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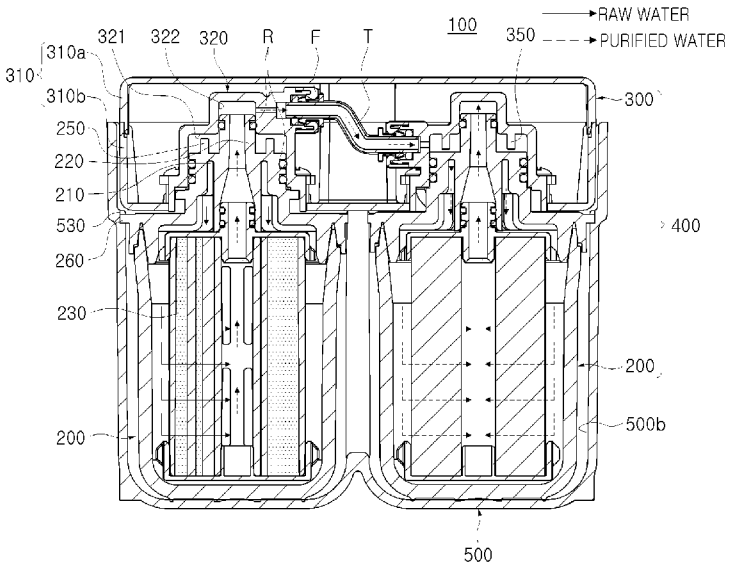
(54) Title: WATER PURIFYING FILTER ASSEMBLY MODULE AND WATER PURIFIER HAVING THE SAME



(57) Abstract: There is provided a water purifying filter assembly module in which when a filtering unit in which one or more water purifying filters are connected to a head unit is installed in and connected to a case unit, raw water is introduced to the filtering unit without a pipe connection operation. The water purifying filter assembly module including: a head unit, to or from which one or more water purifying filters are connected or separated, allowing raw water to flow into the water purifying filters and purified water filtered by the water purifying filters to flow out therefrom, when the water purifying filters are connected to the head unit; and a case unit, to or from which a filtering unit in which the water purifying filters are connected to the head unit is connected or separated so as to be installed therein, allowing raw water to flow into the head unit and purified water from the head unit to flow out therefrom, when the filtering unit is connected to the case unit.

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Description

Title of Invention: WATER PURIFYING FILTER ASSEMBLY MODULE AND WATER PURIFIER HAVING THE SAME

Technical Field

[1] The present invention relates to a water purifying filter assembly module in which one or more water purifying filters are connected or separated, and in the case that the water purifying filters are connected, raw water is introduced to the water purifying filters and purified water filtered by the water purifying filters flows out therefrom, and a water purifier having the same, and more particularly, to a water purifying filter assembly module in which when a filtering unit in which one or more water purifying filters are connected to a head unit is installed in and connected to a case unit, raw water is introduced to the filtering unit without a pipe connection operation, and purified water filtered by the filtering unit flows out therefrom, and a water purifier having the same.

Background Art

[2] A water purifying filter assembly module is a device installed in a water purifier, or the like, in which one or more water purifying filters are connected, raw water is introduced to the water purifying filters, and purified water filtered by the water purifying filters flows to the outside, e.g., to a purified water tank storing purified water.

[3] A related art water purifying filter assembly module is provided in a water purifier, or the like, and includes a head unit having one or more water purifying filters connected thereto or separated therefrom, supplies raw water to the connected water purifying filters, and allows purified water filtered by the water purifying filters to flow out therefrom to the outside.

[4] In the related art water purifying filter assembly module, since the head unit, to and from which the water purifying filters are connected or separated, is disposed in the water purifier, or the like, a certain amount of space is required for the water purifying filters to be connected or separated.

[5] Thus, when the water purifier, or the like, is positioned in a narrow space, it is not easy for the water purifying filters to be connected to or separated from the head unit, making it difficult to replace the water purifying filters.

[6] Further, when the water purifying filters are replaced, water may be leaked from the head unit or the water purifying filter, and in this case, since water is leaked to the water purifier equipped with the head unit, or the like, electronic equipment may suffer a failure, or the water purifier may be contaminated.

[7] Also, in the case of connecting two or more water purifying filters to the related art water purifying filter assembly module, the two or more water purifying filters cannot be connected in series. Namely, in the case of connecting two or more water purifying filters to the related art water purifying filter assembly module, two or more water purifying filters are connected to the water purifying filter assembly module in parallel.

[8] Thus, water may be simultaneously introduced to the two or more water purifying filters, and water filtered by the two or more water purifying filters simultaneously flows out therefrom. Thus, two or more different types of water purifying filter cannot be connected to the water purifying filter assembly module, and since only the same type of water purifying filter can be used, water filtering efficiency based on water purifying filters may be degraded.

[9] In addition, since only the same type of two or more water purifying filters are connected to the water purifying filter assembly module, the two or more water purifying filters should be replaced together. Namely, if only some of the same type of water filters, among two or more water purifying filters, are replaced, water filtration efficiency is degraded by the unreplaced water purifying filter.

Disclosure of Invention

Technical Problem

[10] The present invention has been devised through recognition of any one of the issues or problems evident in the related art.

[11] An aspect of the present invention provides a water purifying filter assembly module in which when a filtering unit in which one or more water purifying filters are connected to a head unit is installed in and connected to a case unit, raw water is introduced to the filtering unit without a pipe connection operation, and purified water filtered by the filtering unit flows out therefrom, and a water purifier having the same.

[12] An aspect of the present invention also provides a water purifying filter assembly module in which a filtering unit in which water purifying filters are connected to a head unit is connected to a case unit or separated therefrom such that it is easily installed therein.

[13] An aspect of the present invention also provides a water purifying filter assembly module in which a water purifying filter may be replaced, even in a narrow space.

[14] An aspect of the present invention also provides a water purifying filter assembly module in which when a filtering unit in which water purifying filters are connected to a head unit is separated from a case unit, raw water is prevented from flowing into the water purifying filters.

[15] An aspect of the present invention also provides a water purifying filter assembly module in which when a filter unit including water purifying filters connected to a

head unit is separated, water is allowed to be leaked to a case unit to thus prevent contamination or an incident due to leaking water.

Solution to Problem

[16] A water purifying filter assembly module and a water purifier having the same in relation to an embodiment for realizing at least one of the tasks may have the following features.

[17] The present invention is largely based on a technique in which when a filtering unit in which one or more water purifying filters are connected to a head unit is connected to a case unit so as to be installed therein, raw water is introduced to the filtering unit without a pipe connection operation, and purified water filtered by the filtering unit flows out therefrom.

[18] According to an aspect of the present invention, there is provided a water purifying filter assembly module including: a head unit, to or from which one or more water purifying filters are connected or separated, allowing raw water to flow into the water purifying filters and purified water filtered by the water purifying filters to flow out therefrom, when the water purifying filters are connected to the head unit; and a case unit, to or from which a filtering unit in which the water purifying filters are connected to the head unit is connected or separated so as to be installed therein, allowing raw water to flow into the head unit and purified water from the head unit to flow out therefrom, when the filtering unit is connected to the case unit.

[19] In this case, when the filtering unit is separated from the case unit, the filtering unit may be lifted upwardly from the case unit.

[20] Also, the head unit may include: a head unit main body; a filter connection part disposed in the head unit main body to allow raw water to flow into the water purifying filters and purified water filtered by the water purifying filters to flow out therefrom, when the water purifying filters are connected; and a detaching part disposed in the head unit main body to facilitate a connection to or separation from the case unit.

[21] One detaching part may be disposed on either side of the head unit main body.

[22] Also, the detaching part may include a detaching member elastically supported by the head unit main body in order to connect the filtering unit to the case unit or separate the filtering unit therefrom.

[23] The detaching part may include: an elastic member inserted into an insertion projection formed on a head unit main body; and a detaching member elastically supported by the elastic member and configured to be caught by the case unit when connected to the case unit and released from the case unit when separated from the case unit.

[24] Also, a handle portion may be formed on one side of the detaching member such that

the handle portion is inserted into and protruded from a handle hole formed in the head unit main body, and a stopping projection may be formed on the other side of the detaching member such that the stopping projection is inserted into and protruded from an insertion hole formed in the head unit main body and caught by a stopping hole formed in the case unit when connected to the case unit.

[25] The head unit may further include: an inlet/outlet part disposed in the head unit main body and allowing raw water introduced to the case unit to flow into the filter connection part and purified water flowing out from the filter connection unit to flow out therefrom through the case unit, when connected to the case unit.

[26] Also, the inlet/outlet part may include: a raw water inlet having one side disposed in the head unit main body so as to be connected to an inlet connection portion included in the filter connection part and the other side inserted into an inlet insertion part disposed in the case unit, when connected to the case unit; and a purified water outlet having one side disposed in the head unit main body so as to be connected to an outlet connection portion included in the filter connection part and the other side inserted into an outlet insertion part provided in the case unit, when connected to the case unit.

[27] A sealing member may be disposed on the raw water inlet and the purified water outlet.

[28] Also, the filter connection part may include: an inlet connection portion connected to an inlet disposed in the water purifying filter when the water purifying filter is connected; and an outlet connection portion connected to an outlet disposed in the water purifying filter when the water purifying filter is connected.

[29] The case unit may include the inlet insertion part connected to a raw water source, the raw water inlet portion included in the head unit being inserted thereinto when the filtering unit is connected; and the outlet insertion part, into which the purified water outlet included in the head unit is inserted, when the filtering unit is connected.

[30] Also, the inlet insertion part may include an opening and closing member opening a flow channel formed in the inlet insertion part when the raw water inlet is inserted therein and closing the flow channel when the raw water inlet is separated.

[31] The opening and closing member may be elastically supported by an elastic member provided in the inlet insertion part.

[32] Also, the stopping hole may be formed in an upper portion of the case unit to allow a stopping projection formed in the detaching member included in the head unit to be caught therein when the filtering unit is connected.

[33] The case unit may have a shape corresponding to the filtering unit to allow the filtering unit to be installed therein.

[34] Also, the case unit may include a filter insertion part into which the water purifying filter is inserted when the filtering unit is connected thereto.

[35] According to another aspect of the present invention, there is provided a water purifier including: a water purifier housing: and the foregoing water purifying filter assembly module installed in the water purifier housing, wherein the head unit included in the water purifying filter assembly module may be exposed from an upper surface of the water purifier housing or may be exposed to the outside when a top cover of the water purifier housing is separated.

Advantageous Effects of Invention

[36] According to an embodiment of the present invention, when the filtering unit in which one or more water purifying filters are connected to the head unit is connected to the case unit such that it is installed in the case unit, raw water can flow into the filtering unit without a pipe connection operation and purified water filtered by the water purifying filters can flow out therefrom.

[37] Also, according to an embodiment of the present invention, the filtering unit in which water purifying filters are connected to a head unit can be connected to a case unit such that it is easily installed therein or separated therefrom.

[38] Also, according to an embodiment of the present invention, since the filtering unit is completely lifted upwardly by separating it from the case unit and the water purifying filter is separated from the head unit, the water purifying filter can be replaced even in a narrow space.

[39] Also, according to an embodiment of the present invention, when the filtering unit in which the water purifying filters are connected to the head unit is separated from the case unit, the elastically supported opening and closing member closes the opening and closing member to prevent raw water from flowing into the water purifying filters.

[40] Also, according to an embodiment of the present invention, when the filtering unit in which the water purifying filters are connected to the head unit is separated from the case unit, although water is leaked, it is leaked to the case unit, thus preventing contamination of the interior of the water purifier or an electric incident, or the like, due to the dripping water.

[41] Also, according to an embodiment of the present invention, two or more different types of water purifying filters may be connected in series.

[42] Also, according to an embodiment of the present invention, two or more water purifying filters may not be replaced together.

[43] Also, according to an embodiment of the present invention, water filtering efficiency by the water purifying filters can be enhanced.

[44] Also, according to an embodiment of the present invention, two or more water purifying filters can be connected to appropriate filter connection parts, respectively, among two or more filter connection parts included in the head unit to allow the water

purifying filters to be connected thereto.

Brief Description of Drawings

[45] FIG. 1 is a perspective view of a water purifying filter assembly module according to an embodiment of the present invention.

[46] FIG. 2 is a view illustrating water purifying filters of the water purifying filter assembly module according to an embodiment of the present invention.

[47] FIG. 3 is an exploded perspective view of a head unit of the water purifying filter assembly module according to an embodiment of the present invention.

[48] FIG. 4 is a perspective view of a case unit of the water purifying filter assembly module according to an embodiment of the present invention.

[49] FIG. 5 is a cross-sectional view taken along line A-A in FIG. 1.

[50] FIG. 6 is a cross-sectional view taken along line B-B in FIG. 1.

[51] FIG. 7 is a cross-sectional view illustrating a state in which a filtering unit is separated from the case unit in the water purifying filter assembly module according to an embodiment of the present invention.

[52] FIG. 8 is a cross-sectional view illustrating a state in which water purifying filters are separated from the head unit in the water purifying filter assembly module according to an embodiment of the present invention.

[53] FIG. 9 is a perspective view of a water purifier according to an embodiment of the present invention.

Mode for the Invention

[54] To help understand the foregoing features of the present invention, a water purifying filter assembly module and a water purifier having the same in relation to an embodiment of the present invention will be described in detail with reference to the accompanying drawings.

[55] Hereinafter, embodiments most appropriate to help in an understanding of the technical features of the present invention will be described, the technical features of the present invention are not limited by the described embodiments and merely illustrate the implementation of the present invention through the embodiments described hereinafter. Thus, the present invention can be variably modified within the scope of the present invention through the embodiments described below, and such modifications are within the scope of the present invention. In order to help understand the embodiments described hereinafter, the like or similar reference numerals are used for relevant components among the components having the same function in the respective embodiments in the accompanying drawings.

[56] Embodiments in relation to the present invention are based on a concept that when a filtering unit in which one or more water purifying filters are connected to a head unit

is installed in and connected to a case unit, raw water is introduced to the filtering unit without a pipe connection operation, and purified water filtered by the filtering unit flows out therefrom.

[57] As shown in an embodiment illustrated in FIGS. 1 and 5, a water purifying filter assembly module 100 according to an embodiment of the present invention may include a head unit 300 to or from which one or more water purifying filters 200 are connected or separated and a case unit 500 to or from which a filtering unit 400 including the water purifying filters 200 connected to the head unit 300 is connected so as to be installed therein or separated.

[58] As shown in the embodiment illustrated in FIGS. 2 and 5, the water purifying filter 200 may have an inlet 210 through which raw water or purified water filtered by a different water purifying filter 200 flows. Also, as shown in the illustrated embodiment, the water purifying filter 200 may have a filtering member 230 filtering raw water introduced through the foregoing inlet 210 or purified water introduced after being filtered by the different water purifying filter 200. Also, the water purifying filter 200 may have an outlet 220 allowing filtered purified water to flow out therethrough.

[59] Also, as shown in the embodiment illustrated in FIG. 2, the water purifying filter 200 may have a connection protuberance 240 formed thereon. The connection protuberance 240 of the water purifying filter 200 may be caught by a stopping projection (not shown) formed on a filter connection part 320 (to be described) included in the head unit 300 or released therefrom according to rotation of the water purifying filter 200.

[60] Through such a configuration, the water purifying filter 200 may be connected to the head unit 300, specifically, to the filter connection part 320 of the head unit 300 in the illustrated embodiment, through rotation, as illustrated in FIGS. 5 and 7, or may be separated therefrom as illustrated in FIG. 8.

[61] In this case, as shown in the embodiment illustrated in FIG. 2, the water purifying filter 200 may have a rotation preventing projection 260. Also, as shown in the embodiment illustrated in FIG. 4, a rotation preventing recess 530 may be formed in a filter insertion part 500b formed to allow the water purifying filter 200 to be inserted into the case unit 500 (to be described).

[62] Through such a configuration, as illustrated in FIG. 5, when the filtering unit 400 connected to the head unit 300 is inserted into the filter insertion part 500b so as to be installed in the case unit 500, the rotation preventing projection 260 of the water purifying filter 200 may be inserted into the rotation preventing recess 530 of the filter insertion part 500b of the case unit 500. Accordingly, the water purifying filter 200 inserted in the filter insertion part 500b may not be rotated. Thus, the water purifying filter 200 inserted in the filter insertion part is prevented, for example, from being rotated by pressure of water introduced into the water purifying filter 200 and

separated from the filter connection part 320.

[63] Also, as shown in the embodiment illustrated in FIG. 2, the water purifying filter 200 may have an identification projection 250. Also, as shown in the illustrated embodiment, the identification projection 250 may not be formed on the different water purifying filter 200.

[64] In addition, as shown in the embodiment illustrated in FIG. 5, a different identification projection 350 may be formed on the filter connection part (to be described) included in the head unit 300, to which the water purifying filter 200 with the identification projection 250 formed thereon is not to be connected. Also, the different identification projection 350 may not be formed on a filter connection part 320 to which the water purifying filter 200 is to be connected.

[65] Thus, the identification projection 250 formed on the water purifying filter 200 may be interfered with by the identification projection 350 formed on the filter connection part 320, and thus, the water purifying filter 200 may not be connected to the filter connection part 320 to which the water purifying filter 200 should not be connected, and may only be connected to the filter connection part 320 to which the water purifying filter 200 should be connected. Namely, two or more water purifying filters 200 may be connected to appropriate filter connection parts 320, respectively, among the two or more filter connection parts 320 included in the head unit 300 to allow the water purifying filters 200 to be connected thereto.

[66] As shown in the embodiment illustrated in FIGS. 5, 7, and 8, one or more water purifying filters 200 may be connected to the head unit 300 or separated therefrom. As shown in the illustrated the embodiment, two water purifying filters 200 may be connected to or separated from the head unit 300. However, the number of water purifying filters 200 connected to or separated from the head unit 300 is not limited thereto and any number of water purifying filters 200 may be connected to or separated from the head unit 300 as long as it is one or more.

[67] Also, the head unit 300 may be configured to allow raw water to be introduced to the water purifying filter 200 and purified water filtered by the water purifying filter 200 to flow out therefrom, when the water purifying filter 200 is connected to the head unit 300.

[68] To this end, as shown in the embodiment illustrated in FIG. 3, the head unit 300 may include a head unit main body 310, the filter connection part 320, and a detaching part 330.

[69] As shown in the embodiment illustrated in FIGS. 3 and 5, the head unit main body 310 may include a cover member 310a and a main body member 310b. The head unit main body 310 may be configured by connecting the cover member 310a to an opened upper portion of the main body member 310b. To this end, as shown in the em-

bodiment illustrated in FIG. 3, the cover member 310a includes an insertion projection 311, and the main body member 310b may include an insertion recess 312. When the cover member 310a is connected to the opened upper portion of the main body member 310b, the foregoing insertion projection 311 may be inserted into the insertion recess 312.

[70] However, the configuration in which the cover member 310a is connected to the opened upper portion of the main body member 310b to form the head unit main body 310 is not limited thereto, and any known configuration may be employed as long as the cover member 310a is connected to the opened upper portion of the main body member 310b to form the head unit main body 310.

[71] As illustrated in FIGS. 3 and 5, the filter connection part 320 may be disposed in the head unit main body 310, i.e., specifically, in the main body member 310b of the head unit main body 310 in the illustrated embodiment, to allow raw water to be introduced to the water purifying filter 200 and purified water filtered by the water purifying filter 200 to flow out therefrom, when the water purifying filter 200 is connected thereto.

[72] As illustrated, two filter connection parts 320 may be included in the head unit 300. Accordingly, two water purifying filters 200 may be connected to or separated from the head unit 300. However, the number of the filter connection parts 320 included in the head unit 300 is not limited thereto and one filter connection part or three or more filter connection parts may be included in the head unit 300. When one filter connection part 320 is included in the head unit 300, only one water purifying filter 200 may be connected to or separated from the head unit 300. When three or more filter connection parts 320 are included in the head unit 300, three or more water purifying filters 200 may be connected to or separated from the head unit 300.

[73] As shown in the embodiment illustrated in FIGS. 3 and 5, the filter connection part 320 may include an inlet connection portion 321 and an outlet connection portion 322.

[74] As shown in the embodiment illustrated in FIG. 5, the inlet connection portion 321 may be connected to the inlet 210 provided in the water purifying filter 200 when the water purifying filter 200 is connected. Thus, as illustrated in FIG. 5, raw water introduced to the inlet connection portion 321 may flow to the inlet 210 of the water purifying filter 200.

[75] Also, as shown in the embodiment illustrated in FIG. 5, when the water purifying filter 200 is connected, the outlet connection portion 322 may be connected to the outlet 220 provided in the water purifying filter 200. Thus, as illustrated in FIG. 5, raw water introduced to the water purifying filter 200 through the inlet connection portion 321 and the inlet 210 of the water purifying filter 200 is filtered by the filtering member 230 provided in the water purifying filter 200, while passing therethrough, and subsequently flows out therefrom through the outlet 220 of the water purifying filter

200 and the outlet connection portion 322.

[76] As shown in the embodiment illustrated in FIGS. 3 and 5, two filter connection parts 320 may be provided in the head unit main body 310, specifically, in the main body members 310b of the head unit main body 310. As shown in the illustrated embodiment, the two filter connection parts 320 may be connected by a connection pipe T. Namely, as shown in the illustrated embodiment, one side and the other side of the connection pipe T may be connected to the two filter connection parts 320 by a fitting member F, respectively.

[77] Also, as shown in the embodiment illustrated in FIGS. 3 and 5, one side of the connection pipe T may be connected to the outlet connection portion 322 of the filter connection part 320, and the other side of the connection pipe T may be connected to the inlet connection portion 321 of the other filter connection part 320. Accordingly, as illustrated in FIG. 5, purified water filtered by one water purifying filter 200 may flow out therefrom from the outlet connection portion 322 of the one filter connection part 320 connected thereto, flows through the connection pipe T, and subsequently flows into the inlet connection portion 321 of the other filter connection part 320, thus being introduced to the other water purifying filter 200.

[78] Through such a configuration, two or more types of water purifying filters 200 may be connected in series by connecting them to the head unit 300. Thus, in comparison to a case in which the same type of water purifying filters 200 are connected in parallel, water filtering efficiency by the water purifying filters 200 can be enhanced.

[79] Because different types of water purifying filters 200 have different life spans, the water purifying filters 200 connected to the head unit 300 may not necessarily be replaced together.

[80] Meanwhile, as shown in the embodiment illustrated in FIGS. 2 and 5, one or more sealing members R may be disposed in the inlet 210 and the outlet 220 of the water purifying filter 200. Accordingly, as described above and as illustrated in FIG. 5, since the inlet 210 and the outlet 220 are connected to the inlet connection portion 321 and the outlet connection portion 322 of the filter connection part 320, respectively, when raw water or purified water flows, it is not leaked to the outside.

[81] The detaching part 330 may be disposed in the head unit main body 310, i.e., in the main body member 310b of the head unit main body 310 in the embodiment illustrated in FIG. 3. By virtue of the detaching part 330, the filtering unit 400 in which the water purifying filter 200 is connected to the head unit 300 may be easily connected to the case unit 500 as illustrated in FIG. 5 or may be easily separated from the case unit 500 as illustrated in FIG. 7.

[82] As shown in the embodiment illustrated in FIG. 3, two detaching parts 330 may be provided in both sides of the head unit main body 310, i.e., in both sides of the main

body member 310b of the head unit main body 310 in the illustrated embodiment. However, the number of the detaching parts 330 is not limited thereto and any number of detaching parts may be provided as long as the filtering unit 400 in which the water purifying filter 200 is connected to the head unit 300 is easily connected to the case unit 500 or easily separated from the case unit 500.

[83] The detaching part 330 may include a detaching member 332 elastically supported in the head unit main body 310 in order to connect the filtering unit 400 to the case unit 500 or separate the filtering unit 400 from the case unit 500.

[84] To this end, as shown in the embodiment illustrated in FIG. 3, the detaching part 330 may include an elastic member 331 and the foregoing detaching member 332.

[85] As shown in the embodiment illustrated in FIG. 3, the elastic member 331 may be inserted into the head unit main body 310, specifically, into an insertion projection 310c provided in the main body member 310b of the head unit main body 310.

[86] As shown in the embodiment illustrated in FIG. 3, the detaching member 332 may be elastically supported by the foregoing elastic member 331. Also, the detaching member 332 may configured to allow the filtering unit 400 in which the water purifying filter 200 is connected to the head unit 300 to be caught in the case unit 500 when the filtering unit 400 is connected to the case unit 500 as illustrated in FIG. 5, and allow the filtering unit 400 to be released from the case unit 500 when the filtering unit 400 is separated from the case unit 500 as illustrated in FIG. 7. Accordingly, as mentioned above, the filtering unit 400 may be easily connected to the case unit 500 or easily separated from the case unit 500.

[87] To this end, as illustrated in FIGS. 3 and 6 through 8, a handle portion 332a may be formed on one side of the detaching member 332, and a stopping projection 332b may be formed on the other side of the detaching member 332.

[88] As shown in the embodiment illustrated in FIGS. 3 and 6 through 8, the handle portion 332a may be inserted into the head unit main body 310, specifically into a handle hole 310d formed in the main body member 310b of the head unit main body 310, so as to be protruded. Thus, the user may easily press the handle portion 332a. Also, to this end, the handle portion 332a may have a plurality of abrasive projections or a plurality of abrasive recesses formed thereon as illustrated.

[89] As shown in the embodiment illustrated in FIGS. 3 and 6 through 8, the stopping projection 332b may be inserted into an insertion hole 310e formed on the head unit main body 310, specifically on the main body member 310b of the head unit main body 310 in the illustrated embodiment, so as to be protruded. Also, the stopping projection 332b may be caught in a stopping hole 500a formed in the case unit 500 when the filtering unit 400 in which the water purifying filter 200 is connected to the head unit 300 is connected to the case unit 500, as illustrated in FIG. 6.

[90] Namely, when the user applies external force by pressing the handle portion 332a of the detaching member 332, the detaching member 332, overcoming elastic force of the elastic member 331, may move inwardly of the head unit main body 310, specifically, the main body member 310b of the head unit main body 310.

[91] In this state, as illustrated in FIG. 5, the filtering unit 400 in which the water purifying filter 200 is connected to the head unit 300 is insertedly installed in the case unit 500. When external force applied to the handle portion 332a of the detaching member 332 is removed, the detaching member 332 is moved to an outer side of the head unit main body 310, specifically, the main body member 310b of the head unit main body 310 in the illustrated embodiment, so as to be returned to its original position.

[92] Accordingly, as illustrated in FIGS. 5 and 6, when the filtering unit 400 in which the water purifying filter 200 is connected to the head unit 300 is insertedly installed in the case unit 500, the stopping projection 332b of the detaching member 332 may be caught in the stopping hole 500a formed in the case unit 500 as illustrated in FIG. 6. Thus, the filtering unit 400 in which the water purifying filter 200 is connected to the head unit 300 is insertedly installed in the case unit 500 such that it is not separated from the case unit 500 as illustrated.

[93] Also, in the state illustrated in FIG. 6, when the user applies external force to the handle portion 332a of the detaching member 332 by pressing the handle portion 332a, as mentioned above, the detaching member 332, overcoming elastic force of the elastic member 331, is moved inwardly of the head unit main body 310, specifically, inwardly of the main body member 310b of the head unit main body 310 in the illustrated embodiment. Accordingly, the stopping projection 332b of the detaching member 332 is released from the stopping hole 500a of the case unit 500. Accordingly, as illustrated in FIG. 7, the filtering unit 400 insertedly positioned in the case unit 500 can be easily separated from the case unit 500.

[94] Also, as described above, after the filtering unit 400 is separated from the case unit 500 and external force applied to the handle portion 332a of the detaching member 332 is removed, the detaching member 332 is returned to its original position by elastic force of the elastic member 331.

[95] Accordingly, the filtering unit 400 in which the water purifying filter 200 is connected to the head unit 300 may be connected to and separated from the case unit 500 such that it is easily installed therein.

[96] Meanwhile, as mentioned above, after the filtering unit 400 in which the water purifying filter 200 is connected to the head unit 300 is separated from the case unit 500, the water purifying filter 200 may be rotated to be separated from the head unit 300 as illustrated in FIG. 8.

[97] Also, after a new water purifying filter 200 is connected to the head unit 300 through rotation, the filtering unit 400 in which the water purifying filter 200 is connected to the head unit 300 may be connected to the case unit 500 such that it is installed in the case unit 500.

[98] Thus, rather than providing the head unit 300 to which the water purifying filter 200 is directly connected as in the related art to a water purifier, or the like, the case unit 500 to which the filtering unit 400 in which the water purifying filter 200 is connected to the head unit 300 is connected may be provided to a water purifier, or the like.

[99] Also, after the filtering unit 400 in which the water purifying filter 200 is connected to the head unit 300 is separated from the case unit 500, the water purifying filter 200 may be replaced, and the filtering unit 400 in which the water purifying filter 200 is connected to the head unit 300 may be connected to the case unit 500.

[100] Also, when the filtering unit 400 is separated from the case unit 500, it may be lifted upwardly of the case unit 500. Thus, because the water purifying filter 200 is not connected to the head unit 300 or separated from the head unit 300 with the head unit 300 connected to a water purifier (not shown) as in the related art, the water purifying filter 200 may be replaced even in a narrow space.

[101] Also, the head unit 300 may further include an inlet/outlet part 340. As shown in the embodiment illustrated in FIG. 3, the inlet/outlet part 340 may be provided in the head unit main body 310, specifically, in the main body member 310b of the head unit main body 310 in the illustrated embodiment. As illustrated in FIG. 6, the inlet/outlet part 340 may be configured to allow raw water introduced to the case unit 500 to flow into the filter connection part 320 and purified water flowing out of the filter connection part 320 to flow out therefrom through the case unit 500, when the filtering unit 400 in which the water purifying filter 200 is connected to the head unit 300 is connected to the case unit 500. To this end, as shown in the embodiment illustrated in FIGS. 3 and 6, the inlet/outlet part 340 may include a raw water inlet 341 and a purified water outlet 342.

[102] As shown in the embodiment illustrated in FIG. 3, one side of the raw water inlet 341 may be disposed on the head unit main body 310, specifically, on the main body member 310b in the illustrated embodiment, so as to be connected to the inlet connection portion 321 of the foregoing filter connection part 320 as illustrated in FIG. 6. One side of the raw water inlet 341 may be connected to the other side of the connection pipe T having one side connected to the inlet connection portion 321 of the filter connection part 320 so as to be connected to the inlet connection portion 321 of the filter connection part 320 as in the illustrated embodiment. One side and the other side of the connection pipe T may be connected to one side of the inlet connection portion 321 of the filter connection part 320 and one side of the raw water inlet 341 by

the fitting member F.

[103] Also, as illustrated in FIG. 6, when the filtering unit 400 in which the water purifying filter 200 is connected to the head unit 300 is connected to the case unit 500, the other side of the raw inlet 341 may be inserted to be connected to an inlet insertion part 510 (to be described) provided in the case unit 500 and connected to a raw water source (not shown) such as tap water, or the like.

[104] Accordingly, when raw water from the raw water source is introduced to the inlet insertion part 510, the raw water introduced to the inlet insertion portion 510 may be introduced to the raw water inlet 341. The raw water introduced to the raw water inlet 341 may flow to the inlet connection portion 321 of the foregoing filter connection part 320. Also, the raw water flowing to the inlet connection portion 321 of the filter connection part 320 may be introduced to the water purifying filter 200 through the inlet 210 of the water purifying filter 200 connected to the inlet connection portion 321 of the filter connection part 320.

[105] As shown in the embodiment illustrated in FIGS. 3 and 6, one side of the purified water outlet 342 may be provided in the head unit main body 310, specifically, in the main body member 310b of the head unit main body 310, so as to be connected to the outlet connection portion 322 of the foregoing filter connection part 320. As shown in the illustrated embodiment, one side of the purified water outlet 342 may be connected to the other side of the connection pipe T having one side connected to the outlet connection portion 322 of the filter connection part 320, so as to be connected to the outlet connection portion 322 of the filter connection part 320. As shown in the illustrated embodiment, one side and the other side of the connection pipe T may be connected to one side of the outlet connection portion 322 of the filter connection part 320 and one side of the purified water outlet 342 by the fitting member F.

[106] Also, as illustrated in FIG. 6, when the filtering unit 400 in which the water purifying filter 200 is connected to the head unit 300 is connected to the case unit 500, the other side of the purified water outlet 342 may be inserted in and connected to the outlet insertion part 520 provided in the case unit 500. Accordingly, purified water flowing out of the outlet 220 of the water purifying filter 200 after being filtered by the water purifying filter 200 may be introduced to the purified water outlet 342 through the outlet connection portion 322 of the filter connection part 320. The water introduced to the purified water outlet 342 may be introduced to the outlet insertion part 520 so as to flow out therefrom to the outside.

[107] Meanwhile, as shown in the embodiment illustrated in FIGS. 3 and 6, one or more sealing members R may be provided on the other side of the raw water inlet 341 and the purified water outlet 342. Accordingly, as mentioned above, when the filtering unit 400 in which the water purifying filter 200 is connected to the head unit 300 is

connected to the case unit 500 and raw water is introduced to the raw water inlet 341 through the inlet insertion part 510 of the case unit 500, the raw water may not be leaked to the outside. Also, as mentioned above, when purified water flowing out of the purified water outlet 342 flows to the outlet insertion part 520 of the case unit 500, it may not be leaked to the outside.

[108] The filtering unit 400 in which the water purifying filter 200 is connected to the head unit 300 may be connected to the case unit 500 such that it is installed therein or separated therefrom. Also, the case unit 500 may be configured to allow raw water to be introduced to the head unit 300 and purified water flowing out of the head unit 300 to flow out therefrom, when the filtering unit 400 is connected. To this end, as shown in the embodiment illustrated in FIGS. 4 and 6, the case unit 500 may include the inlet insertion part 510 and the outlet insertion part 520.

[109] The inlet insertion part 510 may be connected to, for example, a raw water source (not shown) such as tap water, or the like. Also, as illustrated in FIG. 6, when the filtering unit 400 is connected to the case unit 500, the foregoing raw water inlet 341 included in the head unit 300 may be inserted to be connected. Accordingly, as described above and as illustrated in FIG. 6, raw water from the raw water source is introduced to the head unit 300, i.e., the inlet connection portion 321 of the filter connection part 320 of the head unit, through the inlet insertion part 510 and the raw water inlet 341, so as to be introduced to the inlet 210 of the water purifying filter 200.

[110] Meanwhile, as shown in the embodiment illustrated in FIG. 6, the inlet insertion part 510 may include an opening and closing member 511. When the raw water inlet 341 is inserted, a flow channel formed in the inlet insertion part 510 may be opened by the opening and closing member 511, and when the raw water inlet 341 is separated, the flow channel may be closed by the opening and closing member 511. Also, the opening and closing member 511 may be elastically supported by the elastic member 512 provided in the inlet insertion part 510.

[Ill] Through such a configuration, as illustrated in FIG. 6, when the filtering unit 400 is connected to the case unit 500 so the raw water inlet 341 is insertedly connected to the inlet insertion portion 510, the opening and closing member 511 may overcome elastic force of the elastic member 512 by the raw water inlet 341 so as to be moved. Accordingly, as illustrated in FIG. 6, the flow channel formed in the inlet insertion part 510 may be opened. Raw water introduced into the inlet insertion part 510 may then flow to the raw water inlet 341.

[112] Also, as illustrated in FIG. 7, when the filtering unit 400 is separated from the case unit 500 so the raw water inlet 341 is separated from the inlet insertion part 510, as illustrated, the opening and closing member 511 may be moved by elastic force of the elastic member 512 in a direction opposite to that described above. Accordingly, as il-

lustrated, the flow channel formed in the inlet insertion part 510 may be closed. Thus, raw water introduced to the inlet insertion part 510 may not flow.

[113] Through such a configuration, when the filtering unit 400 is connected to the case unit 500, as illustrated in FIG. 6, raw water from the raw water source may be introduced to the head unit 300 of the filtering unit 400. When the filtering unit 400 is separated from the case unit 500, as illustrated in FIG. 7, raw water may not be introduced to the head unit 300 of the filtering unit 400.

[114] Thus, without an opening and closing valve, raw water may be supplied to the head unit 300 or supply of raw water to the head unit 300 may be stopped by simply connecting the filtering unit 400 to the case 500 or separating the filtering unit 400 from the case unit 500.

[115] As illustrated in FIG. 6, when the filtering unit 400 is connected to the case unit 500, the foregoing purified water outlet 342 included in the head unit 300 may be inserted into the outlet insertion part 520. Accordingly, as described above and as illustrated in FIG. 6, purified water flowing out of the outlet 220 of the water purifying filter 200 is introduced to the outlet connection portion 322 of the filter connection part 320 of the head unit 300, flows in the purified water outlet 342, and is introduced to the outlet insertion part 520, so as to flow out therefrom to the outside.

[116] As described above and as shown in the embodiment illustrated in FIGS. 4 and 6, the stopping hole 500a may be formed in an upper portion of the case unit 500. As described above and as illustrated, when the filtering unit 400 in which the water purifying filter 200 is connected to the head unit 300 is connected to the case unit 500, the stopping projection 332b formed on the detaching member 332 included in the head unit 300 may be caught in the stopping hole 500a.

[117] Accordingly, when the filtering unit 400 is connected to the case unit 500, the filtering unit 400 is prevented from being separated from the case unit 500. Also, as mentioned above, the raw water inlet 341 and the purified water outlet 342 insertedly connected to the inlet insertion part 510 and the outlet insertion part 520 of the case unit 500, respectively, as the filtering unit 400 is connected to the case unit 500 may not be separated. Thus, as mentioned above, the raw inlet 341 may force the opening and closing member 511 provided in the inlet insertion part 510 to be in a position to open the flow channel formed in the inlet insertion part 510. Accordingly, raw water can be smoothly supplied to the water purifying filter 200. Also, purified water flowing out of the water purifying filter 200 may also smoothly flow out therefrom to the outside.

[118] As shown in the embodiment illustrated in FIGS. 4 and 5, the case unit 500 may have a shape corresponding to the filtering unit 400 to allow the filtering unit 400 to be installed therein. To this end, as shown in the illustrated embodiment, the filter

insertion part 500b may be formed in the case unit 500 to allow the water purifying filter 200 is inserted thereinto when the filtering unit 400 is connected to the case unit 500. In the illustrated embodiment, two filter insertion parts 500b are formed in the case unit 500 so that two water purifying filters 200 can be included in the filtering unit 400. However, the number of the filter insertion parts 500b is not particularly limited and any number of filter insertion parts 500b may be provided as long as it corresponds to the water purifying filters 200 included in the filtering unit 400.

[119] Through such a configuration, as illustrated in FIG. 7, when the filtering unit 400 is separated from the case unit 500, although water is leaked from the filtering unit 400, it is leaked to the case unit 500. Thus, water is prevented from being leaked to a water purifier (not shown), or the like in which the case unit 500 is provided. Accordingly, electronic equipment provided in the water purifier, or the like, may not be broken down and the water purifier, or the like, may not be contaminated.

[120] As shown in the embodiment illustrated in FIG. 9, a water purifier P according to an embodiment of the present invention may include a water purifier housing H and the foregoing water purifying filter assembly module 100.

[121] As shown in the embodiment illustrated in FIG. 9, the foregoing water purifying filter assembly module 100 may be installed in the water purifier housing H. The head unit 300 included in the water purifying filter assembly module 100 may be exposed from an upper surface of the water purifier housing H. Accordingly, the head unit 300 of the water purifying filter assembly module 100 may serve as a cover of the water purifier housing H. Also, as shown in the embodiment illustrated in FIG. 9, the head unit 300 of the water purifying filter assembly module 100 may be exposed to the outside when a top cover C of the water purifier housing H is separated.

[122] As described above, in case of using the water purifying filter assembly module 100 and the water purifier P having the same according to an embodiment of the present invention, when the filtering unit in which one or more water purifying filters are connected to the head unit is connected to the case unit such that it is installed in the case unit, raw water can flow into the filtering unit without a pipe connection operation and purified water filtered by the water purifying filters can flow out therefrom, the filtering unit in which water purifying filters are connected to a head unit can be connected to a case unit such that it is easily installed therein, or separated therefrom, and the water purifying filter can be replaced even in a narrow space. Also, when the filtering unit in which the water purifying filters are connected to the head unit is separated from the case unit, raw water is prevented from flowing into the water purifying filters. Also, when the filtering unit in which the water purifying filters are connected to the head unit is separated from the case unit, although water is leaked, it is leaked to the case unit, thus preventing contamination or an incident due to the

dripping water.

[123] Also, two or more different types of water purifying filters can be connected in series, two or more water purifying filters may not be replaced together, water filtering efficiency by the water purifying filters can be enhanced, and two or more water purifying filters can be connected to appropriate filter connection parts, respectively, among two or more filter connection parts included in the head unit to allow the water purifying filters to be connected thereto.

[124] The water purifying filter assembly module and a water purifier having the same as described above is not limited in its application of the configurations of the foregoing embodiments, but the entirety or a portion of the embodiments can be selectively combined to be configured into various modifications.

Claims

[Claim 1] A water purifying filter assembly module comprising:
a head unit, to or from which one or more water purifying filters are connected or separated, allowing raw water to flow into the water purifying filters and purified water filtered by the water purifying filters to flow out therefrom, when the water purifying filters are connected to the head unit; and
a case unit, to or from which a filtering unit in which the water purifying filters are connected to the head unit is connected or separated so as to be installed therein, allowing raw water to flow into the head unit and purified water from the head unit to flow out therefrom, when the filtering unit is connected to the case unit.

[Claim 2] The water purifying filter assembly module of claim 1, wherein when the filtering unit is separated from the case unit, the filtering unit is lifted upwardly from the case unit.

[Claim 3] The water purifying filter assembly module of claim 1, wherein the head unit comprises:
a head unit main body;
a filter connection part disposed in the head unit main body to allow raw water to flow into the water purifying filters and purified water filtered by the water purifying filters to flow out therefrom, when the water purifying filters are connected; and
a detaching part disposed in the head unit main body to facilitate a connection to or separation from the case unit.

[Claim 4] The water purifying filter assembly module of claim 3, wherein one detaching part is disposed on either side of the head unit main body.

[Claim 5] The water purifying filter assembly module of claim 3, wherein the detaching part includes a detaching member elastically supported by the head unit main body in order to connect the filtering unit to the case unit or separate the filtering unit therefrom.

[Claim 6] The water purifying filter assembly module of claim 5, wherein the detaching part comprises:
an elastic member inserted into an insertion projection formed on a head unit main body; and
a detaching member elastically supported by the elastic member and configured to be caught by the case unit when connected to the case unit and released from the case unit when separated from the case unit.

[Claim 7] The water purifying filter assembly module of claim 6, wherein a handle portion is formed on one side of the detaching member such that the handle portion is inserted into and protruded from a handle hole formed in the head unit main body, and
a stopping projection is formed on the other side of the detaching member such that the stopping projection is inserted into and protruded from an insertion hole formed in the head unit main body and caught by a stopping hole formed in the case unit when connected to the case unit.

[Claim 8] The water purifying filter assembly module of claim 3, wherein the head unit further comprises:
an inlet/outlet part disposed in the head unit main body and allowing raw water introduced to the case unit to flow into the filter connection part and purified water flowing out from the filter connection unit to flow out therefrom through the case unit, when connected to the case unit.

[Claim 9] The water purifying filter assembly module of claim 8, wherein the inlet/outlet part comprises:
a raw water inlet having one side disposed in the head unit main body so as to be connected to an inlet connection portion included in the filter connection part and the other side inserted into an inlet insertion part disposed in the case unit, when connected to the case unit; and
a purified water outlet having one side disposed in the head unit main body so as to be connected to an outlet connection portion included in the filter connection part and the other side inserted into an outlet insertion part provided in the case unit, when connected to the case unit.

[Claim 10] The water purifying filter assembly module of claim 9, wherein a sealing member is disposed on the raw water inlet and the purified water outlet.

[Claim 11] The water purifying filter assembly module of claim 3, wherein the filter connection part comprises:
an inlet connection portion connected to an inlet disposed in the water purifying filter when the water purifying filter is connected; and
an outlet connection portion connected to an outlet disposed in the water purifying filter when the water purifying filter is connected.

[Claim 12] The water purifying filter assembly module of claim 11, wherein the head unit includes two or more filter connection parts,
wherein the filter connection parts are connected by a connection pipe,

each other, and

one side of the connection pipe is connected to the outlet connection portion of one filter connection part and the other side thereof is connected to the inlet connection portion of the other filter connection part.

[Claim 13] The water purifying filter assembly module of claim 3, wherein the head unit includes two or more filter connection parts to allow two or more water purifying filters to be connected to or separated therefrom, at least one of the two or more water purifying filters include an identification projection,

a filter connection part, to which the water purifying filter having the identification projection formed thereon is prevented from being connected, has a different identification projection formed thereon, so that the water purifying filter having the identification projection is not connected to the filter connection part having the different identification projection formed thereon.

[Claim 14] The water purifying filter assembly module of claim 1, wherein the case unit comprises:

the inlet insertion part connected to a raw water source, the raw water inlet portion included in the head unit being inserted thereinto when the filtering unit is connected; and

the outlet insertion part, into which the purified water outlet included in the head unit is inserted, when the filtering unit is connected.

[Claim 15] The water purifying filter assembly module of claim 14, wherein the inlet insertion part includes an opening and closing member opening a flow channel formed in the inlet insertion part when the raw water inlet is inserted therein and closing the flow channel when the raw water inlet is separated.

[Claim 16] The water purifying filter assembly module of claim 15, wherein the opening and closing member is elastically supported by an elastic member provided in the inlet insertion part.

[Claim 17] The water purifying filter assembly module of claim 1, wherein the stopping hole is formed in an upper portion of the case unit to allow a stopping projection formed in the detaching member included in the head unit to be caught therein when the filtering unit is connected.

[Claim 18] The water purifying filter assembly module of claim 1, wherein the case unit has a shape corresponding to the filtering unit to allow the filtering unit to be installed therein.

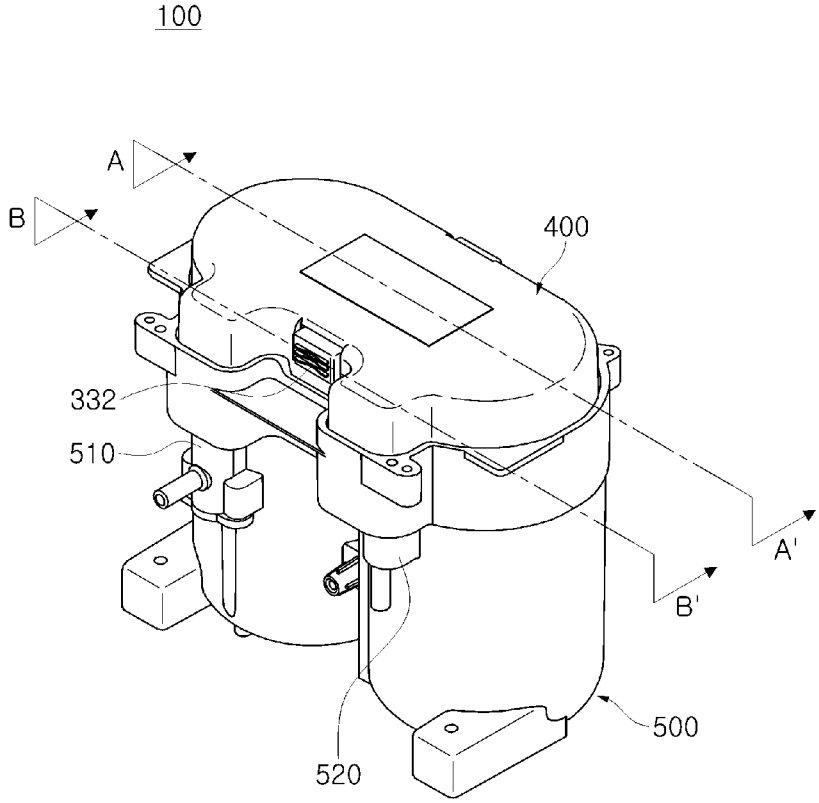
[Claim 19] The water purifying filter assembly module of claim 18, wherein the case unit includes a filter insertion part into which the water purifying filter is inserted when the filtering unit is connected thereto.

[Claim 20] The water purifying filter assembly module of claim 1, wherein the water purifying filter includes a connection protuberance which is caught by a connection protuberance formed on the filter connection part included in the head unit or released therefrom according to a rotation, so that the water purifying filter is connected to or separated from the filter connection part according to rotation.

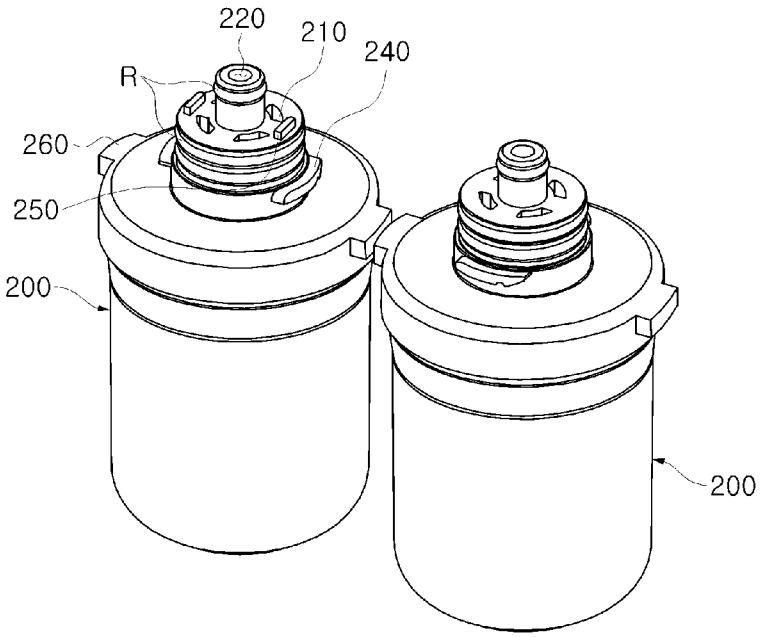
[Claim 21] The water purifying filter assembly module of claim 20, wherein the water purifying filter includes a rotation preventing projection and the filter insertion part formed in the case unit includes a rotation preventing recess allowing the rotation preventing projection to be inserted therein, so that when the water purifying filter is inserted, the rotation preventing projection prevents the water purifying filter from being rotated.

[Claim 22] A water purifier comprising:
a water purifier housing: and
the foregoing water purifying filter assembly module installed in the water purifier housing according to any one of claim 1 to 21,
wherein the head unit included in the water purifying filter assembly module is exposed from an upper surface of the water purifier housing or is exposed to the outside when a top cover of the water purifier housing is separated.

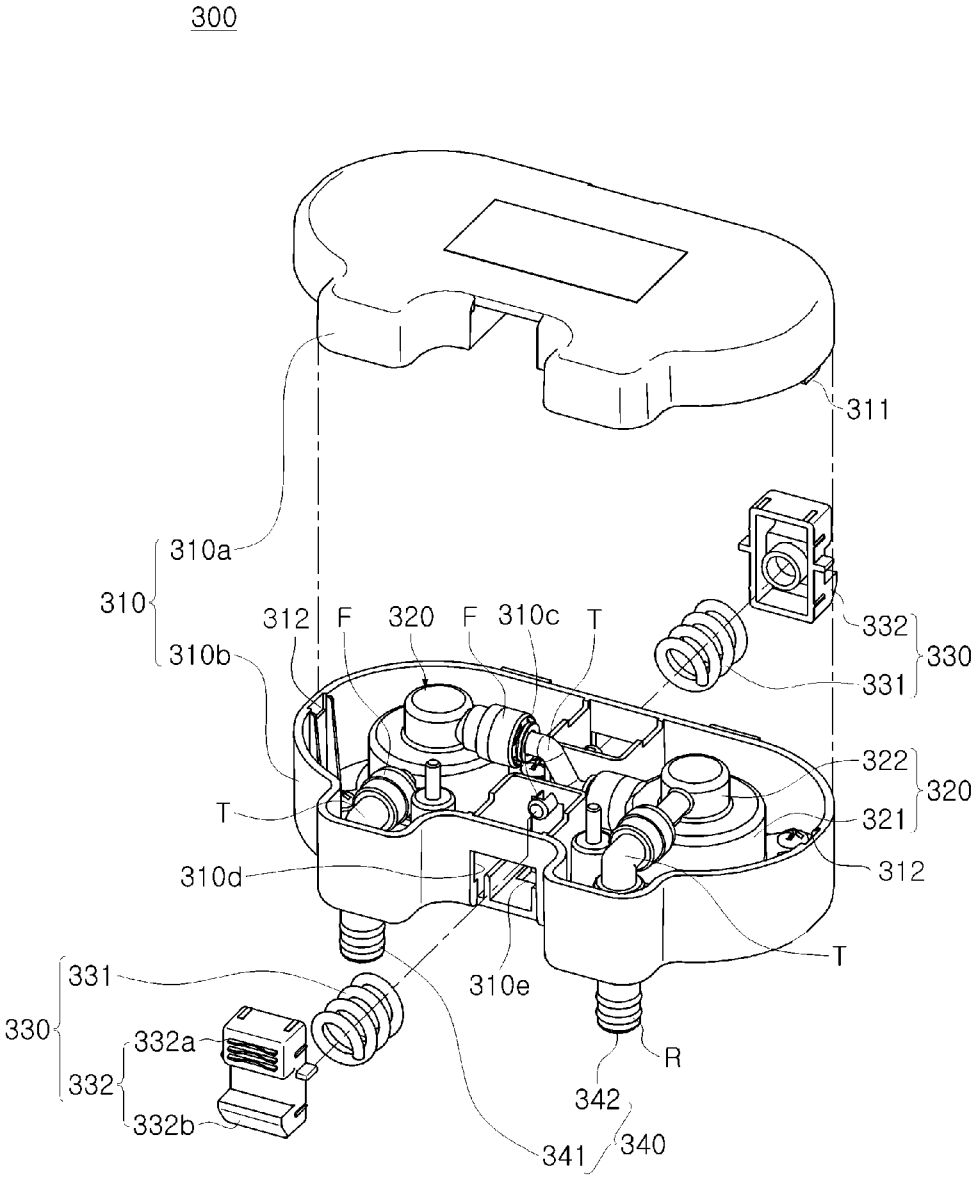
[Fig. 1]



[Fig. 2]



[Fig. 3]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R
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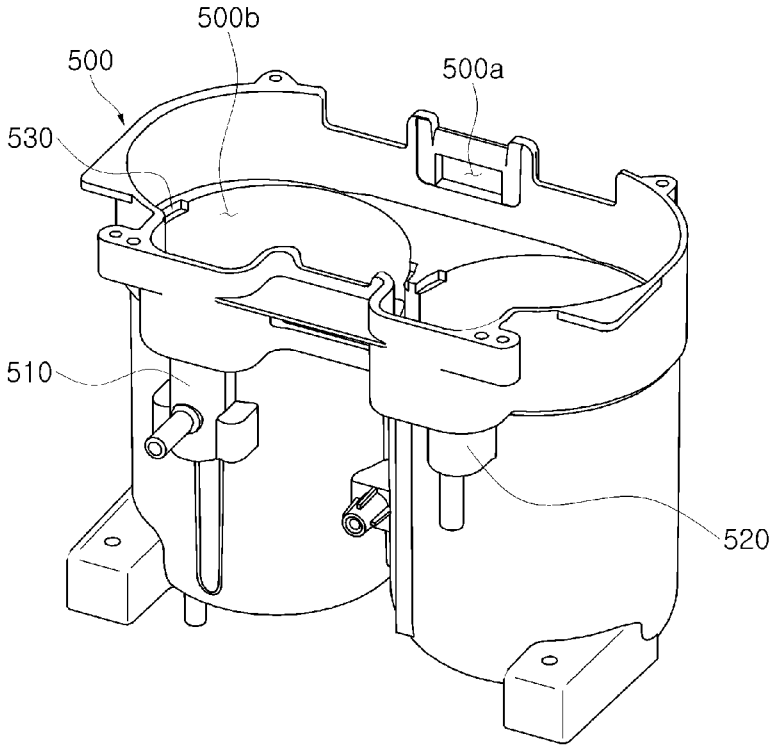
341

[Fig. 4]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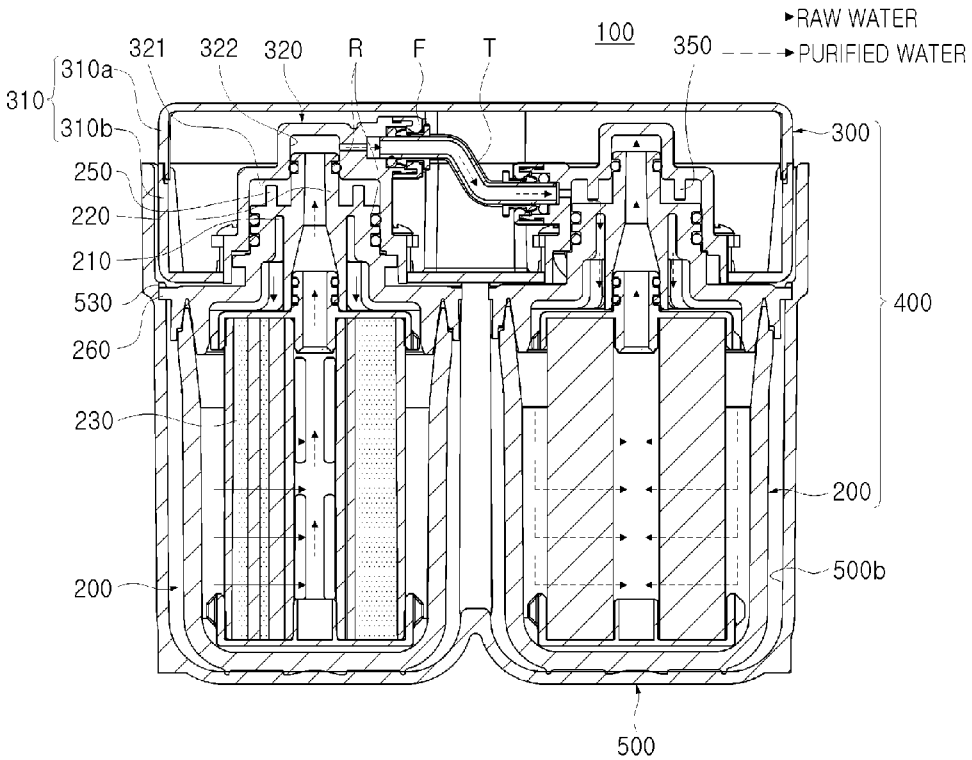
[Fig. 5]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500b
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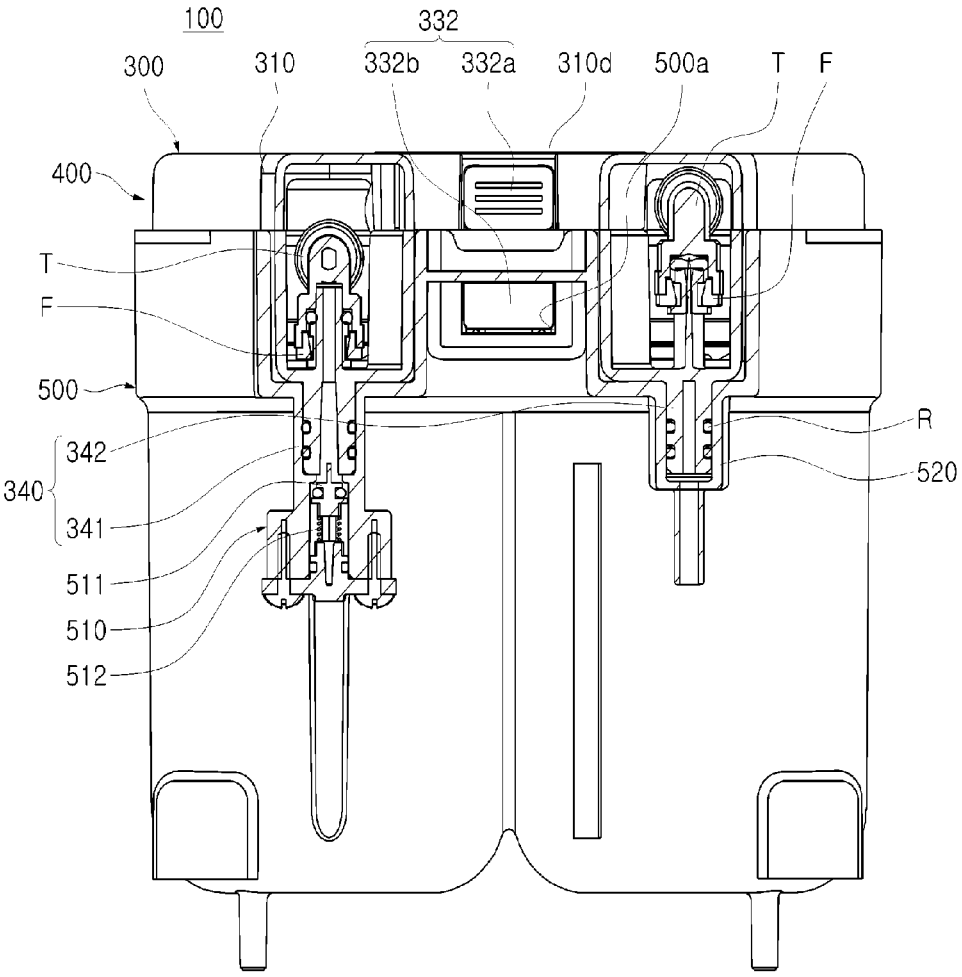
[Fig. 6]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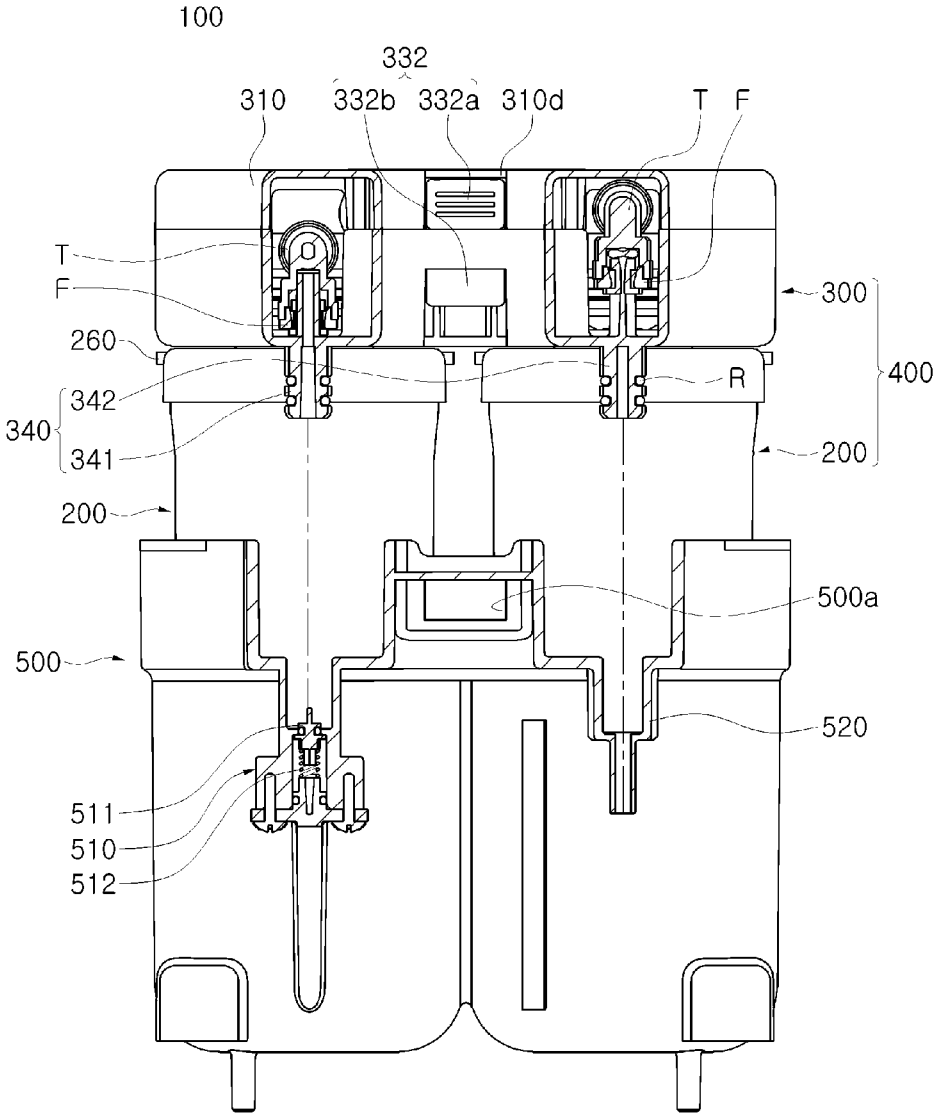
[Fig. 7]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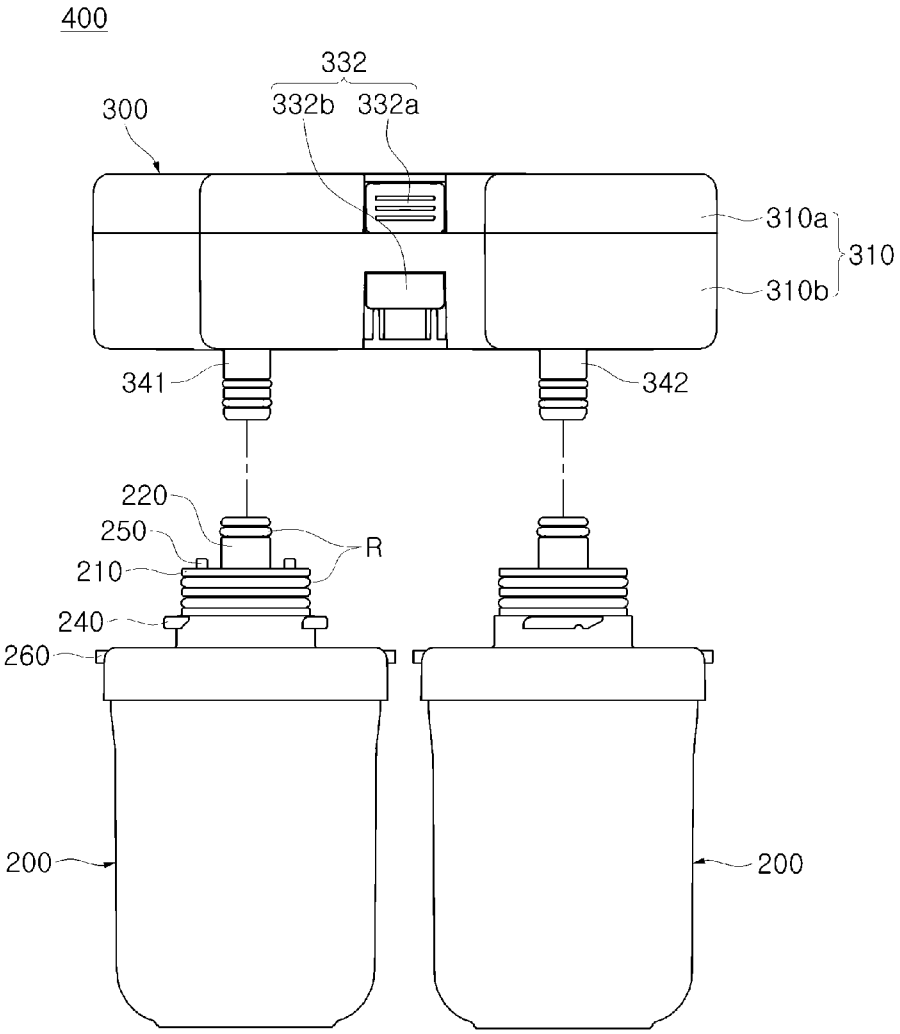
510
512

[Fig. 8]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310b
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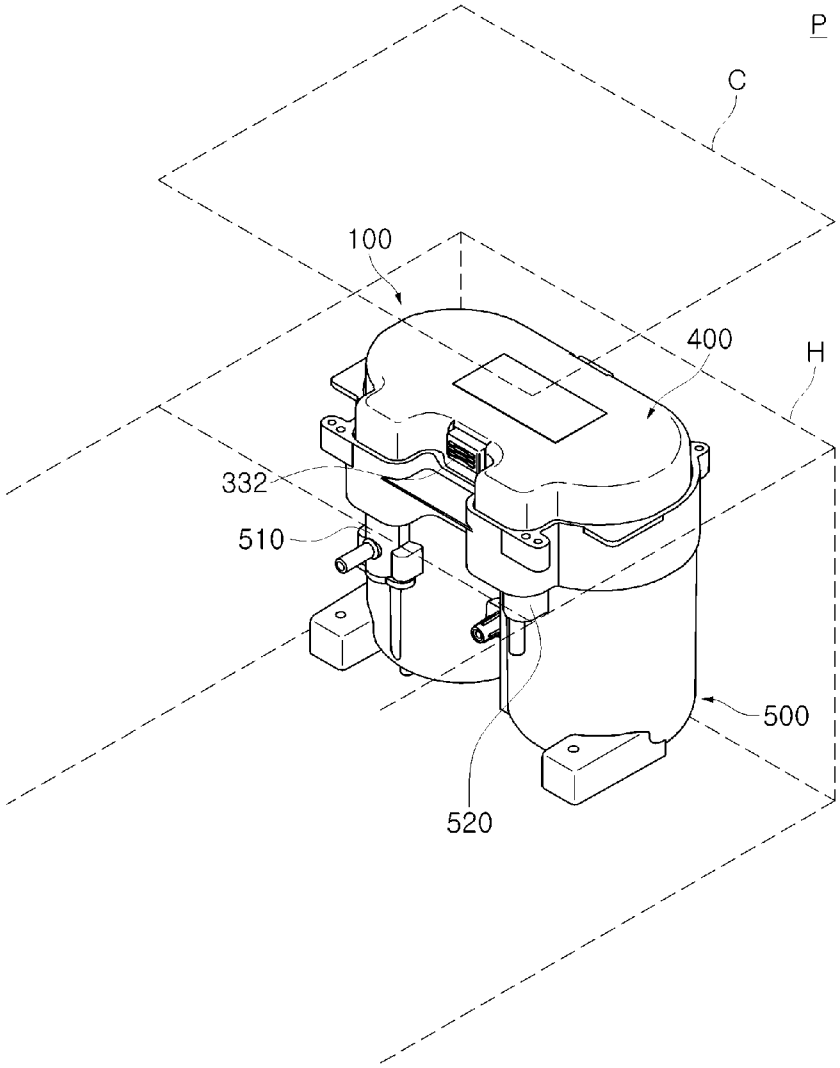
200
200

[Fig. 9]



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2012/011123

A. CLASSIFICATION OF SUBJECT MATTER

BOW 35/30(2006.01)i, BOW 35/00(2006.01)1, BOW 25/02(2006.01)1

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)

B01D 35/30; B01D 27/08; B01D 39/00; B01D 35/00; B01D 15/08

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

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

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

eKOMPASS(KIPO internal) & Keywords: filter, head, case, connect, detach

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	KR 10-2010-0050335 A (W00NGJIN C0WAY CO., LTD.) 13 May 2010 See paragraphs [0025], [0027], [0029], figures 1-3 and claim 1.	22 1-21
Y	US 2008-0047900 Al (REAMSNYDER, C. R. et al.) 28 February 2008 See paragraphs [0021]-[0023], figures 1-4 and claims 1-2, 10.	1-21
A	KR 10-0873294 Bl (WOONGJIN COWAY CO., LTD.) 11 December 2008 See paragraphs [0021]-[0039], figures 1-4 and claims 1-4, 11.	1-22
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☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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14 MARCH 2013 (14.03.2013)	**15 MARCH 2013 (15.03.2013)**

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Information on patent family members

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