(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 371 256 B1

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
03.01.2018 Bulletin 2018/01

(21) Application number: **11002707.5**

(22) Date of filing: **31.03.2011**

(51) Int Cl.:
A47L 15/42 *(2006.01)*

(54) **Dishwasher**

Geschirrspüler

Lave-vaisselle

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

(30) Priority: **31.03.2010 KR 20100029026**

(43) Date of publication of application:
05.10.2011 Bulletin 2011/40

(73) Proprietor: **LG Electronics Inc.**
Yeongdeungpo-gu
Seoul 07336 (KR)

(72) Inventor: **Yoon, Sangheon**
Geumcheon-gu
Seoul 153-802 (KR)

(74) Representative: **Ter Meer Steinmeister & Partner Patentanwälte mbB**
Nymphenburger Straße 4
80335 München (DE)

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Description

BACKGROUND

[0001] Embodiments relate to a dishwasher.

[0002] In general, dishwashers are appliances that spray washing water onto dishes on which food or garbage is stained to wash the dishes.

[0003] In detail, according to such a dishwasher, clean washing water is supplied using a sump disposed at a side of a washing bath, and then a washing water spraying mechanism sprays the washing water onto dishes within the washing bath to wash the dishes. The washing water used for washing the dishes is recovered into the sump, and then, the recovered washing water is supplied again into the washing water spraying mechanism through a filtering device disposed within the sump.

[0004] When the dishes are washed through the above-described processes, the washing water existing in the washing bath and the sump is discharged to the outside. Here, the foreign substances filtered by the filtering device may be discharged together with the washing water to the outside of the dishwasher.

[0005] However, in a dishwasher according to a related art, since foreign substances are continuously accumulated in the filtering device when the dishes are washed, the filtering device may be blocked by the foreign substances.

[0006] Also, since the foreign substances accumulated in the filtering device causes a flow resistance against the washing water, a flow amount and rate of washing water passing through the filtering device may be reduced. As a result, the amount of washing water supplied into the washing water spraying mechanism may be reduced to deteriorate washing performance of the dishwasher. In addition, a washing water pump unit for pumping the washing water may be overloaded.

[0007] Also, when the foreign substances are continuously accumulated in the filtering device, the foreign substances may adhere to at least one surface. As a result, it may be difficult to remove the foreign substances. Therefore, the foreign substances may be decomposed to cause a bad small within the washing bath.

[0008] EP 0 454 640 A1 relates to a device for a dishwasher comprising a tub in which liquid by means of a circulation pump and at least one rotating wash arm is sprayed on the dish. The liquid is collected at the bottom of the tub in order to be distributed from there to a sewage or the like by means of a drain pump. The bottom is provided with a collecting means for waste emanating from the dish. The device comprises a rotating and cutting means cooperating with the collecting means for disintegrating the waste on the collecting means so that the disintegrated waste falls down into a container or the like being in communication with the inlet of the drain pump.

[0009] EP 1 057 445 A2 provides a dishwasher having a wash chamber including a sump. A pump having a rotating element is supported within a pump housing wherein the pump is adapted to draw liquid from the sump through an inlet area and then pump liquid to the wash chamber. A particle chopping assembly is supported in the inlet area upstream of the rotating element, the particle sizing assembly including a particle screen rotatably supporting drive shaft which drivingly supports a chopping blade adjacent the particle screen. The drive shaft has a coupling end which detachably couples to the rotating element. The coupling between the chopping blade and the rotating element is capable of accommodating axial tolerance with regard to the axial position of the rotating element.

SUMMARY

[0010] The above-identified problems are solved by the present invention. In particular, embodiments of the present invention provide a dishwasher in which a structure of a sump is improved to prevent a filter from being blocked by foreign substances.

[0011] Embodiments of the present invention also provide a dishwasher in which at least one surface of a filter is cleaned to remove foreign substance from the filter.

[0012] The object is solved by the features of the independent claim.

[0013] Preferably, a dishwasher includes: a washing space in which a rack for receiving dishes and a nozzle for spraying washing water are disposed; a sump in which the washing water supplied into the washing space is collected; a filter part disposed in the sump to filter foreign substances contained in the washing water; a rotation part including a blade rotatably contacting the filter part; a driving part providing a driving force to the rotation part; and a rotation shaft separably coupled to the rotation part, wherein the rotation shaft is for transmitting the driving force of the driving part to the rotation part, the rotation shaft comprising a hook selectively hooked to the rotation part; a shaft coupling part disposed on the rotation part, the shaft coupling part being coupled to the rotation shaft; and a hook rib disposed inside the shaft coupling part, the hook rib being hooked to the hook.

[0014] The details of one or more embodiments are set forth in the accompanying drawings and the description below. Other features will be apparent from the description and drawings, and from the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015]

Fig. 1 is a sectional view of a dishwasher according to an embodiment.

Fig. 2 is a sectional view illustrating a portion of a sump according to an embodiment.

Fig. 3 is an exploded perspective view of a filter part and a rotation unit according to an embodiment.

Fig. 4 is an exploded perspective view illustrating a mounting structure of a rotation unit according to an

embodiment.

Fig. 5 is an exploded perspective view of a rotation part according to an embodiment.

Fig. 6 is a sectional view illustrating an operation of the rotation unit according to an embodiment.

Fig. 7 is a perspective view illustrating a coupled state of a rotation part and a driving part according to an embodiment.

Fig. 8 is a perspective view illustrating a coupled state of the driving part and a rotation shaft according to an embodiment.

Fig. 9 is a side view illustrating a coupled state of the driving part and the rotation shaft according to an embodiment.

Fig. 10 is a front view illustrating a coupled state of the driving part and the rotation shaft according to an embodiment.

Fig. 11 is a sectional view taken along line I-I' of Fig. 4.

Fig. 12 is a sectional view taken along line II-II' of Fig. 7.

Fig. 13 is a sectional view illustrating a coupled state of the rotation part and the rotation shaft according to an embodiment.

Fig. 14 is a sectional view illustrating a coupled state of a rotation part and a rotation shaft according to another embodiment.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0016] Reference will now be made in detail to the embodiments of the present disclosure, examples of which are illustrated in the accompanying drawings.

[0017] In the following detailed description of the preferred embodiments, reference is made to the accompanying drawings that form a part hereof, and in which is shown by way of illustration specific preferred embodiments in which the invention may be practiced. These embodiments are described in sufficient detail to enable those skilled in the art to practice the invention, and it is understood that other embodiments may be utilized and that logical structural, mechanical, electrical, and chemical changes may be made without departing from the scope of the invention. To avoid detail not necessary to enable those skilled in the art to practice the invention, the description may omit certain information known to those skilled in the art. The following detailed description is, therefore, not to be taken in a limiting sense, and the scope of the present invention is defined only by the appended claims.

[0018] Fig. 1 is a sectional view of a dishwasher according to an embodiment.

[0019] Referring to Fig. 1, a dishwasher 1 according to an embodiment includes a case 10 defining an outer appearance thereof, a tub 11 received in the case 10 to define a washing bath, a door 12 disposed on a front surface of the tub 11 to open or close the washing bath, and a sump 20 disposed under the tub 11 to store washing water.

[0020] Lower and upper racks 14 and 13 in which dishes are received are disposed within the tub 11. The upper rack 13 is spaced a predetermined distance from an upper portion of the lower rack 14. The upper and lower racks 13 and 14 are disposed on an inner surface of the tub 11 and guided by a guide rail (not shown) so as to be taken out of the tub 11.

[0021] Washing pumps 30 and 32 for supplying the washing water from the sump 20 to the washing bath are disposed in the sump 20. The washing pumps 30 and 32 include a washing motor 30 for providing a driving power and an impeller part 32 coupled to the washing motor 30 to provide a pumping force.

[0022] A lower nozzle 17, an upper nozzle 16, and a top nozzle 15, which spray the washing water supplied from the sump 20 into the washing bath are disposed above the sump 20.

[0023] In detail, the lower nozzle 17 is coupled to an upper surface of the sump 20 to spray the washing water to a lower side of the washing bath. The sprayed washing water is sprayed toward dishes mounted on the lower rack 14. Also, a lower nozzle coupling part 19 coupled to the lower nozzle 17 is disposed in the sump 20.

[0024] The upper nozzle 16 is disposed at a center of the washing bath to spray the washing water toward the upper rack 13. The top nozzle 15 is disposed about a ceiling to spray the washing water downward.

[0025] Also, a washing water guide 40 for moving the washing water supplied from the washing pumps 30 and 32 is disposed above the sump 20. The washing water moved by the washing water guide 40 may be sprayed toward the upper rack 13 through the top and upper nozzles 15 and 16.

[0026] Fig. 2 is a sectional view illustrating a portion of a sump according to an embodiment. Fig. 3 is an exploded perspective view of a filter part and a rotation unit according to an embodiment.

[0027] Referring to Figs. 2 and 3, the sump 20 according to an embodiment includes a sump cover 22 defining a top surface of the sump 20, a filter housing 25 disposed under the sump cover 22 to receive filter parts 110 and 130, and a pre-filter 50 for primarily filtering the washing water supplied into the sump cover 22. The washing water passing through pre-filter 50 may be introduced into the filter parts 110 and 130.

[0028] In detail, the filter housing 25 has a downwardly recessed shape to provide a filter chamber in which the filter parts 110 and 130 are received.

[0029] A washing water inflow part 25a for allowing the washing water to flow into the filter parts 110 and 130 is disposed at an upper portion of the filter housing 25, and a pump inflow part 28 for allowing the washing water passing through the filter parts 110 and 130 to flow into the washing pumps 30 and 32 is disposed at a lower portion of the filter housing 25. The pump inflow part 28 extends to the outside of the filter housing 25.

[0030] A water discharge part 29 for discharging for-

eign substances and the washing water during the discharge process of the washing water is disposed at a lower end of the filter housing 25. The discharge part 29 extends to the outside of the filter housing 25 in a direction opposite to that of the pump inflow part 28. Also. The water discharge part 29 is connected to a water discharge pump (not shown).

[0031] A discharge hole 29a for discharging the washing water into the water discharge part 29 is defined in the filter housing 25. The washing water within the filter housing 25 may be discharged through the discharge hole 29a and introduced into the water discharge pump (not shown) via the water discharge part 29.

[0032] The filter parts 110 and 130 include a first filter 110 for filtering foreign substances having a relatively large volume from the washing water and a second filter 130 for performing an additional filtering process with respect to the washing water. Here, each of the filter parts 110 and 130 may have a cylindrical shape.

[0033] In detail, the first filter 110 includes a filter body 111 defining an outer appearance thereof and a filter support 115 extending along an outer circumference surface of the filter body 111 to support the first filter 110 on the sump cover 22. The filter support 115 may be disposed so that it is supported on the pre-filter 50. The first filter 110 may be received in the second filter 130.

[0034] A first through-hole 112 for filtering foreign substances contained in the washing water is defined in the filter body 111.

[0035] A second through-hole 132 for filtering foreign substances contained in the washing water is defined in the second filter 130. The second through-hole 132 may have a mesh shape which is denser than that of the first through-hole 112.

[0036] The second filter 130 includes a lower end 133 coupled to the filter housing 25 at a lower portion thereof. The lower end 133 may be coupled to a filter coupling part 27 disposed at a lower portion of the filter housing 25.

[0037] A rotation unit 200 for cleaning foreign substances accumulated on the second filter 130 is disposed within the filter housing 25. Hereinafter, constitutions of the rotation unit 200 will be described with reference to the accompanying drawings.

[0038] Fig. 4 is an exploded perspective view illustrating a mounting structure of a rotation unit according to an embodiment. Fig. 5 is an exploded perspective view of a rotation part according to an embodiment. Fig. 6 is a sectional view illustrating an operation of the rotation unit according to an embodiment.

[0039] Referring to Figs. 4 to 6, a rotation unit 200 according to an embodiment includes a rotatable rotation part 210 and a driving motor 250 serving as a driving part to provide a driving power to the rotation part 210.

[0040] The rotation part 210 is received in a space between the first filter 110 and the second filter 130. That is, the rotation part 210 may be disposed outside the first filter 110, and at least one portion of the rotation part 210 may contact an inner surface of the second filter 130.

[0041] In detail, the rotation part 210 includes a frame 211 defining an outer appearance thereof, a blade 215 disposed on an outer circumference surface of the frame 211 to contact the second filter 130, and a blade fixing part 217 for fixing the blade 215 to the frame 211.

[0042] The frame 211 has a shape in which a plurality of members having a ring shape are vertically arranged to form a column shape on the whole. The blade 215 is disposed in a length direction of the frame 211. The plurality of blades 215 may be coupled to the outside of the frame 211 with the substantially same distance as each other.

[0043] The blade fixing part 217 includes a first fixing part 217a for supporting one side of the blade 215 and a second fixing part 217b for supporting the other side of the blade 215. That is, the blade 215 is disposed between the first and second fixing parts 217a and 217b.

[0044] A coupling rib 218 is disposed on the first fixing part 217a, and a coupling hole 219 to which the coupling rib 218 is coupled is defined in the second fixing part 217b. The coupling rib 218 and the coupling hole 219 may be provided in plurality along a length direction of each of the fixing parts 217a and 217b.

[0045] A through-hole 216 is defined in a position of the blade 215 corresponding to the coupling rib 218 and the coupling hole 219. In a state where the blade 215 is coupled between the first and second fixing parts 217a and 217b, the coupling rib 218 may pass through the through-hole 216 and be coupled to the coupling hole 219.

[0046] Also, in a state where the blade 215 is coupled to the blade fixing part 217, at least one portion of the blade 215 may further protrude outside the blade fixing part 217.

[0047] The blade 215 may be formed of rubber or plastic. Furthermore, the blade 215 may be formed of a material elastically deformable in a predetermined direction. Thus, when the rotation part 210 is rotated in a state where the blade 215 contacts the second filter 130, the blade 215 may be deformed in a predetermined direction.

[0048] The driving motor 250 for providing a driving force to rotate the rotation part 210 and a rotation shaft 220 for transmitting the driving force of the rotation motor 250 to the rotation part 210.

[0049] A motor shaft 252 coupled to the rotation shaft 220 is disposed on the driving motor 250. A shaft housing 240 receiving the rotation shaft 220 and a sealing part 230 disposed inside the shaft housing 240 to support the rotation shaft 220 are disposed outside the rotation shaft 220.

[0050] The rotation shaft 220 coupled to the driving motor 250 passes through a bottom surface of the filter housing 25 and is coupled to the rotation part 210. The rotation part 210 includes a shaft coupling part 213 in which the rotation shaft 220 is received and a reinforcing rib 214 extending from the shaft coupling part 213 toward the frame 211 to reinforce a strength of the shaft coupling part 213.

[0051] The shaft coupling part 213 has a hollow shape to allow the rotation shaft 220 to be coupled thereto. The reinforcing rib 214 radially extends from the shaft coupling part 213 and is coupled to an inner surface of the rotation part 210.

[0052] An operation of the rotation unit according to an embodiment will be described with reference to Fig. 6.

[0053] The driving motor 250 may be a bi-directional motor providing a rotation force in both directions (clockwise and counter clockwise directions). Thus, when a power is supplied into the rotation motor 250, the rotation shaft 220 may be rotated in an "a" direction or "b" direction. As a result, the rotation part 210 may be rotated in the same direction as that of the rotation shaft 220.

[0054] Here, the rotation motor 250 may be controlled to be rotated in the "a" or "b" direction according to a preset period.

[0055] When the rotation part is rotated, the blade 215 may be rotated in the clockwise or counter clockwise direction in the state where the blade 215 contacts the inner circumference surface of the second filter 130. As described above, when the blade 215 scratches the second filter 130, the foreign substances inserted in the second filter 130 may be separated from the second filter 130.

[0056] Thus, since it prevent the second filter 130 from being blocked by the foreign substances, the washing water may smoothly flow. As described above, since the rotation unit 200 has a function capable of cleaning the second filter 130, the rotation unit 200 may be called "a cleaning unit".

[0057] A time point at which the driving motor 250 is operated will be described below.

[0058] A driving process of the dishwasher may include a washing process, a rinsing process, and a drying process. The washing process includes a water supply process, a washing process for washing dishes using the supplied washing water, and a water discharge process for discharge the washing water. A process in which the washing water is introduced into the sump and filtered and then introduced again into the washing bath may be repeatedly performed several times in the washing process.

[0059] Among the processes of the dishwasher, the rotation part 210 may be rotated before a time point at which the water discharge process starts. That is, the water discharge pump (not shown) may be operated after the driving motor 250 is operated.

[0060] When the driving motor 250 is operated and the water discharge pump (not shown) is operated in a state where the foreign substances are separated from the filter parts 110 and 130 by the rotation part 210, the foreign substances together with the washing water may be easily discharged through the water discharge part 29.

[0061] The driving motor 250 may be operated in the first washing process among the washing process. Since a relatively large amount of foreign substances is collected in the first washing process and thus possibility in which the filtered foreign substances are inserted into the filter parts 110 and 130 is increased, the rotation part 210 may be rotated to separate the foreign substances from the filter parts 110 and 130.

[0062] On the other hand, in the rinsing process in which a relatively small amount of foreign substances is collected, the driving motor 250 may be stopped or operated at low frequency.

[0063] Fig. 7 is a perspective view illustrating a coupled state of a rotation part and a driving part according to an embodiment. Fig. 8 is a perspective view illustrating a coupled state of the driving part and a rotation shaft according to an embodiment. Fig. 9 is a side view illustrating a coupled state of the driving part and the rotation shaft according to an embodiment. Fig. 10 is a front view illustrating a coupled state of the driving part and the rotation shaft according to an embodiment.

[0064] Referring to Figs. 7 to 10, the rotation unit 200 according to an embodiment includes the driving motor 250 for providing a driving force, the rotation part 210 rotated by the driving force of the driving motor 250, and the rotation shaft 220 for transmitting the driving force of the driving motor 250 to the rotation part 210.

[0065] In detail, the driving motor 250 includes a housing coupling part for coupling the driving motor 250 to the housing 25 and a terminal part 254 extending to a side of the driving motor 250 to supply a power.

[0066] The rotation shaft 220 extends upward from the driving motor 250. As described above, the rotation shaft 220 is coupled to the motor shaft 252 and separably coupled to the inside of the shaft coupling part 213.

[0067] The rotation shaft 220 includes a body part 221 having an approximately cylindrical shape and coupled to the motor shaft 252 and a hook part 223 extending upward from the body part 221 and coupled to the inside of the shaft coupling part 213.

[0068] Here, as shown in Fig. 8, the hook part 223 may have a shape having a non-uniform rotation radius. When viewed from an upper side, the hook part 223 has a shape similar to an approximately rectangular shape.

[0069] The hook part 223 has a sectional area less than that of the body part 221. Also, the hook part 223 may be disposed inside the shaft coupling part 213.

[0070] A support part 222 for supporting the rotation part 210 is disposed on a boundary between the body part 221 and the hook part 223. The support part 222 defines an upper end of the body part 221 and a lower end of the hook part 223.

[0071] The support part 222 has a diameter equal to that of the body part 221. The hook part 223 has a shape cut inward from an outer circumference surface of the support part 222 and extending upward.

[0072] The hook part 223 includes first and second hooks 225 on which the rotation part 210 is hooked.

[0073] In detail, an inwardly recessed first recessed part 224 is defined in one side of the hook part 223. The first hook 225 may be defined as a hook disposed on an upper end of the first recessed part 224.

[0074] An inwardly recessed second recessed part

227 is defined in the other side of the hook part 223. The second hook 228 may be defined as a hook disposed on an upper end of the second recessed part 227.

[0075] The first and second recessed parts 224 and 227 face each other with respect to an internal center (center of gravity) of the hook part 223.

[0076] As shown in Fig. 9, the second recessed part 227 and the extending second hook 228 may form a bent portion to have an approximately " r" shape. Also, as shown in Fig. 10, the first recessed part 224 and the extending first hook 225 may form a bent portion to have an approximately "¬" shape.

[0077] Fig. 11 is a sectional view taken along line I-I' of Fig. 4.

[0078] Referring to Fig. 11, the rotation part 210 according to an embodiment includes a plurality of frames 211 having an approximately ring shape. The plurality of frames 211 may be vertically spaced from each other. The rotation part 210 may have an approximately cylindrical shape with respect to the frames 211.

[0079] The rotation part 210 further includes a plurality of blades 215 respectively extending outward from the frames 211 and a blade fixing part 217 for coupling the blades 215 to the frames 211.

[0080] The blades 215 contact an inner surface of the second filter 130. Also, when the rotation part 210 is rotated, the blades may remove the foreign substances accumulated on the second filter 130.

[0081] Also, the rotation part 210 includes a shaft coupling part 213 to which the rotation shaft 220 is coupled and a plurality of reinforcing ribs 214 extending from the shaft coupling part 213 toward the frames 211.

[0082] The shaft coupling part 213 is disposed at an approximately central portion of the frames 211. Also the shaft coupling part 213 extends upward from a lower end of the rotation part 210. The shaft coupling part 213 has a hollow shaft having a diameter greater than that of the rotation shaft 220 to allow the rotation shaft 220 to be inserted therein.

[0083] The reinforcing ribs 214 extend from the shaft coupling part 213 in a radius direction of the frames 211. Also, the reinforce ribs 214 may be provided in plurality in a direction in which the blades 215 are disposed.

[0084] A hook rib 270 on which the rotation shaft 220 is hooked is disposed inside the shaft coupling part 213. The hook rib 270 may be provided in plurality in direction facing each other. Also, the hook rib 270 may protrudes from an inner circumference surface of the shaft coupling part 213.

[0085] The hook rib 270 includes a hook support part 272 protruding along the inner circumference surface of the shaft coupling part 213 to support the first and second hooks 225 and 228. The hook support part 272 may have the approximately same curvature radius as that of the shaft coupling part 213.

[0086] The hook part 223 of the rotation shaft 220 may be rotatably disposed inside the hook support part 272 in a state where the first and second hooks 225 and 228 are supported by the hook support part 272.

[0087] The hook rib 270 further includes a stopper 274 protruding from an end of a side of the hook support part 272 toward a center direction of the shaft coupling part 213.

[0088] The stopper 274 prevents the rotation shaft 220 from idling within the shaft coupling part 213 in a state where the rotation shaft 220 is rotated at a predetermined angle.

[0089] That is, the rotation part 210 is not rotated any more in itself by interfering with the stopper 274 after the rotation part 210 is rotated at a predetermined angle to assemble (couple) the rotation part 210 with the rotation shaft 220 in a state where the rotation part 210 is coupled to the rotation shaft 220. Here, the "predetermined angle" may be a preset angle.

[0090] The hook part 223 includes a first interference part 224a disposed on a side of the first recessed part 224 and a second interference part 227a disposed on a side of the second recessed part 227.

[0091] The stopper 274 may interfere with the first or second interference part 224a or 227a according to a rotation direction of the rotation shaft 220. Also, the rotation shaft 220 and the rotation part 210 are rotated together with each other after the rotation shaft 220 interferes with the stopper 274.

[0092] Also, the hook rib 270 further include a support coupling part 276 supported by the support part 222. The support coupling part 276 may be defined as a lower end of the hook rib 270.

[0093] Fig. 12 is a sectional view taken along line II-II' of Fig. 7. Fig. 13 is a sectional view illustrating a coupled state of the rotation part and the rotation shaft according to an embodiment.

[0094] Referring to Figs. 12 and 13, an operation of the rotation part 210 and the rotation shaft which are coupled to each other will be described below.

[0095] Fig. 12 illustrates a state in which the rotation part 210 is moved downward toward the rotation shaft 220 and then inserted into the outside of the rotation shaft 220. The rotation part 210 is inserted in a state where the rotation shaft 220 is disposed in one direction. Here, the rotation part 210 and the rotation shaft 220 are not hooked (coupled) with each other.

[0096] In the state shown in Fig. 12, when the driving motor 250 is operated, the rotation shaft 220, i.e., the hook part 223 may be rotated at a predetermined angle. Here, the hook part 223 and the rotation part 210 do not interfere with each other. Thus, the rotation shaft 220 is independently rotated.

[0097] When the rotation shaft 220 is rotated at the predetermined angle, the hook part 223 interferes with the stopper 274. That is, the hook part 223 interferes with the stopper 274 in a state where the rotation shaft 220 is disposed in the other direction.

[0098] After the hook part 223 and the stopper 274 interfere with each other, the rotation shaft 220 may be rotated together with the rotation part 210.

[0099] Since the plurality of hook ribs 270 are disposed to face each other, the rotation shaft 220 may be hooked to the rotation part 210 by any one of the hook ribs 270 even though the driving motor 250 is operated in a clockwise or counter clockwise direction.

[0100] For example, when the driving motor 250 is rotated in the clockwise direction, the first interference part 224a may be hooked to one hook rib 270 of the plurality of hook ribs, i.e., one stopper 274.

[0101] On the other hand, when the driving motor 250 is rotated in the counter clockwise direction, the second interference part 227a may be hooked to the other hook rib 270 of the plurality of hook ribs, i.e., the other stopper 274.

[0102] As described above, if a user inserts the rotation part 210 into the rotation shaft 220, the rotation shaft 220 and the rotation part 210 are hooked to each other while the driving motor 250 is rotated.

[0103] To separate the rotation part 210, the rotation part 210 may be rotated in the direction shown in Fig. 12 to release the hooked state of the rotation part 210 and the rotation shaft 220 and then left the rotation part 210.

[0104] Thus, the separated rotation part 210, i.e., the blades 215 may be cleaned. Therefore, the foreign substances accumulated on the blades 215 may be effectively removed.

[0105] In summary, the rotation part 210 and the rotation shaft 220 may be selectively hooked to each other according to a direction in which the rotation part 210 and the rotation shaft 220 are coupled.

[0106] According to the above-described configurations, the filter parts 110 and 130 are cleaned during the operation of the rotation unit 200. Also, to clean the blades 210, the rotation part 210 may be easily separated.

[0107] Another embodiment is proposed.

[0108] The present disclosure may be applied to a case in which the driving motor 250 is a unidirectional rotation motor. When the driving motor 250 is a motor which is rotated only in a clockwise direction, one hook rib 270 may be disposed at a position at which the hook rib 270 is hooked to the rotation shaft 220.

[0109] In this case, the rotation part 210 may be rotated in a relatively counter clockwise direction (a direction opposite to the rotation direction of the driving motor) with respect to the rotation shaft 250 and hooked to the rotation shaft 250.

[0110] Fig. 14 is a sectional view illustrating a coupled state of a rotation part and a rotation shaft according to another embodiment.

[0111] Referring to Fig. 14, a user inserts a rotation part 210 downward toward a rotation shaft 220. Then, the rotation part 210 may be rotated in one direction to hook the rotation part 210 to the rotation shaft 220.

[0112] When the driving motor 250 is a bi-directional motor, the rotation shaft 220 may be hooked by any one of a plurality of hook ribs 270. Thus, a rotation direction of a rotation part 210 for coupling is not important.

[0113] However, when the driving motor 250 is a unidirectional motor which is rotated only in a clockwise direction, the rotation part 210 may be rotated in a counter clockwise direction to hook the rotation part 210 to the rotation shaft 220.

[0114] Since a process for separating the rotation part 210 is equal to that described in the above-described embodiment, its description will be omitted herein.

[0115] As described above, since the rotation unit for cleaning the filter, i.e., the rotation part and the blade are separably coupled to the rotation shaft without using a separate coupling member, the cleaning process of the rotation unit may be easily performed.

[0116] According to the dishwasher according to the embodiments, since the rotation unit is disposed on at least one side of the filter part to clean the foreign substances accumulated on the filter part, a phenomenon in which the filter part is blocked by the foreign substances may be prevented.

[0117] Also, since the blade for scratching the filter part is separably coupled to the driving part, the cleaning process of the blade may be effectively performed.

[0118] Also, since the blade is coupled to the driving part while it is rotated by a manual force or a force of a motor, the blade may be easily assembled or disassembled without using a separate coupling member.

[0119] Also, since the foreign substances existing on the filter are effectively cleaned, the washing water may smoothly flow to improve the washing performance of the dishwasher.

[0120] Also, since the foreign substances are removed from a surface of the filter to prevent the filter from being blocked, the filtering performance of the washing water may be improved.

[0121] Also, since the foreign substances separated from the filter are discharged to the outside of the dishwasher during the water discharge process, it may prevent a bad small from occurring by decomposition of the foreign substances.

[0122] Also, the washing performance of the dishwasher may be improved and the foreign substances may be easily discharged. Therefore, reliability of the product may be improved.

[0123] Although embodiments have been described with reference to a number of illustrative embodiments thereof, it should be understood that numerous other modifications and embodiments can be devised by those skilled in the art that will fall within the scope of the principles of this disclosure. More particularly, various variations and modifications are possible in the component parts and/or arrangements of the subject combination arrangement within the scope of the disclosure, the drawings and the appended claims. In addition to variations and modifications in the component parts and/or arrangements, alternative uses will also be apparent to those skilled in the art.

Claims

1. A dishwasher comprising:

a washing space in which a rack for receiving dishes and a nozzle (15, 16, 17) for spraying washing water are disposed;
a sump (20) in which the washing water supplied into the washing space is collected;
a filter part (110, 130) disposed in the sump to filter foreign substances contained in the washing water;
a rotation part (210) comprising a blade (215) rotatably contacting the filter part;
a driving part (250) providing a driving force to the rotation part (210); and
a rotation shaft (220) separably coupled to the rotation part (210), wherein the rotation shaft (220) is for transmitting the driving force of the driving part (250) to the rotation part (210);

characterised in that:

the rotation shaft (220) comprises a hook selectively hooked to the rotation part (210); and

the dishwasher further comprises:

a shaft coupling part (213) disposed on the rotation part (210), the shaft coupling part (213) being coupled to the rotation shaft (220); and a hook rib (270) disposed inside the shaft coupling part (213), the hook rib (270) being hooked to the hook (225,228).

2. The dishwasher according to claim 1, wherein the rotation shaft (220) extends upward from the driving part (250), and the rotation part (210) is inserted into the outside of the rotation shaft (220).

3. The dishwasher according to claim 1, wherein the driving part (250) is a bi-directional motor rotatable in clockwise and counter clockwise directions, and
when the driving part (250) is rotated in the clockwise or counter clockwise directions, the hook (225, 228) is hooked to the rotation part (210).

4. The dishwasher according to claim 1, wherein the driving part (250) is a unidirectional motor rotatable in clockwise and counter clockwise directions, and
when the rotation part (250) is rotated in a direction opposite to a rotation direction of the unidirectional motor, the rotation part (250) is hooked to the hook (225, 228).

5. The dishwasher according to claim 1, wherein the hook rib comprises:

a hook support part (272) disposed on an inner circumference surface of the shaft coupling part (213), the hook support part (272) supporting the hook (225, 228); and
a stopper (274) interfering with the rotation shaft when the rotation shat is rotated at a preset angle.

6. The dishwasher according to claim 1, wherein the hook rib (270) is provided in plurality, and
when the driving part (250) is rotated in the clockwise or counter clockwise directions, one hook rib (270) of the plurality of hook ribs (270) is coupled to the hook (225, 228).

7. The dishwasher according to claim 6, wherein the plurality of hook ribs (270) are disposed in directions facing each other.

8. The dishwasher according to claim 1, wherein the rotation shaft (220) comprises:

a body part (221) coupled to a motor shaft (252) of the driving part (250),
a hook part (223) having a sectional area less than that of the body part (221), the hook part (223) comprising a hook (225; 228); and
and a support part (222) defining a boundary between the body part (221) and the hook part (223), the support part supporting the rotation part (210),

9. The dishwasher according to claim 8, wherein the support part (222) has the same diameter as that of the body part (221), and the hook part (223) has a shape cut inward from an outer circumference surface of the support part (222).

10. The dishwasher according to claim 1, wherein the hook part (223) comprises a recessed part (224, 227) recessed inward from an outer circumference surface, and the hook (225, 228) is disposed on an end of a side of the recessed part.

11. The dishwasher according to claim 10, wherein the recessed part (224, 227) and the extending hook (225, 228) form a bent part.

12. The dishwasher according to claim 1, wherein the hook (225, 228) is provided in plurality.

13. The dishwasher according to claim 1, wherein the filter part comprises:

a first filter (110); and
a second filter (130) receiving the first filter (110) therein, the second filter (130) additionally filtering the washing water passing through the first

filter (110).

14. The dishwasher according to claim 13, wherein the rotation part (210) is disposed in a space between the first filter (110) and the second filter (130).

Patentansprüche

1. Geschirrspüler, der Folgendes umfasst:

einen Spülraum, in dem ein Gestell zum Aufnehmen von Geschirr und eine Düse (15, 16, 17) zum Sprühen von Spülwasser angeordnet sind;
eine Wanne (20), in der Spülwasser, das dem Spülraum zugeführt wird, gesammelt wird;
ein Filterbauteil (110, 130), das in der Wanne zum Filtern von Fremdstoffen, die in dem Spülwasser enthalten sind, angeordnet ist;
ein Rotationsbauteil (210), das eine Schneide (215) umfasst, die mit dem Filterbauteil drehend in Kontakt kommt;
ein Antriebsbauteil (250), das eine Antriebskraft für das Rotationsbauteil (210) bereitstellt; und
eine drehbare Welle (220), die mit dem Rotationsbauteil (210) trennbar gekoppelt ist, wobei die drehbare Welle (220) zum Übertragen der Antriebskraft des Antriebsbauteils (250) auf das Rotationsbauteil (210) vorgesehen ist;

dadurch gekennzeichnet, dass:

die drehbare Welle (220) einen Haken umfasst, der sich wahlweise in das Rotationsbauteil (210) einhakt; und

dass der Geschirrspüler ferner Folgendes umfasst:

ein Bauteil (213) zum Koppeln der Welle, das an dem Rotationsbauteil (210) angeordnet ist, wobei das Bauteil (213) zum Koppeln der Welle mit der drehbaren Welle (220) gekoppelt ist; und
eine Rippe (270) zum Einhaken, die in dem Bauteil (213) zum Koppeln der Welle angeordnet ist, wobei die Rippe (270) zum Einhaken bei dem Haken (225, 228) eingehakt ist.

2. Geschirrspüler nach Anspruch 1, wobei sich die drehbare Welle (220) von dem Antriebsbauteil (250) nach oben erstreckt und wobei das Rotationsbauteil (210) in die Außenseite der drehbaren Welle (220) eingesetzt ist.

3. Geschirrspüler nach Anspruch 1, wobei das Antriebsbauteil (250) ein bidirektionaler Motor ist, der in einer Richtung im Uhrzeigersinn und in einer Richtung im Gegenuhrzeigersinn gedreht werden kann, und
wobei sich dann, wenn das Antriebsbauteil (250) in der Richtung im Uhrzeigersinn oder in der Richtung im Gegenuhrzeigersinn gedreht wird, der Haken (225, 228) bei dem Rotationsbauteil (210) einhakt.

4. Geschirrspüler nach Anspruch 1, wobei das Antriebsbauteil (250) ein unidirektionaler Motor ist, der in einer Richtung im Uhrzeigersinn und in einer Richtung im Gegenuhrzeigersinn gedreht werden kann, und
wobei sich dann, wenn das Rotationsbauteil (250) in einer Richtung entgegen einer Drehrichtung des unidirektionalen Motors gedreht wird, das Rotationsbauteil (250) in den Haken (225, 228) einhakt.

5. Geschirrspüler nach Anspruch 1, wobei die Rippe zum Einhaken Folgendes umfasst:

ein Bauteil (272) zum Halten des Hakens, das an einer Innenumfangsfläche des Bauteils (213) zum Koppeln der Welle angeordnet ist, wobei das Bauteil (272) zum Halten des Hakens den Haken (225, 228) hält; und
ein Stoppelement (274), das in die drehbare Welle eingreift, wenn die drehbare Welle um einen vorgegebenen Winkel gedreht wird.

6. Geschirrspüler nach Anspruch 1, wobei die Rippe (270) zum Einhaken mehrfach vorgesehen ist, und wobei dann, wenn das Antriebsbauteil (250) in der Richtung im Uhrzeigersinn oder in der Richtung im Gegenuhrzeigersinn gedreht wird, eine Rippe (270) zum Einhaken der mehreren Rippen (270) zum Einhaken mit dem Haken (225, 228) gekoppelt ist.

7. Geschirrspüler nach Anspruch 6, wobei die mehreren Rippen (270) zum Einhaken in Richtungen angeordnet sind, die einander entgegengesetzt sind.

8. Geschirrspüler nach Anspruch 1, wobei die drehbare Welle (220) Folgendes umfasst:

ein Körperbauteil (221), das mit einer Motorwelle (252) des Antriebsbauteils (250) gekoppelt ist,
ein Hakenbauteil (223), das eine Querschnittsfläche aufweist, die kleiner als die des Körperbauteils (221) ist, wobei das Hakenbauteil (223) einen Haken (225, 228) umfasst; und
ein Haltebauteil (222), das eine Grenze zwischen dem Körperbauteil (221) und dem Hakenbauteil (223) definiert, wobei das Haltebauteil das Rotationsbauteil (210) hält.

9. Geschirrspüler nach Anspruch 8, wobei das Haltebauteil (222) den gleichen Durchmesser wie das Körperbauteil (221) aufweist und wobei das Hakenbauteil (223) eine Form aufweist, die von einer Au-

ßenumfangsfläche des Haltebauteils (222) nach innen eingeschnitten ist.

10. Geschirrspüler nach Anspruch 1, wobei das Hakenbauteil (223) ein ausgespartes Bauteil (224, 227) umfasst, das von einer Außenumfangsfläche ausgespart ist, und wobei der Haken (225, 228) an einem Ende einer Seite des ausgesparten Bauteils angeordnet ist.

11. Geschirrspüler nach Anspruch 10, wobei das ausgesparte Bauteil (224, 227) und der sich längs erstreckende Haken (225, 228) ein gebogenes Bauteil bilden.

12. Geschirrspüler nach Anspruch 1, wobei der Haken (225, 228) mehrfach vorgesehen ist.

13. Geschirrspüler nach Anspruch 1, wobei das Filterbauteil Folgendes umfasst:

einen ersten Filter (10); und
einen zweiten Filter (130), der den ersten Filter (110) aufnimmt, wobei der zweite Filter (130) Waschwasser, das durch den ersten Filter (110) gelangt ist, zusätzlich filtert.

14. Geschirrspüler nach Anspruch 13, wobei das Rotationsbauteil (210) in einem Zwischenraum zwischen dem ersten Filter (110) und dem zweiten Filter (130) angeordnet ist.

Revendications

1. Lave-vaisselle comprenant :

un espace de lavage dans lequel sont disposés une étagère pour recevoir de la vaisselle et une buse (15, 16, 17) pour pulvériser de l'eau de lavage ;
une bâche (20) dans laquelle l'eau de lavage alimentée dans l'espace de lavage est collectée ;
une partie formant filtre (110, 130) disposée dans la bâche pour filtrer les substances étrangères contenues dans l'eau de lavage ;
une partie rotative (210) comprenant une lame (215) qui est en contact en rotation avec la partie formant filtre ;
une partie d'entraînement (250) appliquant une force d'entraînement à la partie rotative (210) ; et
un arbre rotatif (220) couplé de manière séparable à la partie rotative (210), dans lequel l'arbre rotatif (220) est destiné à transmettre la force d'entraînement de la partie d'entraînement (250) à la partie rotative (210) ;

caractérisé en ce que
l'arbre rotatif (220) comprend un crochet accroché de façon sélective à la partie rotative (210) ; et le lave-vaisselle comprend en outre :

une partie de couplage d'arbre (213) disposée sur la partie rotative (210), la partie de couplage d'arbre (113) étant couplée à l'arbre rotatif (220) ; et une nervure à crochet (270) disposée à l'intérieur de la partie de couplage d'arbre (213), la nervure à crochet (270) étant accrochée au crochet (225, 228).

2. Lave-vaisselle selon la revendication 1, dans lequel l'arbre rotatif (220) s'étend vers le haut depuis la partie d'entraînement (250), et la partie rotative (210) est insérée dans l'extérieur de l'arbre rotatif (220).

3. Lave-vaisselle selon la revendication 1, dans lequel la partie d'entraînement (250) est un moteur bidirectionnel capable de tourner dans le sens des aiguilles d'une montre et dans le sens inverse aux aiguilles d'une montre, et
quand la partie d'entraînement (150) est mise en rotation dans le sens des aiguilles d'une montre ou dans le sens contraire aux aiguilles d'une montre, le crochet (225, 228) est accroché à la partie rotative (210).

4. Lave-vaisselle selon la revendication 1, dans lequel la partie d'entraînement (250) est un moteur unidirectionnel capable de rotation dans le sens des aiguilles d'une montre et dans le sens inverse aux aiguilles d'une montre, et
quand la partie rotative (250) est mise en rotation dans un sens opposé à un sens de rotation du moteur unidirectionnel, la partie rotative (250) et accrochée au crochet (225, 228).

5. Lave-vaisselle selon la revendication 1, dans lequel la nervure à crochet comprend :

une partie de support de crochet (272) disposée sur une surface circonférentielle intérieure de la partie de couplage d'arbre (213), la partie de support de crochet (272) supportant le crochet (225, 228) ; et
un arrêt (274) qui interfère avec l'arbre rotatif quand l'arbre rotatif est tourné à un angle préétabli.

6. Lave-vaisselle selon la revendication 1, dans lequel la nervure à crochet (270) est prévue en nombre pluriel, et lorsque la partie d'entraînement (250) est mise en rotation dans le sens des aiguilles d'une montre ou dans le sens inverse aux aiguilles d'une montre, une nervure à crochet (270) de la pluralité

de nervures crochet (270) est couplée au crochet (225, 228).

7. Lave-vaisselle selon la revendication 6, dans lequel la pluralité de nervures à crochet (170) sont disposées dans des directions qui se font mutuellement face.

8. Lave-vaisselle selon la revendication 1, dans lequel l'arbre rotatif (220) comprend :

une partie formant corps (221) couplée à un arbre moteur (252) de la partie d'entraînement (250),
une partie en crochet (223) ayant une aire de section inférieure à celle de la partie formant corps (221), la partie en crochet (223) comprenant un crochet (225 ; 228) ; et
une partie de support (222) définissant une frontière entre la partie formant corps (221) et la partie en crochet (223), la partie de support supportant la partie rotative (210).

9. Lave-vaisselle selon la revendication 8, dans lequel la partie de support (222) a le même diamètre que celui de la partie formant corps (221), et la partie en crochet (223) a une forme découpée vers l'intérieur depuis une surface circonférentielle extérieure de la partie de support (222).

10. Lave-vaisselle selon la revendication 1, dans lequel la partie en crochet (223) comprend une partie évidée (224, 227) évidée vers l'intérieur depuis une surface circonférentielle extérieure, et le crochet (225, 228) est disposé sur une extrémité d'un côté de la partie évidée.

11. Lave-vaisselle selon la revendication 10, dans lequel la partie évidée (224, 227) et le crochet en extension (225, 228) forment une partie recourbée.

12. Lave-vaisselle selon la revendication 1, dans lequel le crochet (225, 228) est prévu en nombre pluriel.

13. Lave-vaisselle selon la revendication 1, dans lequel la partie formant filtre comprend :

un premier filtre (110) ; et
un second filtre (130) recevant le premier filtre (110) à l'intérieur, le second filtre (130) filtrant additionnellement l'eau de lavage qui passe à travers le premier filtre (110).

14. Lave-vaisselle selon la revendication 13, dans lequel la partie rotative (210) est disposée dans un espace entre le premier filtre (110) et le second filtre (130).

Fig. 1

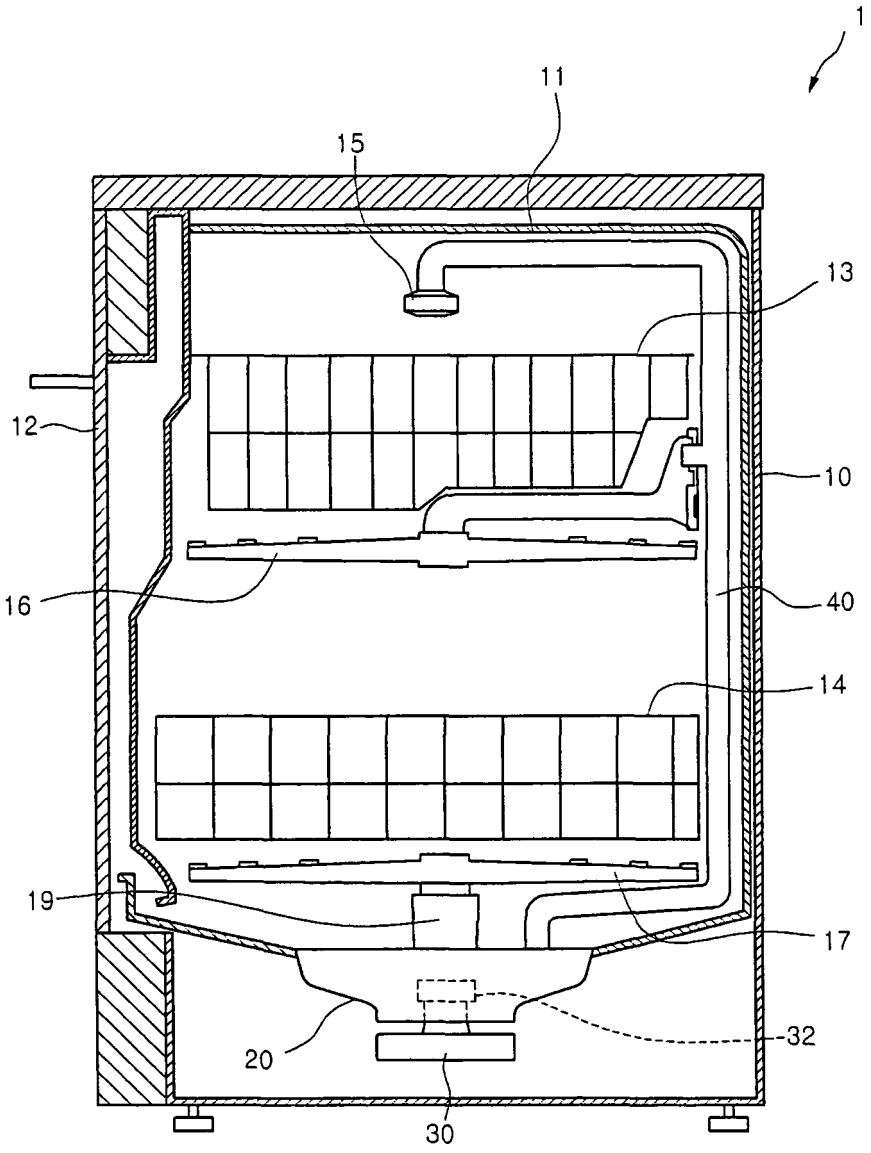


Fig. 2

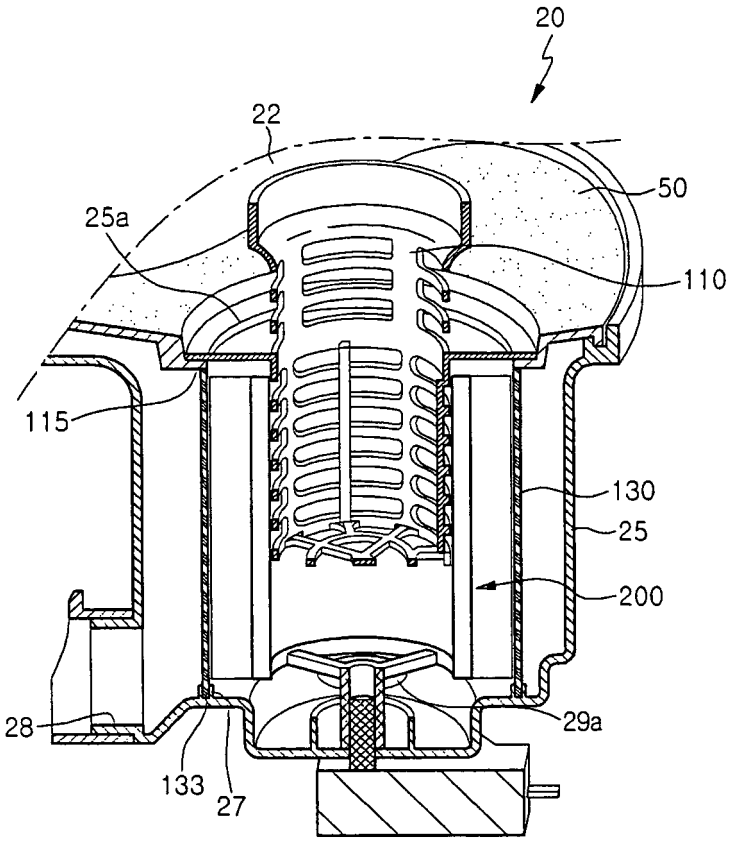


Fig. 3

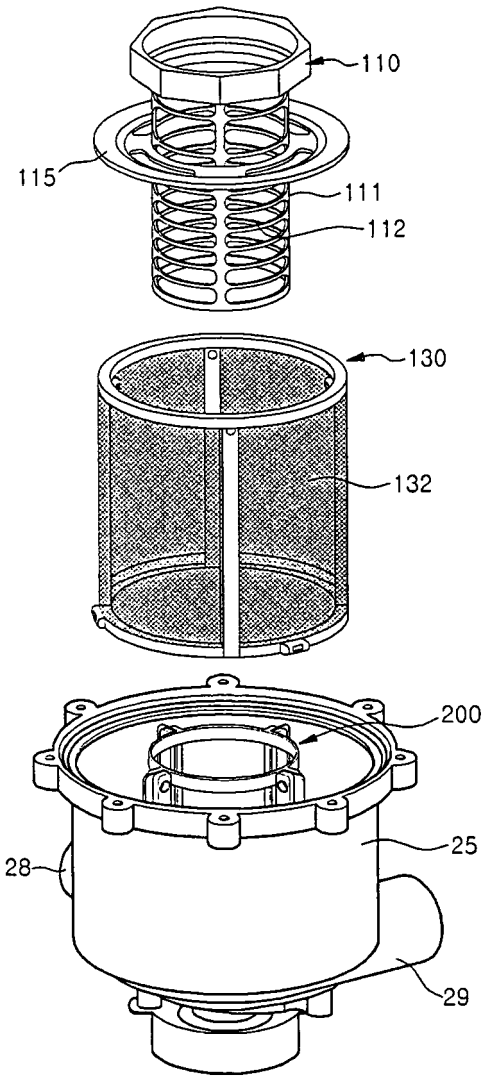


Fig. 4

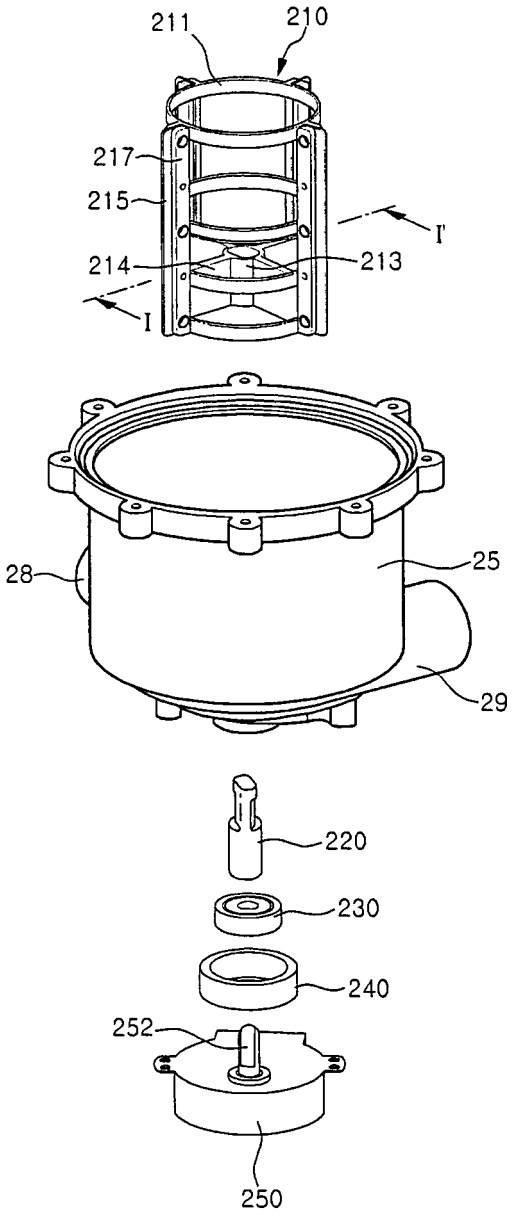


Fig. 5

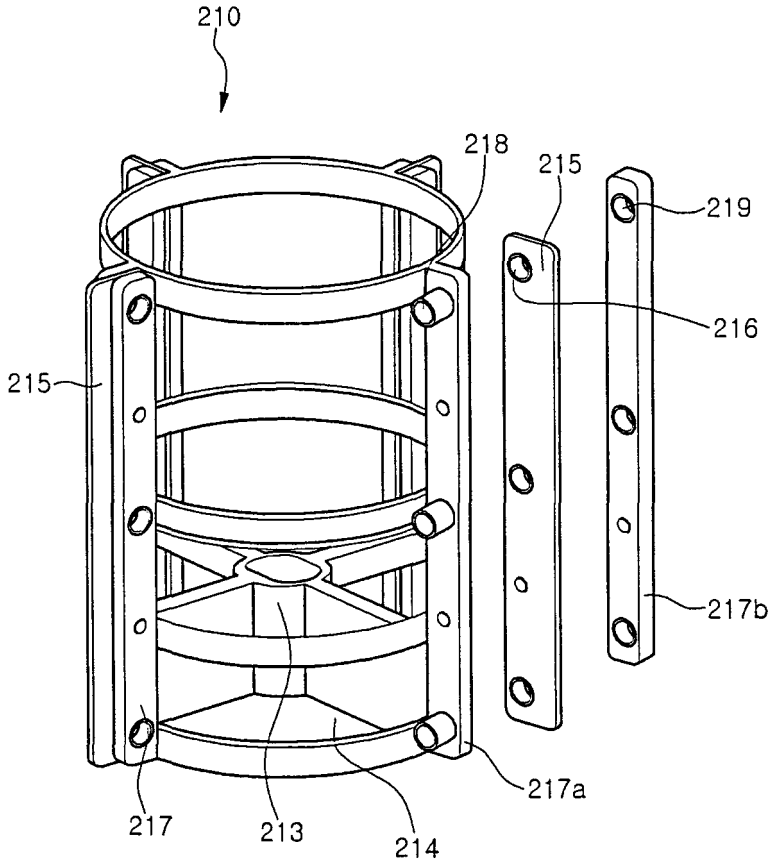


Fig. 6

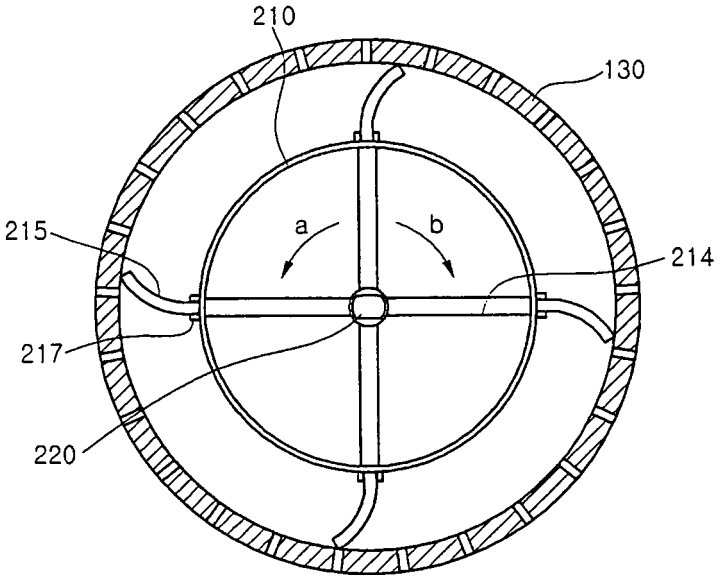


Fig. 7

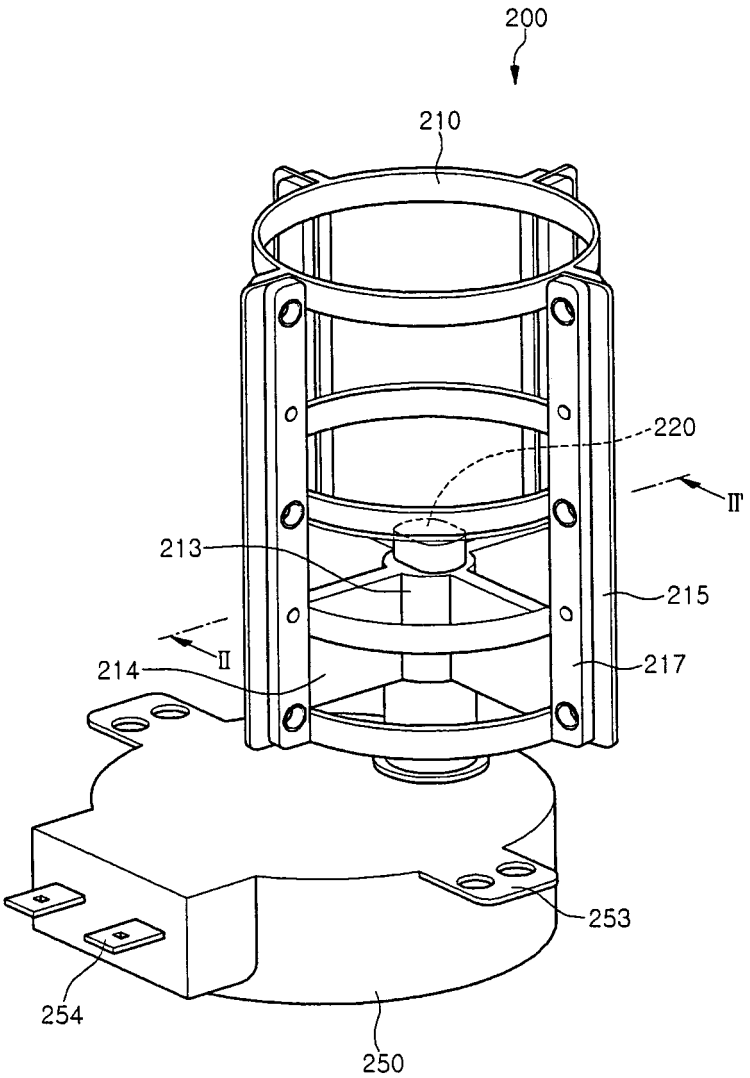


Fig. 8

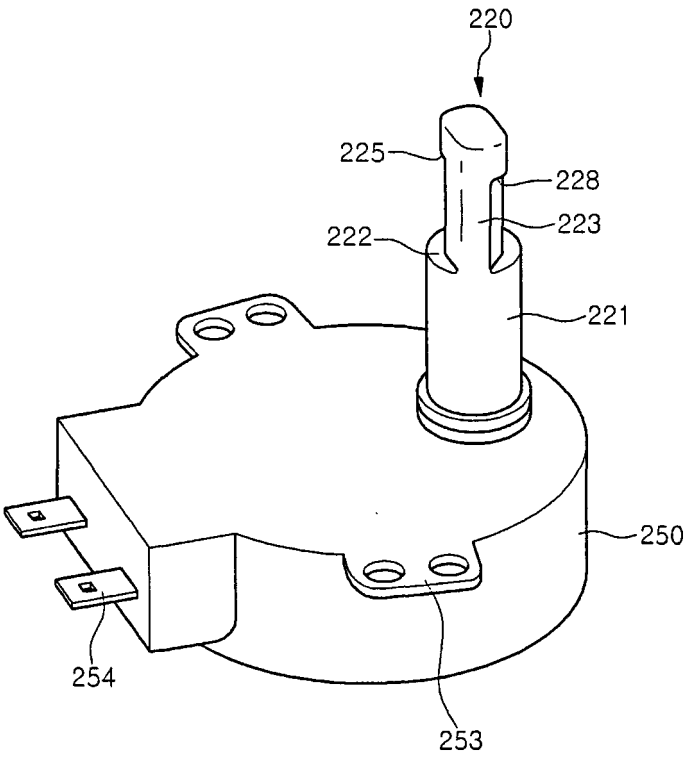


Fig. 9

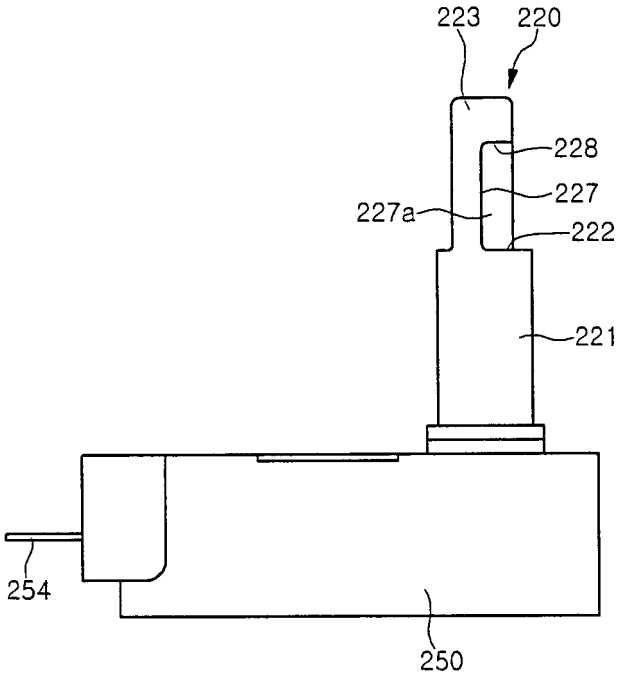


Fig. 10

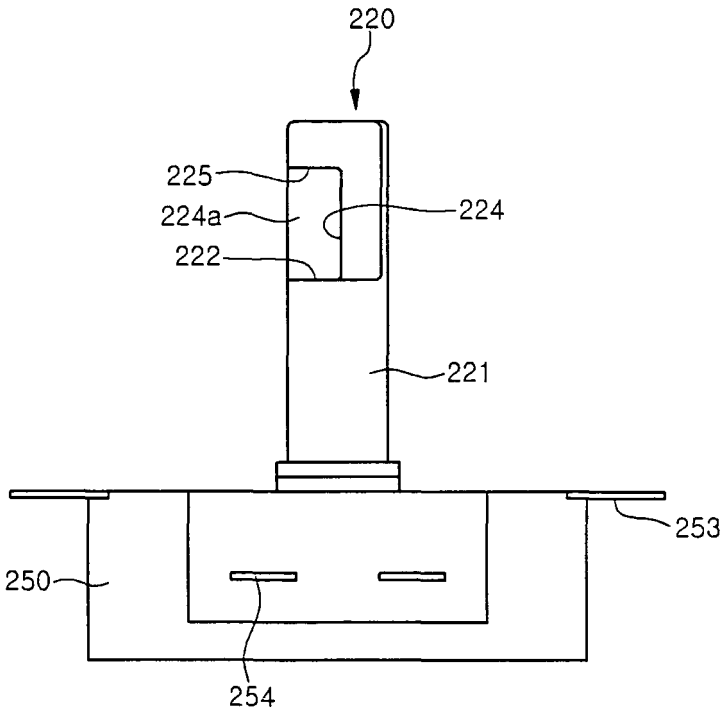


Fig. 11

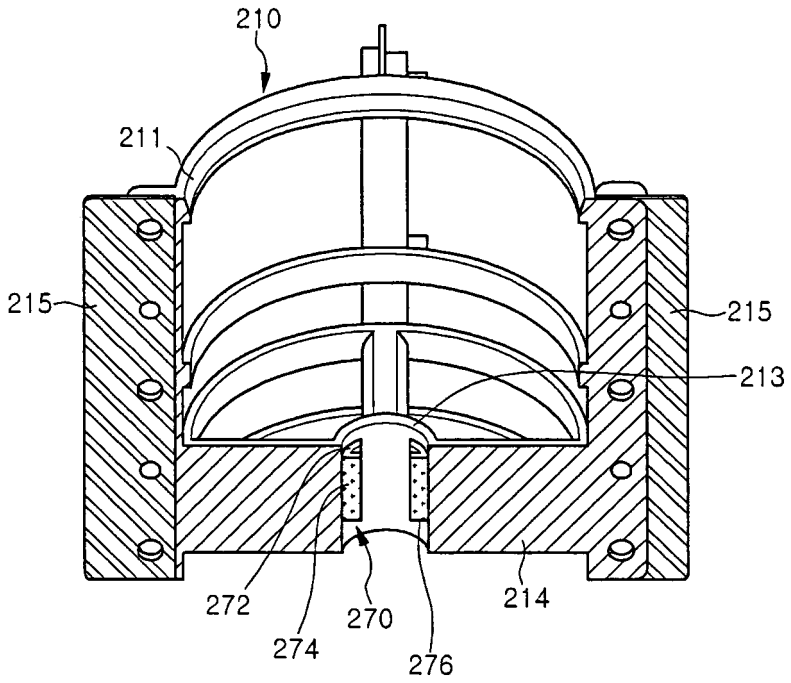


Fig. 12

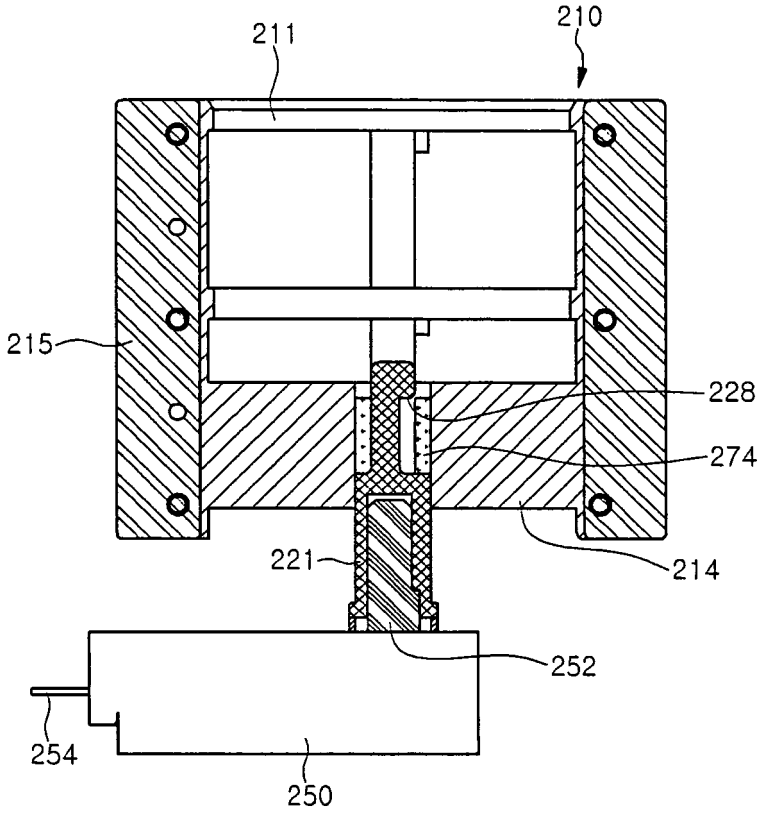


Fig. 13

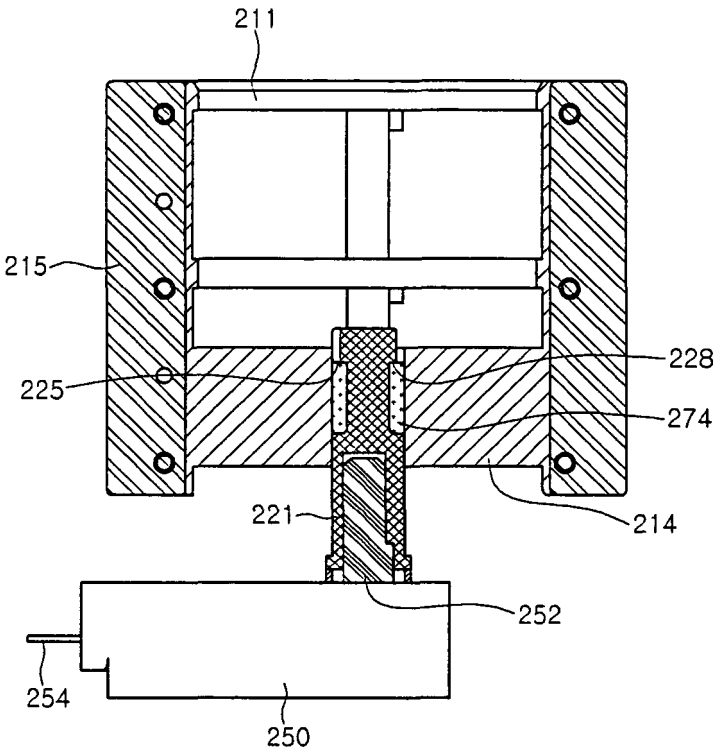
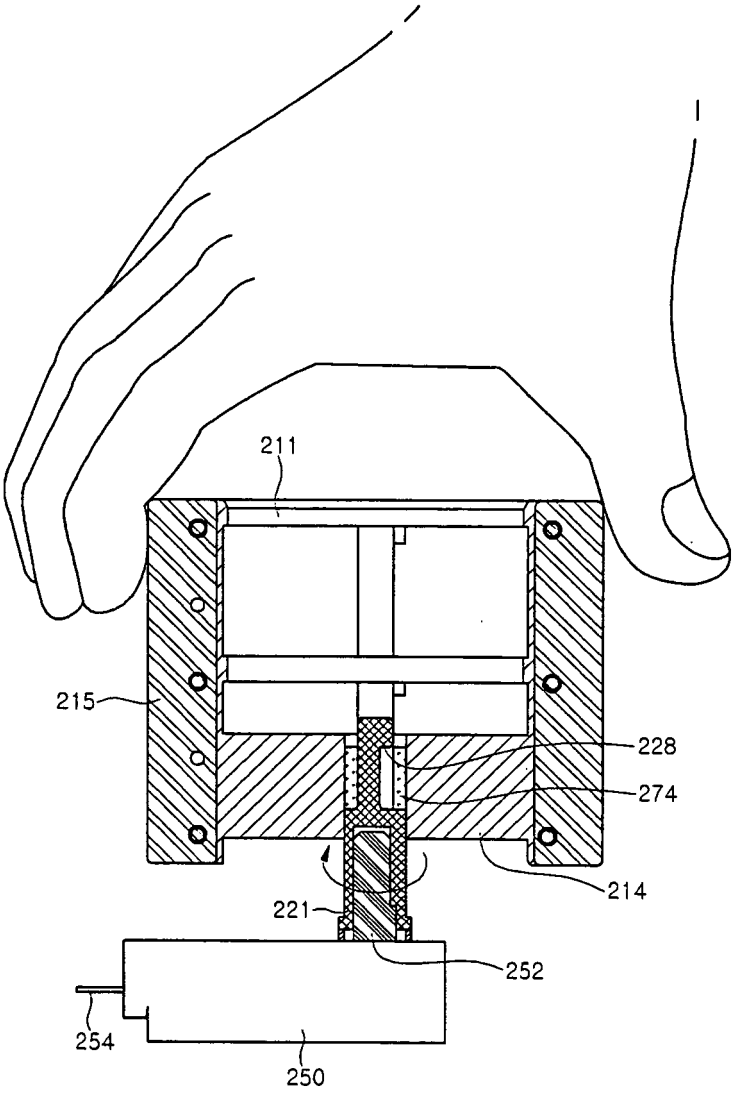


Fig. 14



REFERENCES CITED IN THE DESCRIPTION

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- EP 1057445 A2 **[0009]**