figures 2 and 3, the air pump 153 is arranged in the cover body 120 so as to communicate with the air suction opening 151 arranged in the cover body 120 via the air suction line 154, and communicate with the air inlet 152 arranged in the cover body 120 via the air inlet line 155. Specifically, the air pump 153 is arranged in the accommodating space between the lining cover 121 and the decorative cover 122. The air pump 153 is fixed to the lining cover 121 and spaced apart from the lining cover 121 and the decorative cover 122 via an air pump support 160, so as to prevent the air pump 153 from entering into direct contact with the lining cover 121 and the decorative cover 122 during operation to create noises. More specifically, the air pump support 160 can comprise a supporting part that supports the air pump 153 and a fixing part that is fixed to the lining

cover 121. The fixing part renders it unnecessary for the air pump 153 to enter into direct contact with the lining cover 121 and the decorative cover 122. In the illustrated embodiment, the air pump support 160 is configured to be in the form of a "Ω." It should be noted that, the form of the air pump support 160 is not limited to the illustrated embodiment. For example, in other embodiments of the invention, the supporting part of the air pump support 160 can also be configured to be in a closed form such as a circular ring.

There can be one or more air pump supports 160. When there are multiple air pump supports 160, the multiple air pump supports 160 can be arranged at an equal interval, so that each air pump support 160 is under uniform stress. Of course, the multiple air pump supports 160 can also be arranged at unequal intervals. The air pump support 160 can be at least partially made of an elastic material. For example, in an embodiment of the invention, the air pump support 160 can be entirely made of an elastic material such as rubber or silicone. In another embodiment of the invention, one part of the air pump support 160 can be made of an elastic material such as rubber or silicone, and another part of the air pump support 160 can be made of a material such as plastic or metal. With the air pump support 160 at least partially made of an elastic material, the noises produced due to vibrations of the air pump 153 during operation can be further reduced.

In another embodiment of the invention, as shown in Figure 4, the air pump 253 of a cooking utensil 200 can be arranged in the pot body 210, so as to remedy the drawbacks of the embodiment in which the air pump is arranged in the cover body: the temperature in the environment around the air pump could be too high due to the accumulation of steam below the cover body, accordingly the life of the air pump could be affected and the use cost could be increased. Specifically, the air pump

253 can be arranged at the front end of the pot body 210. It should be noted that the terms "front" and "back" used herein are in reference to the position of a user when using the cooking utensil. Specifically, the direction of the cooking utensil facing the user is defined as the "front" and the opposite direction is defined as the "back." The air pump 253 can be arranged in the front end part of the space between the outer housing of the pot body 210 and the inner pot receiving part or the inner port 230, and spaced apart from the inner pot heating device. Of course, the air pump 253 can also be arranged at the back end of the pot body 210 and spaced apart from the inner port heating device. Arranging the air pump 253 at the front end or back end of the pot body 210 and having it be spaced apart from the inner pot heating device can prevent the temperature of the environment surrounding the air pump 253 from being too high so as to affect the life of the air pump 253, thus reducing replacement and maintenance costs. Optionally, the air pump 253 can also be fixed inside the pot body 210, for example, on the base of the pot body 210, and spaced apart from the rest of the pot body 210, through an air pump support 260, so as to prevent the air pump 253 from entering into direct contact with the rest of the pot body 210 during operation and creating noises.

It should be noted that, when the air pump 253 is arranged inside the pot body 210, the air suction line 254 can extend from the cover body 220 into the pot body 210, to facilitate the communication between the air suction opening 251 arranged in the cover body 220 and the air pump 253 arranged in the pot body 210. Specifically, the back end of the cover body 220 and the back end of the pot body 210 are connected in a pivotable manner, and the air suction line 254 extends into the pot body 210 through the junction between the cover body 220 and the pot body 210. Thus, the arrangement of the air suction line 254 is facilitated. Conversely,

the air inlet line 255 can extend from the pot body 210 into the cover body 220, so as to facilitate the communication between the air inlet 252 arranged in the cover body 220 and the air pump 253 arranged in the pot body 210. Specifically, the back end of the cover body 220 and the back end of the pot body 210 are connected in a pivotable manner, and the air inlet line 255 extends into the pot body 210 through the junction between the cover body 220 and the pot body 210. Thus, the arrangement of the air inlet line 255 is facilitated.

Referring back to Figures 1 to 3, the cover body 120 is provided with a steam passage 180 to allow the gas inside the cavity space 142 to flow outside the cooking utensil 100. One end of the steam passage 180 is provided with a steam inlet 181 that communicates with the cavity space 142. The other end of the steam passage 180 is provided with a steam outlet 182 that communicates with the exterior. As explained above, the air pumped by the air pump 153, after entering the cavity space 142, can turn the steam inside the bubbles accumulated inside the cavity space 142 into liquid and shrink the bubbles so as to break them. The pumped air, after hitting the bubbles, can be vented outside via the steam inlet 181 through the steam passage 180, taking away part of the heat. Thus, the production of bubbles can be inhibited, and pressure can be reduced, further preventing spilling.

The air inlet 152 should be arranged as close to the steam inlet 181 as possible. Optionally, the distance between the steam inlet 181 and the air inlet 152 is smaller than or equal to 180mm. For example, the air inlet 152 can overlap with the steam inlet 181. Or, for example, the distance between the steam inlet 181 and the air inlet 152 is 150mm. The applicant has discovered that, with the distance between the steam inlet 181 and the air inlet 152 in the above mentioned ranges, anti-spilling results are relatively good.

Optionally, as shown in Figure 2, a dispersing cover 170 that covers the air inlet 152 is arranged at the air inlet 152. In the illustrated embodiment, as shown in Figures 2 and 4, the dispersing cover 170 is configured to protrude towards the cooking space 140 or the cavity space 142. Of course, the dispersing cover 170 can also be configured to recess towards the direction away from the cooking space 140 or the cavity space 142. The dispersing cover 170 is provided with one or more through-holes 171. The dispersing cover 170 can be integrally formed with the inner cover 123. Alternatively, the dispersing cover 170 and the inner cover 123 can be separate components and the dispersing cover 170 is fixed to the inner cover 123 or the air inlet 152 by thread engagement, threaded fasteners, or any other appropriate means.

When the dispersing cover 170 is provided with multiple through-holes 171, the multiple through-holes 171 can inject the air at the air inlet 152 into the cavity space 142 in a dispersed manner. This can, on one hand, prevent the air from being injected into the cavity space 142 in a concentrated manner so as to produce a recess on the surface of the food being cooked, on the other hand, the air can enter into contact with the bubbles produced inside the cavity space 142 on a larger surface to break more bubbles and prevent spilling. Further, this can prevent the bubbles produced during cooking from entering the air inlet line 155 through the air inlet 152, thus avoiding problems of bad smells and cleaning. The multiple through-holes 171 can be arranged on the dispersing cover 170 uniformly.

When the dispersing cover 170 is provided with one or more through-holes 171, optionally, at least one of the through-holes 171 is oriented towards the steam inlet 181. Generally, the bubbles produced inside the cavity space 142 tend to move towards the steam inlet 181. With at least one of the through-holes 171 of the dispersing cover 170

oriented towards the steam inlet 181, at least part of the exterior air can be directly blown towards the steam inlet 181. Once spilling tends to happen at the steam inlet 181, the exterior air directly blown towards the steam inlet 181 can rapidly enter into contact with the bubbles at the steam inlet 181 so as to break them. Therefore, anti-spilling can be achieved more rapidly.

Unless otherwise defined, the technology and scientific terms used herein have the same meanings as those commonly understood by persons skilled in the art. Terms used herein are merely to describe particular objectives of implementation and not to limit the invention. Terms such as “part”, “component”, “element” and the like used herein can not only denote a single element, but also the combination of multiple elements. Terms such as “mounted” and “arranged” used herein can not only denote that a part is directly attached to another part, but also that a part is attached to another part via an intermediate part. Features described in one embodiment herein can be applied, separately or in combination with other features, to another embodiment, unless inapplicable or otherwise specified.

While the invention has been described through the above embodiments, it should be understood that, the above embodiments are merely used as examples and for purposes of illustration, rather than to limit the invention to the scope of the embodiments described. In addition, persons skilled in the art can understand that, the invention is not limited to the above embodiments, and can be subject to more variations and modifications based on the invention’s teachings, which all fall within the scope of protection claimed by the invention. The scope of protection of the invention is delimited by the attached claims and the scope of their equivalents.

Claims

1. A cooking utensil (100/200) comprising:

a pot body (110/210), inside which an inner pot (130/230) is arranged;

a cover body (120/220) that is arranged on the pot body (110/210) in such a manner that the cover body (120/220) can be opened and closed, a cooking space (140) that comprises a food storing space (141) and a cavity space (142) above the food storing space (141) is formed between the cover body (120/220) and the inner pot (130/230) when the cover body (120/220) covers and closes the pot body (110/210);

at least one air suction opening (151/251) that communicates with the exterior;

at least one air inlet (152/252) that communicates with the cavity space (142);

at least one air pump (153/253) that communicates with the at least one air inlet (152/252) and the at least one air suction opening (151/251); and

a controller connected with the at least one air pump to control the at least one air pump to pump air into the cavity space (142) when it detects that the food in the food storing space (141) is in a boiling phase, which air can enter into contact with bubbles in the cavity space (142) so as to break them.

2. The cooking utensil (100/200) according to claim 1, wherein an operating pressure of the at least one air pump (153/253) is higher than or equal to 0PA and lower than 10KPA.

3. The cooking utensil (100/200) according to anyone of preceding claims, wherein an air pumping flow rate of the at least one air pump (153/253) is higher than or equal to 0.3LPM and lower than or equal to 12LPM, preferably higher than or equal to 0.5LPM and lower than or equal to 6LPM.

4. The cooking utensil (100/200) according to anyone of preceding claims, wherein an inner diameter of the at least one air inlet (152/252) is larger than or equal to 0.5mm, preferably larger than or equal to 0.8mm and smaller than or equal to 8mm.

5. The cooking utensil (100) according to anyone of preceding claims, wherein the at least one air pump (153) is arranged in the cover body (120).

6. The cooking utensil (100) according to claim 5, wherein the cover body (120) comprises a lining cover (121) and a decorative cover (122) arranged above the lining cover (121), an accommodating space being formed between the lining cover (121) and the decorative cover (122) and wherein the at least one air pump (153) is arranged in the accommodating space and spaced apart from the lining cover (121) and the decorative cover (122), preferably through at least one air pump support (160).

7. The cooking utensil (200) according to anyone of claims 1 to 4, wherein the at least one air pump (253) is arranged in the pot body (210).

8. The cooking utensil (200) according to claim 7, wherein the at least one air pump (253) is arranged in a front end or a back end of the pot body (210) and spaced apart from an inner pot heating device.

9. The cooking utensil (200) according to claim 7 or 8, wherein the at least one air pump (253) is fixed on a base of the pot body (210), and

spaced apart from the rest of the pot body (210), preferably through at least one air pump support (260).

10. The cooking utensil (100/200) according to claim 6 or 9, wherein at least part of the at least one air pump support (160/260) is made of an elastic material.

11. The cooking utensil (100/200) according to claim 6 or 9, wherein the at least one air pump support (160/260), for example in the form of a "Ω", comprises:

a fixing part connected to the lining cover (121) or the base; and

a supporting part connected to the fixing part and supporting the at least one air pump (153/253).

12. The cooking utensil (100/200) according to anyone of preceding claims, wherein the cover body (120/220) is provided with a steam passage (180), one end of which is provided with a steam inlet (181) that communicates with the cavity space (142), and the other end of which is provided with a steam outlet (182) that communicates with the exterior, the distance between the steam inlet (181) and the at least one air inlet (152/252) being smaller than or equal to 180mm.

13. The cooking utensil (100/200) according to claim 12, wherein a dispersing cover (170) that covers the at least one air inlet (152/252) is arranged at the at least one air inlet (152/252), the dispersing cover (170) being provided with one or more through-holes (171).

14. The cooking utensil (100/200) according to claim 13, wherein at least one of the through-holes (171) is oriented towards the steam inlet (181).

15. The cooking utensil (100/200) according to any one of preceding claims, wherein at least one of the at least one air inlet (152/252) and the at least one air suction opening (151/251) is arranged on the cover body (120/220).

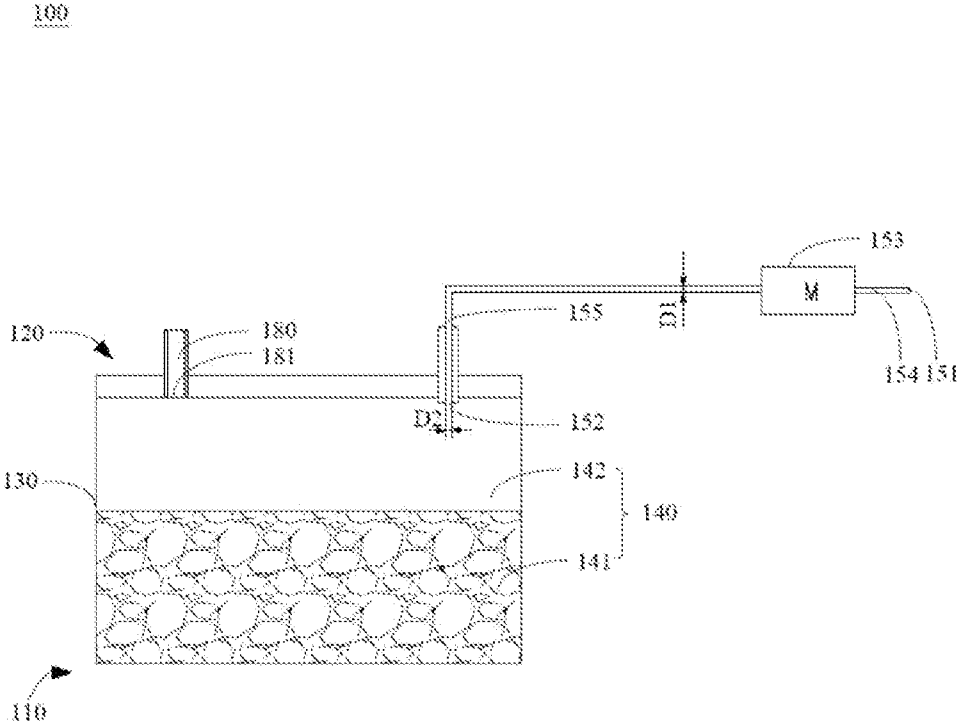

Figure 1

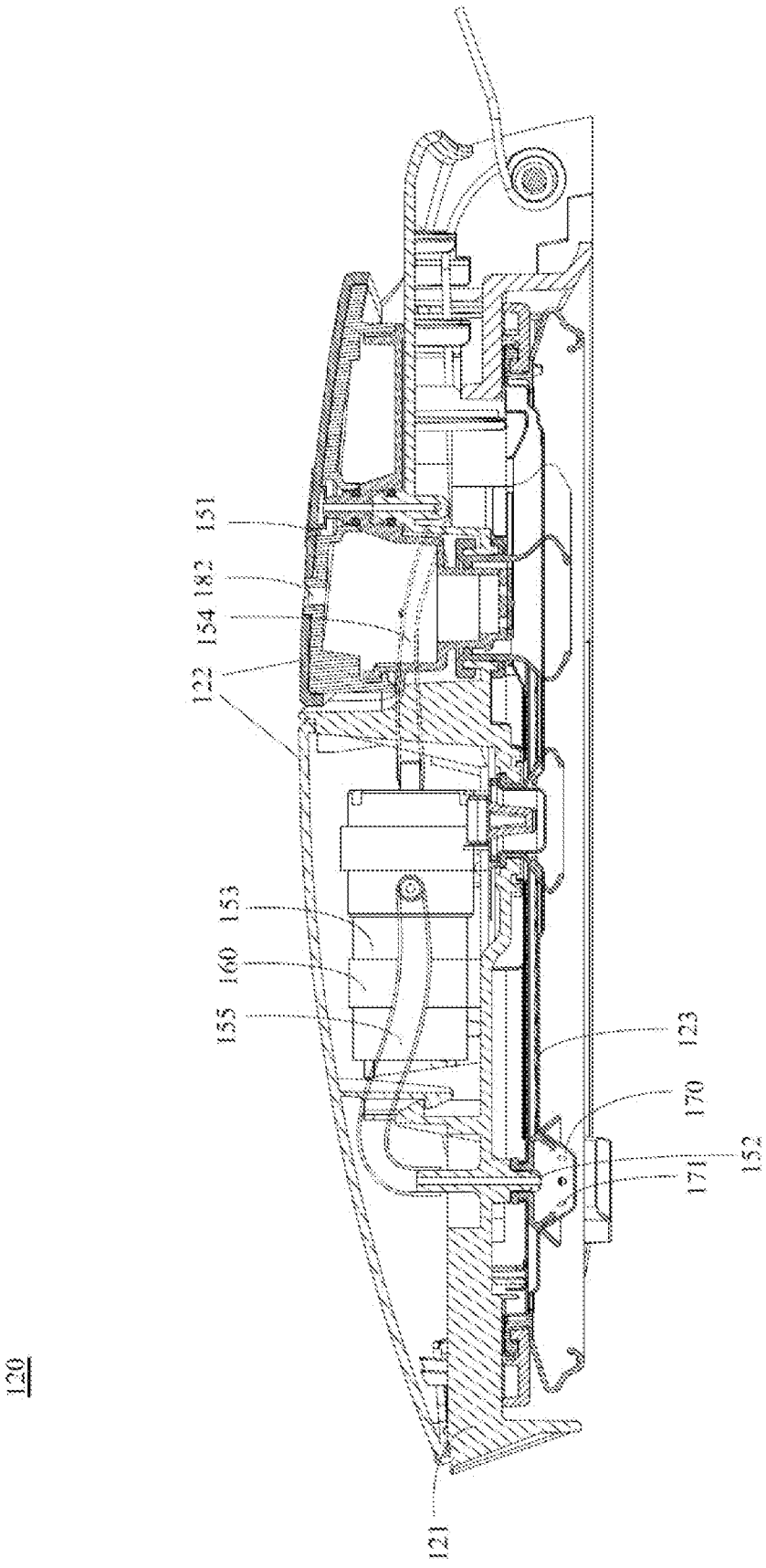

Figure 2

120

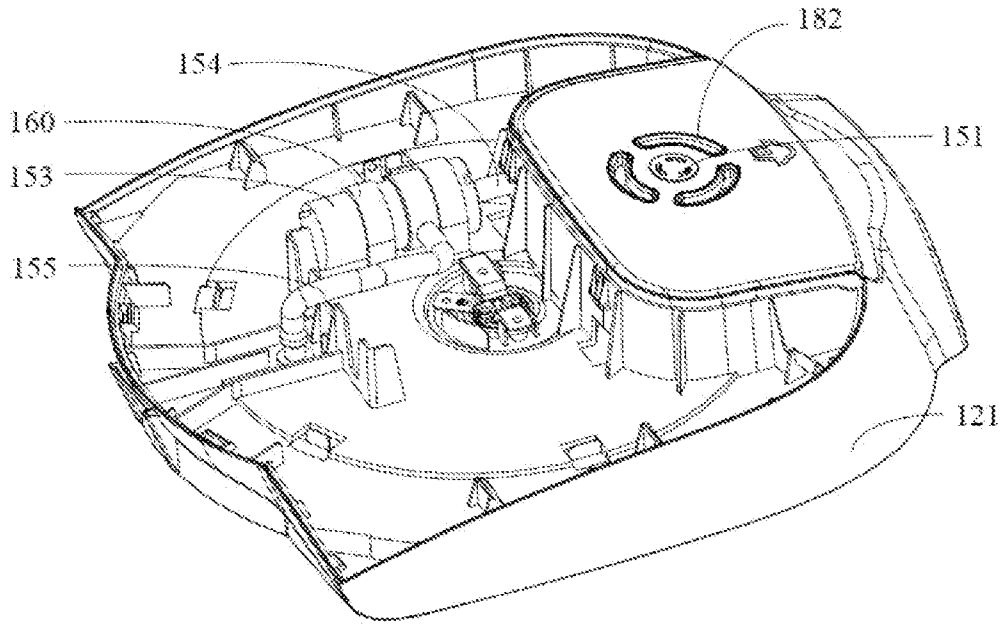

Figure 3

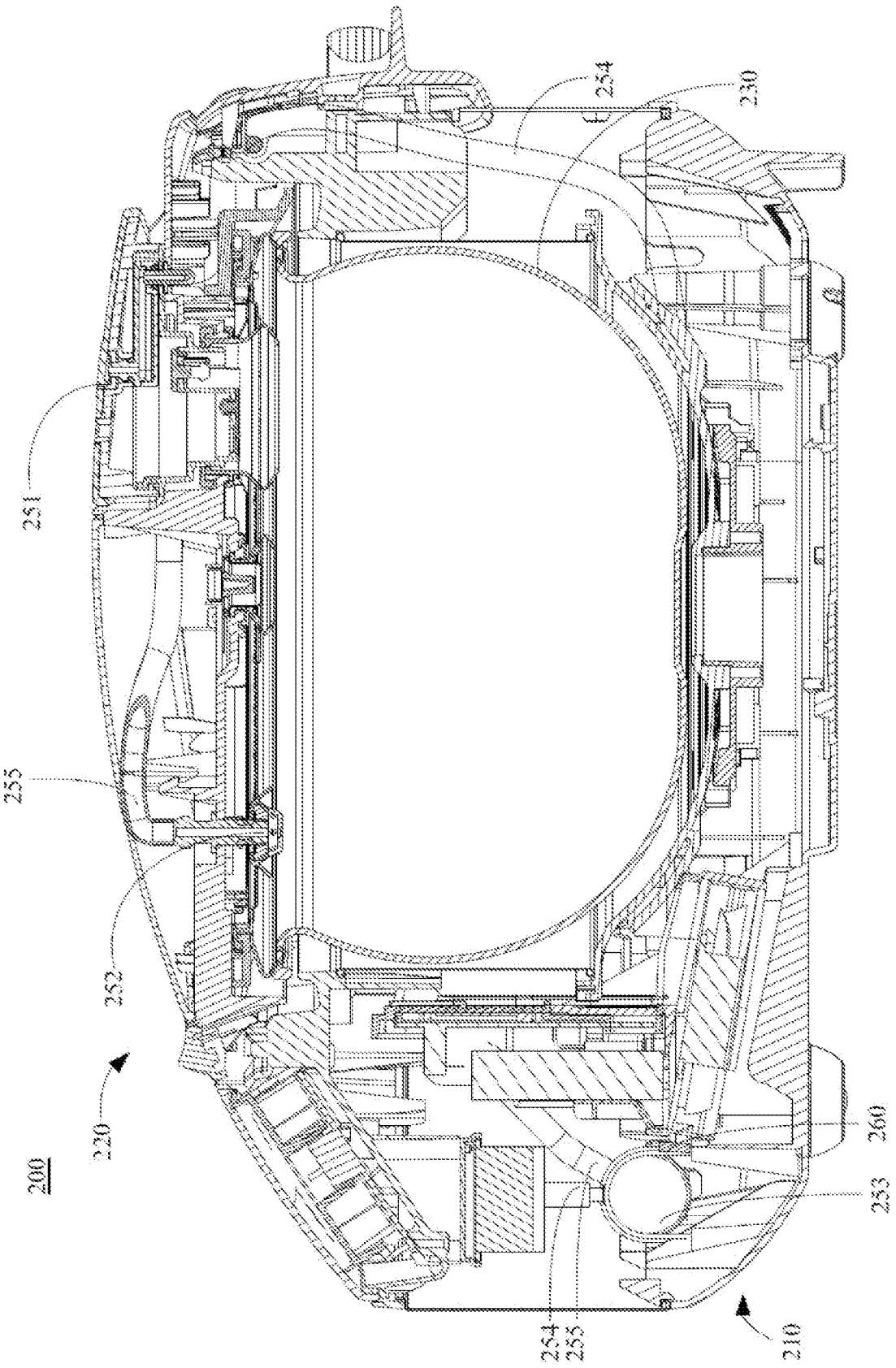

Figure 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2018/118520

A. CLASSIFICATION OF SUBJECT MATTER

A47J 36/00(2006.01)i; A47J 27/00(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)

CNKI,CNPAT,WPI,EPODOC:cook+,food+,device,utensil,pot,air,inlet,suck+,outside,exterior,external,cold,cool+,pump?, bubble?,spill+,boil+,control+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 108175289 A (JIANGSU YANGZHOU TOURISM & BUSINESS VOCATIONAL SCHOOL) 19 June 2018 (2018-06-19) paragraphs [0018]-[0026], figures 1-3	1-5, 7-9, 12-15
Y	CN 108175289 A (JIANGSU YANGZHOU TOURISM & BUSINESS VOCATIONAL SCHOOL) 19 June 2018 (2018-06-19) paragraphs [0018]-[0026], figures 1-3	6, 10-11
Y	CN 207370533 U (ZHEJIANG SHAOXING SUPOR DOMESTIC ELECTRICAL APPLIANCE CO., LTD.) 18 May 2018 (2018-05-18) paragraphs [0035]-[0050], figures 1-13	6, 10-11
X	CN 204133145 U (FOSHAN SHUNDE MIDEA ELECTRICAL HEATING APPLIANCES MANUFACTURING CO., LTD. ET AL.) 04 February 2015 (2015-02-04) paragraphs [0029]-[0059], figures 1-3	1-9, 12-15
A	CN 206700078 U (GUANGDONG MIDEA DOMESTIC ELECTRICAL APPLIANCE MANUFACTURING CO., LTD. ET AL.) 05 December 2017 (2017-12-05) the whole document	1-15
A	CN 203369770 U (MIDEA GROUP CO., LTD. ET AL.) 01 January 2014 (2014-01-01) the whole document	1-15

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

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"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
07 March 2019	**29 March 2019**

Name and mailing address of the ISA/CN	Authorized officer
National Intellectual Property Administration, PRC **6, Xitucheng Rd., Jimen Bridge, Haidian District, Beijing 100088** **China**	**GUO,Xinyue**
Facsimile No. **(86-10)62019451**	Telephone No. **86-(10)-53962471**

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2018/118520

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 107242801 A (GREE ELECTRIC APPLIANCES INC.) 13 October 2017 (2017-10-13) the whole document	1-15
A	US 6595113 B1 (CHANG, WEN-HSIEN ET AL.) 22 July 2003 (2003-07-22) the whole document	1-15

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2018/118520

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 108175289 A	19 June 2018	None	
CN 207370533 U	18 May 2018	None	
CN 204133145 U	04 February 2015	None	
CN 206700078 U	05 December 2017	CN 108261108 A	10 July 2018
CN 203369770 U	01 January 2014	None	
CN 107242801 A	13 October 2017	None	
US 6595113 B1	22 July 2003	None	