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(72) Inventors:
• **KO, Myungwon**
Seoul 08592 (KR)
• **KO, Minkyu**
Seoul 08592 (KR)

(74) Representative: **Schornack, Oliver**
Wuesthoff & Wuesthoff
Patentanwälte und Rechtsanwalt PartG mbB
Schweigerstraße 2
81541 München (DE)

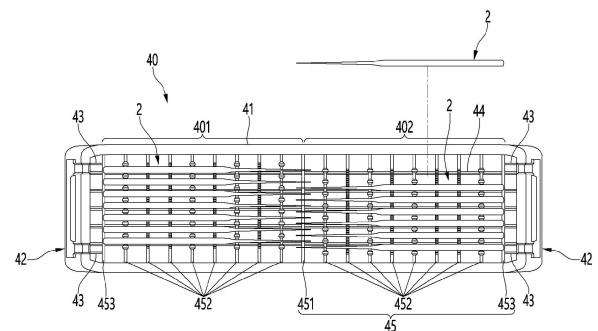
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(71) Applicant: **LG Electronics Inc.**
Yeongdeungpo-gu
Seoul 07336 (KR)

(54) **DISHWASHER**

(57) The present invention relates to a dishwasher, including a body forming a washing space having an open front surface; a door opening and closing the washing space; a rack provided to be withdrawn and inserted in front and rear directions in the washing space and in which dishes for washing are accommodated; and an accessory seated on the rack and on which silverware for washing is placed, wherein the accessory includes a frame forming a periphery of an accommodating part on which the silverware is seated; a first loading part formed at one side of the accommodating part and including a plurality of alignment grooves allowing the silverware to be loaded; and a second loading part formed at the other side of the accommodating part and including a plurality of alignment grooves allowing the silverware to be loaded, wherein the first loading part and the second loading part are disposed at positions facing each other with respect to a center of the accommodating part, and wherein an extension line of the alignment groove of the first loading part and an extension line of the alignment groove of the second loading part are arranged in parallel while being spaced apart from each other.

[Fig. 4]



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Description**TECHNICAL FIELD**

[0001] The present disclosure relates to a dishwasher.

BACKGROUND ART

[0002] A dishwasher is one of kitchen appliances that washes dishes by spraying high-pressure washing water through washing nozzles in order to remove food residues or contaminants remaining on the dishes.

[0003] In general, the dishwasher has a configuration including a dishwasher body providing a space in which dishes are washed, a sump provided below the body and in which washing water is stored and from which the washing water is supplied to the washing space, and washing nozzles provided inside the body and configured to spray high-pressure washing water into the washing space.

[0004] In addition, a rack in which dishes to be washed are accommodated may be provided inside the tub. The rack is generally formed in a structure such as a drawer or a mesh so as to facilitate accommodation of dishes, and may be formed of a wire material such that the accommodated dishes are washed by washing water sprayed in upward and downward directions.

[0005] The rack may be configured like a drawer for user convenience and may have a structure that is withdrawn and inserted. In addition, a plurality of the racks may be vertically arranged, and dishes having appropriate sizes may be accommodated in the respective racks. Further, an accessory such as a dedicated rack for accommodating silverware such as spoons, forks, and knives may additionally be provided on the rack as needed.

[0006] However, in an accessory of a conventional dishwasher, when a plurality of pieces of silverware are disposed, the pieces of silverware overlap each other, thereby causing a problem in that washing performance is degraded.

[0007] In addition, when the plurality of pieces of silverware are intended to be independently disposed in the accessory without overlapping each other, there is a problem in that the number of pieces of silverware accommodated in the accessory is reduced or an overall volume of the accessory is increased.

[0008] In addition, when a plurality of pieces of silverware having different lengths are accommodated, the plurality of pieces of silverware are not aligned and overlap each other, thereby causing a problem in that washing and drying performance is degraded.

DISCLOSURE**TECHNICAL PROBLEM**

[0009] An embodiment of the present invention is directed to providing a dishwasher that induces a plurality of pieces of silverware disposed on an accessory to be aligned in one direction, thereby ensuring washing and drying performance.

[0010] An embodiment of the present invention is directed to providing a dishwasher capable of disposing a larger number of pieces of silverware without overlapping each other, without increasing a size of an accessory.

[0011] An embodiment of the present invention is directed to providing a dishwasher having an accessory capable of efficiently loading pieces of silverware having various lengths.

TECHNICAL SOLUTION

[0012] A dishwasher according to an embodiment of the present invention may include a body forming a washing space having an open front surface; a door opening and closing the washing space; a rack provided to be withdrawn and inserted in front and rear directions in the washing space and in which dishes for washing are accommodated; and an accessory seated on the rack and on which silverware for washing is placed, wherein the accessory may include a frame forming a periphery of an accommodating part on which the silverware is seated; a first loading part formed at one side of the accommodating part and including a plurality of alignment grooves allowing the silverware to be loaded; and a second loading part formed at the other side of the accommodating part and including a plurality of alignment grooves allowing the silverware to be loaded, wherein the first loading part and the second loading part may be disposed at positions facing each other with respect to a center of the accommodating part, and an extension line of the alignment groove of the first loading part and an extension line of the alignment groove of the second loading part may be arranged in parallel while being spaced apart from each other.

[0013] The accommodating part may include a plurality of longitudinal ribs extending along a length direction of the frame and spaced apart from each other, and a plurality of transverse ribs crossing the longitudinal ribs and spaced apart from each other, and the alignment grooves may be continuously arranged along the transverse ribs.

[0014] The alignment grooves may be formed in transverse ribs other than a transverse rib disposed at a center of the accommodating part among the plurality of transverse ribs.

[0015] The alignment grooves formed in the plurality of transverse ribs constituting the first loading part may be disposed on the same extension line, the alignment grooves formed in the plurality of transverse ribs con-

stituting the second loading part may be disposed on the same extension line, and the extension line of the first loading part and the extension line of the second loading part may be different extension lines.

[0016] The plurality of alignment grooves disposed in the same transverse rib among the plurality of transverse ribs may all be formed in the same shape.

[0017] The plurality of alignment grooves disposed in different transverse ribs formed on the same extension line may be formed in different shapes.

[0018] A partition protrusion protruding upward from both sides of the alignment groove and partitioning between pieces of silverware disposed in the alignment groove may be formed on the transverse rib.

[0019] The partition protrusions formed on the plurality of transverse ribs constituting the first loading part may be disposed on the same extension line, the partition protrusions formed on the plurality of transverse ribs constituting the second loading part may be disposed on the same extension line, and the extension line of the first loading part and the extension line of the second loading part may be different extension lines.

[0020] The partition protrusions disposed on the same transverse rib may have the same height, and the partition protrusions disposed on the same extension line may be formed to have different heights.

[0021] The alignment groove may include a first inclined surface and a second inclined surface having different inclinations, and the alignment groove may be formed such that the same shape is continuously formed.

[0022] A point at which lower ends of the first inclined surface and the second inclined surface meet may be formed to be eccentric with respect to a center of the alignment groove.

[0023] The alignment groove may include a first alignment groove continuously formed in plurality along at least one transverse rib among the plurality of transverse ribs, and first partition protrusions protruding upward and partitioning between pieces of silverware disposed in the first alignment groove may be formed at both sides of the first alignment groove.

[0024] The alignment groove may include a second alignment groove continuously formed in plurality along another transverse rib other than the transverse rib in which the first alignment groove is formed among the plurality of transverse ribs, second partition protrusions protruding upward and partitioning between pieces of silverware disposed in the second alignment groove may be formed at both sides of the second alignment groove, and the first partition protrusions and the second partition protrusions may have different heights.

[0025] The alignment groove may include a third alignment groove continuously formed in plurality along another transverse rib other than the transverse rib in which the first alignment groove is formed and the transverse rib in which the second alignment groove is formed among the plurality of transverse ribs, and the

third alignment groove may be formed smaller than sizes of the first alignment groove and the second alignment groove.

[0026] Inclinations of inclined surfaces of the first alignment groove and the second alignment groove may be formed differently from each other.

ADVANTAGEOUS EFFECTS

[0027] The following effects can be expected in the dishwasher according to the proposed embodiment.

[0028] In the dishwasher according to an embodiment of the present invention, a plurality of alignment grooves and partition protrusions are formed in the accommodating part of the accessory, and a plurality of pieces of silverware disposed in the respective alignment grooves may be aligned in a state inclined in one direction by an asymmetric shape of the alignment grooves. Accordingly, the pieces of silverware are aligned in one direction without overlapping each other, thereby providing an advantage in that washing and drying efficiency can be improved.

[0029] In addition, the accommodating part includes a first loading part and a second loading part formed at both sides with respect to a center thereof, and extension lines of the alignment grooves formed in the respective loading parts may be arranged in parallel while being spaced apart from each other. Accordingly, the pieces of silverware disposed in the first loading part and the second loading part may be disposed so as to cross each other without overlapping each other, thereby providing an advantage in that accommodating efficiency of the accommodating part can be improved.

[0030] That is, by allowing aligned pieces of silverware to be disposed at both sides without overlapping each other, there is an advantage in that a larger number of pieces of silverware for washing can be disposed in an accessory occupying the same volume. In addition, there is also an advantage in that washing and drying performance can be ensured by maintaining an aligned state while disposing a large number of pieces of silverware.

[0031] In addition, a plurality of transverse ribs are formed in the accommodating part, and alignment parts are formed on the plurality of transverse ribs, thereby providing an advantage in that pieces of silverware having various lengths can be efficiently loaded. Further, different alignment grooves are formed on adjacent transverse ribs, thereby providing an advantage in that effective arrangement and alignment are possible even when accessories having different sizes are seated.

DESCRIPTION OF DRAWINGS

[0032]

FIG. 1 is a perspective view illustrating a state in

which a door of a dishwasher according to a first embodiment of the present invention is opened.

FIG. 2 is a perspective view illustrating an accessory mounted on a rack according to the first embodiment of the present invention.

FIG. 3 is a perspective view of the accessory.

FIG. 4 is a plan view illustrating silverware disposed on the accessory.

FIG. 5 is a view illustrating an arrangement of a first loading part and a second loading part of the accessory.

FIG. 6 is a partial perspective view illustrating an arrangement of alignment parts formed in the first loading part and the second loading part.

FIG. 7 is a view illustrating an enlarged view of portion A of FIG. 6 and shapes of the alignment parts.

FIG. 8 is a view illustrating a shape of an alignment part according to a second embodiment of the present invention.

FIG. 9 is a view illustrating a shape of an alignment part according to a third embodiment of the present invention.

FIG. 10 is a view illustrating a shape of an alignment part according to a fourth embodiment of the present invention.

MODE FOR INVENTION

[0033] Hereinafter, specific embodiments of the present invention will be described in detail with reference to the accompanying drawings. However, the present invention is not limited to the embodiments in which the spirit of the present invention is presented, and other embodiments included within the scope of the spirit of the present invention or other regressive inventions may be readily proposed through addition, modification, deletion, or the like of other constituent elements.

[0034] Prior to the description, directions will be defined. In an embodiment of the present invention, with reference to a center of a washing space of the dishwasher illustrated in FIG. 1, a direction toward the door may be defined as a front direction, a direction toward the body with reference to a front surface of the door may be defined as a rear direction, a direction toward an upper surface with reference to a center of the body may be defined as an upward direction, and a direction toward a lower surface with reference to the center of the body may be defined as a downward direction.

[0035] FIG. 1 is a perspective view illustrating a state in which a door of a dishwasher according to an embodiment of the present invention is opened.

[0036] As illustrated in the drawings, an exterior of a dishwasher 1 according to an embodiment of the present invention may be formed by a body 10 and a door 20. The body 10 may include a tub 11 in which a washing space for washing dishes is formed. In addition, the

body 10 may form the exterior of the dishwasher 1 and may have different configurations depending on an installation state, such as a freestanding type or a built-in type.

5 [0037] The door 20 may open and close the tub 11 having an open front surface. A lower end of the door 20 may be rotatably coupled to a front surface of the body 10 to open and close the tub 11.

10 [0038] The tub 11 may form a washing space 110 in which dishes are washed and may be formed in a box shape having an open front surface, and may occupy most of an interior region of the body 10.

[0039] The tub 11 may be formed of a stainless material, and racks 31 and 32 in which dishes are accommodated may be disposed therein so as to be withdrawn and inserted. The racks 31 and 32 may be formed in a basket shape in which a plurality of wires cross each other so as to facilitate washing of accommodated dishes. The racks 31 and 32 may be formed in various shapes, and a plurality thereof may be vertically arranged. For example, the racks 31 and 32 may include a lower rack 31 and an upper rack 32.

[0040] Rails 12 may be provided on left and right side surfaces of the tub 11, and the rails 12 may be connected to the upper rack 32 or the lower rack 31 such that the upper rack 32 and the lower rack 31 are withdrawn and inserted. For example, the upper rack 32 may be withdrawn and inserted along the rails 12, and the lower rack 31 may be withdrawn and inserted along a rear surface of the door 20.

[0041] A plurality of nozzles 14 and 15 for spraying water for washing dishes may be disposed inside the tub 11. For example, the nozzles 14 and 15 may be disposed at an upper surface and a lower surface of the tub 11 and between the racks 31 and 32 vertically arranged. Accordingly, dishes accommodated in the racks 31 and 32 may be washed by washing water sprayed upward and downward from the plurality of nozzles 14 and 15.

40 [0042] A sump 13 may be provided at a bottom of the tub 11. The sump 13 may be disposed in a lower portion of the body 10, that is, in a space below the tub 11, and an opening of the sump 13 may be positioned at the bottom of the tub 11 such that water falling from the tub 11 flows thereinto.

45 [0043] In addition, a circulation pump for circulating washing water may be provided in the sump 13. The circulation pump may suction water in the sump 13 and discharge the water toward the nozzles 14 and 15. Accordingly, water in the sump 13 may be continuously supplied to the nozzles 14 and 15 by operation of the circulation pump, thereby enabling circulation and spraying of the washing water. In addition, a drain portion through which water in the sump 13 is drained may be provided at another side of the sump 13. Accordingly, the washing water may be drained through the drain portion during a washing operation or after completion of the operation. To this end, a flow path for flow

of the washing water may be formed between the sump 13, the circulation pump, the nozzles 14 and 15, and the drain portion. In addition, a heat pump or a heater may be provided in the body 10 to heat the washing water and the tub.

[0044] Hereinafter, structures of the rack 32 and the accessory 40 will be described in detail with reference to the drawings. The accessory 40 may be mounted on both the upper rack 32 and the lower rack 31. However, for convenience of description, a case in which the accessory 40 is mounted on the upper rack 32 will be described as an example. In the following description, the upper rack 32 may be referred to simply as the rack 32.

[0045] FIG. 2 is a perspective view illustrating an accessory mounted on a rack according to an embodiment of the present invention.

[0046] As illustrated, the rack 32 may have a basket structure having a mesh shape formed by a plurality of wires. For example, the wires may be formed of a metal material and may be formed of a stainless-steel material.

[0047] The wires may include a main wire 321 forming a periphery of an upper end of the rack 32. In addition, a plurality of transverse wires 322 and longitudinal wires 323 may be provided so as to cross between the main wires 321. The transverse wires 322 and the longitudinal wires 323 may be continuously arranged in plurality and spaced apart from each other to form a lattice-shaped mesh structure. In addition, both ends of the transverse wires 322 and the longitudinal wires 323 may be bent upward and connected to the main wire 321, thereby forming a basket-like shape. Further, the transverse wires 322 and the longitudinal wires 323 may be bent into various shapes suitable for types and shapes of dishes accommodated in the rack 32. The wires may also be in the form of thick rods or bars.

[0048] In addition, guide members 33 may be formed on left and right sides of the rack 32. The guide members 33 may be molded of a plastic material and coupled to the main wire 321, and may be exposed on outer side surfaces of the left and right sides of the rack 32.

[0049] The guide members 33 may be coupled to the rails 12 such that the rack 32 moves in front and rear directions. To this end, the guide members 33 may be provided with a plurality of rollers. In addition, the guide members 33 may move upward and downward while being coupled to the rack 32 and may adjust a distance from the lower rack 31 or a space above the rack 32.

[0050] Cup seating members 35 may be provided on left and right sides of the rack 32. The cup seating members 35 may be rotatably mounted on the left and right sides of the rack 32. The cup seating members 35 may be unfolded from side surfaces of the rack 32 by rotation and may provide a space on which dishes 3 such as cups are seated.

[0051] A front cover 34 may be provided at a front

end of the rack 32. The front cover 34 may be formed along the main wire 321 forming the front end of the rack 32. In addition, both ends of the front cover 34 may extend rearward and be connected to the guide members 33.

[0052] The front cover 34 may be formed of a plastic material and may be formed to surround the main wire 321. Accordingly, an upper front portion of the rack 32 on which the front cover 34 is formed becomes thicker than the main wire 321 and may be used as a handle when a user withdraws and inserts the rack 32.

[0053] In addition, a middle nozzle 15 that is withdrawn and inserted together with the rack 32 may be provided below the rack 32, and water sprayed upward from the middle nozzle 15 may pass through the rack 32 and wash dishes accommodated in the rack 32.

[0054] Meanwhile, an accessory 40 may be seated on the rack 32. The accessory 40 may accommodate pieces of silverware 2 such as spoons, forks, and knives, may be seated on an upper portion of the rack 32, and may be moved in left and right directions to be mounted at a desired position. For example, the accessory 40 may have a structure suitable for accommodating knives. Accordingly, the accessory 40 may be referred to as a knife rack.

[0055] In addition, the accessory 40 may be mounted on the main wire 321. Front and rear ends of the accessory 40 may be seated on the main wire 321 forming an upper front portion and an upper rear portion of the rack 32. To this end, a length of the accessory 40 in the front and rear directions may be equal to or slightly greater than a length of the rack 32 in the front and rear directions.

[0056] An accommodating part 410 on which small dishes 2 such as silverware including spoons, forks, and knives may be disposed may be formed on an upper surface of the accessory 40. The accommodating part 410 may form a recessed space and may provide a space in which the dishes 2 are disposed. For example, the accommodating part 410 may be opened in a lattice shape such that water sprayed from below may pass therethrough.

[0057] Front and rear ends of the accessory 40 may extend in an upward and downward direction such that the accommodating part 410 is sufficiently spaced apart from an upper end of the rack 32. Accordingly, when mounted, the accessory 40 may secure a space in which dishes may be disposed on the rack 32 and may have a structure and shape capable of minimizing interference with dishes disposed on the rack 32.

[0058] For example, the accessory 40 may be injection-molded from a plastic material in order to implement a three-dimensional shape.

[0059] Hereinafter, the structure of the accessory 40 will be described in more detail with reference to the drawings.

[0060] FIG. 3 is a perspective view of the accessory. FIG. 4 is a plan view illustrating silverware disposed on

the accessory.

[0061] As illustrated, the accessory 40 may include a frame 41 in which an accommodating part 410 is formed, and supporters 42 extending downward from front and rear ends of the frame 41.

[0062] The frame 41 may form an upper portion of the accessory 40 and may form a space in which dishes such as the silverware 2 are disposed. The frame 41 may form a periphery of the accommodating part 410. In addition, the frame 41 may protrude upward beyond the accommodating part 410. The frame 41 may be formed in a rectangular frame shape when viewed from above. For example, the frame 41 may include a pair of first side portions 411 forming left and right outer appearances and extending in front and rear directions, and a pair of second side portions 412 forming front and rear outer appearances and connecting front and rear ends of the pair of first side portions 411. The first side portions 411 may be referred to as side portions, and the second side portions 412 may be referred to as a front portion and a rear portion.

[0063] A length of the accessory 40 may be determined by the first side portions 411 and may correspond to a length of the rack 32 in the front and rear directions. In addition, a width of the accessory 40 may be determined by the second side portions 412 and may be smaller than the length of the accessory 40. For example, the width of the accessory 40 may be smaller than half of a length of the rack 32 in left and right directions. Accordingly, the accessory 40 may be prevented from being interfered with by dishes disposed on the rack 32 regardless of a position of the accessory 40 in the left and right directions of the rack 32.

[0064] Meanwhile, the frame 41 may further include corner portions 413. The corner portions 413 may connect between ends of the first side portions 411 and ends of the second side portions 412 and may be formed in an inclined or rounded shape.

[0065] By the shape of the corner portions 413, catching or interference between the accessory 40 and another component may be prevented. For example, when the corner portions 413 of the accessory 40 come into contact with the body or another component during withdrawal and insertion of the rack 32, the shape of the corner portions 413 may allow the accessory 40 to move and be naturally repositioned.

[0066] Meanwhile, the supporters 42 may form front and rear surfaces of the accessory 40. In addition, the supporters 42 may be mounted on the rack 32. The supporters 42 may extend downward from front and rear ends of the frame 41. In this case, the pair of supporters 42 may be formed in the same shape. That is, the accessory 40 may be formed symmetrically with respect to a center in the front and rear directions.

[0067] The supporters 42 may extend downward from the second side portions 412. The supporters 42 may be integrally formed with the second side portions

412. That is, upper ends of the supporters 42 may form the second side portions 412, and in this case, the supporters 42 may constitute a part of the frame 41.

[0068] In addition, the supporters 42 may extend in an upward and downward direction such that the accommodating part 410 is positioned above the rack 32 by a predetermined distance. Further, lower ends of the supporters 42 may be seated on an upper end of the rack 32. For example, the front supporter 42 may be seated on the front cover 34, and the rear supporter 42 may be seated on the main wire 321.

[0069] For example, the supporter 42 may include an outer supporter 421 and an inner supporter 43. The outer supporter 421 may form front and rear surfaces of the supporter 42 and the accessory 40. The outer supporter 421 may include extension portions 422 extending downward from left and right sides of a front end of the frame 41.

[0070] The outer supporter 421 may further include a seating part 423. The seating part 423 may provide a surface seated on the upper end of the rack 32 and may connect between lower ends of the extension portions 422 on both sides. In addition, the seating part 423 may form a lower end of the outer supporter 421.

[0071] In addition, the opening 420 may be formed in the outer supporter 421. A lower end of the opening 420 may be formed by the seating part 423. Accordingly, through the opening 420, a support state between the supporter 42 and the rack 32, that is, an accurate mounting state of the accessory 40, may be checked.

[0072] The supporter 42 may further include the inner supporter 43. A pair of the inner supporters 43 may be provided at left and right sides of the supporter 42, and may extend in an upward and downward direction at positions closer to a center of the frame 41 than the outer supporter 421.

[0073] The inner supporter 43 may form a lower end of the supporter 42 together with the seating part 423. When the accessory 40 is separated from the rack 32 and independently placed, the inner supporter 43 may contact a ground together with the lower end of the outer supporter 421. Accordingly, the inner supporter 43 may also be referred to as a leg.

[0074] In addition, a seating groove 435 may be formed at a lower end of the inner supporter 43 such that the upper end of the rack 32 is inserted and seated therein. When the accessory 40 is mounted, the upper end of the rack 32 may be received in the seating groove 435, and stable mounting and fixation of the accessory 40 may be ensured.

[0075] Meanwhile, the accommodating part 410 in which the silverware 2 is accommodated may be formed in an inner region of the frame 41. The accommodating part 410 may include a plurality of longitudinal ribs 44 and transverse ribs 45. The longitudinal ribs 44 and the transverse ribs 45 may be arranged to cross each other such that a bottom of the accommodating part 410 is formed in a lattice shape. In addition, a

plurality of openings formed by intersections of the longitudinal ribs 44 and the transverse ribs 45 may facilitate passage and drainage of the washing water.

[0076] In this case, the longitudinal ribs 44 may be disposed parallel to the first side portions 411, and a plurality thereof may be formed at predetermined intervals in left and right directions. In addition, both ends of the longitudinal ribs 44 may be connected to the second side portions 412.

[0077] The transverse ribs 45 may be disposed parallel to the second side portions 412 and may be formed at predetermined intervals in front and rear directions. In addition, the transverse ribs 45 may extend so as to cross the longitudinal ribs 44. Accordingly, an overall lattice shape of the accommodating part 410 may be formed by the transverse ribs 45 and the longitudinal ribs 44. Further, both ends of the transverse ribs 45 may be connected to the first side portions 411.

[0078] Both ends of the longitudinal ribs 44 and the transverse ribs 45 may be bent upward. Accordingly, the accommodating part 410 may be positioned below the frame 41. That is, the frame 41 may serve as a rim protruding upward along a periphery of the accommodating part 410 so that the dishes 2 disposed in the accommodating part 410 do not fall out and maintain a stable seated state.

[0079] Meanwhile, the accommodating part 410 may generally include a first loading part 401 positioned in front of a central transverse rib 451 and a second loading part 402 positioned behind the central transverse rib 451. The first loading part 401 and the second loading part 402 may be configured such that the silverware 2 is separately arranged within the single accessory 40.

[0080] For example, the first loading part 401 and the second loading part 402 may be disposed at positions facing each other with respect to a center of the accommodating part 410. In addition, the first loading part 401 and the second loading part 402 may each include a plurality of alignment parts 49 allowing the silverware 2 to be accommodated in an aligned state. In detail, among all of the transverse ribs 45, the alignment parts 49 are not formed on the transverse rib 451 formed at the center of the accommodating part 410 and the transverse ribs 453 at front and rear ends, and the alignment parts 49 may be formed on the remaining transverse ribs 492.

[0081] The alignment part 49 may include a plurality of alignment grooves 490 continuously formed along the transverse rib 452. Accordingly, one piece of silverware 2 may be disposed in each alignment groove 490, and a plurality of pieces of silverware 2 may be mounted in a separated state without overlapping. In addition, the alignment grooves 490 may be formed to have directionality such that pieces of silverware 2 mounted in the plurality of alignment grooves 490 are all aligned and mounted in a state inclined in the same direction.

[0082] For example, the alignment parts 49 may be

formed on a plurality of transverse ribs 452 and may be formed in the first loading part 401 and the second loading part 402, respectively. In addition, the alignment parts 49 formed on the respective transverse ribs 452 may be formed in different shapes.

[0083] In addition, the alignment grooves 464a, 474a, and 483a formed in the first loading part 401 may be arranged in a plurality of rows, and each row may be disposed on the same extension line Lva. Accordingly, the pieces of silverware 2 may be independently seated in the plurality of alignment grooves 464a, 474a, and 483a positioned on the same extension line Lva, and may not overlap neighboring silverware 2.

[0084] In addition, the alignment grooves 464b, 474b, and 483b formed in the second loading part 402 may also be arranged in a plurality of rows, and each row may be disposed on the same extension line Lvb. Accordingly, the pieces of silverware 2 seated in the second loading part 402 may also be independently seated in the plurality of alignment grooves 464b, 474b, and 483b positioned on the same extension line Lvb, and may not overlap neighboring silverware 2.

[0085] Meanwhile, the alignment grooves 464b, 474b, and 483b formed in the second loading part 402 may not be disposed on the same extension line as the alignment grooves 464a, 474a, and 483a of the first loading part 401, and may be disposed on extension lines Lva and Lvb parallel to each other.

[0086] Accordingly, the pieces of silverware 2 seated in the first loading part 401 and the second loading part 402 may be independently seated in the plurality of alignment grooves 490 positioned on the same extension lines Lva and Lvb, respectively, and may not overlap neighboring silverware 2. In addition, the pieces of silverware 2 seated in the first loading part 401 may be arranged in parallel without overlapping the pieces of silverware 2 seated in the second loading part 402.

[0087] For example, as illustrated in FIG. 4, the silverware 2 may be a knife and may be disposed in each of the first loading part 401 and the second loading part 402. In this case, the knife may be disposed such that a handle portion faces a front end and a rear end of the accommodating part 410, and a blade portion faces a center of the accommodating part. In this case, the blade may be seated in the alignment grooves 464a, 474a, and 483a of the first loading part 401 and the alignment grooves 464b, 474b, and 483b of the second loading part, which are disposed in parallel to each other, respectively, and thus may be alternately disposed without overlapping each other.

[0088] Hereinafter, structures of the alignment parts 49 constituting the loading parts 401 and 402 will be described in more detail with reference to the drawings.

[0089] FIG. 5 is a view illustrating an arrangement of the first loading part and the second loading part of the accessory. In addition, FIG. 6 is a partial perspective view illustrating an arrangement of the alignment parts formed in the first loading part and the second loading

part. In addition, FIG. 7 is a view illustrating an enlarged view of portion A of FIG. 6 and shapes of the alignment parts.

[0090] As illustrated, a plurality of alignment parts 49 may be formed in the first loading part 401 and the second loading part 402. In addition, the plurality of alignment parts 49 and the alignment grooves 490 disposed in the first loading part 401 and the second loading part 402 may have the same structure except for differences in positions. Accordingly, the silverware 2 may be disposed in each of the first loading part 401 and the second loading part 402.

[0091] In addition, an extension line Lv of the alignment grooves 464a, 474a, and 483a formed in the first loading part 401 and a longitudinal extension line Lv of the alignment grooves 464a, 474a, and 483a formed in the second loading part 402 may be formed in parallel to each other. That is, the alignment grooves 464a, 474a, and 483a of the first loading part 401 and the alignment grooves 464b, 474b, and 483b of the second loading part 402 are not positioned on the same line. Accordingly, the pieces of silverware 2 disposed in the first loading part 401 and the second loading part 402 do not overlap each other.

[0092] In addition, the first loading part 401 and the second loading part 402 may each include first alignment parts 46a and 46b and second alignment parts 47a and 47b. In addition, the first loading part 401 and the second loading part 402 may further include third alignment parts 48a and 48b.

[0093] In detail, the first loading part 401 may be positioned in a front half portion of the entire accommodating part 410. In addition, the first loading part 401 may include the first alignment part 46a. The first alignment part 46a may be formed on at least one of the transverse ribs 452. For example, the first alignment part 46a may be formed on three transverse ribs 452 among all of the transverse ribs 45 of the first loading part 401. In addition, the first alignment part 46a may be formed on first, fifth, and eighth transverse ribs 452 forward from the transverse rib 451 at the center of the accommodating part 410.

[0094] The first alignment part 46a may be formed to protrude upward along the transverse rib 45, and a plurality of first alignment grooves 464a and first partition protrusions 461a may be continuously formed.

[0095] In detail, the first alignment grooves 464a may be recessed from an upper end of the first alignment part 46a. In addition, first partition protrusions 461a may further protrude upward at both sides of the first alignment groove 464a. That is, the first alignment groove 464a may be formed between a pair of first partition protrusions 461a. In addition, the first partition protrusions 461a may protrude upward to a height higher than an upper end of the first alignment groove 464a and lower than an upper end of the frame 41.

[0096] Meanwhile, the first alignment groove 464a may receive a lower end of the silverware 2 therein. In

addition, the first alignment groove 464a may be formed in a shape capable of inducing the silverware 2 to be aligned while being inclined in one direction in a state in which the silverware 2 is received in the first alignment groove 46a.

[0097] In detail, the first alignment groove 464a may be formed by a first inclined surface 462a and a second inclined surface 463a. The first inclined surface 462a and the second inclined surface 463a may be formed in a shape becoming narrower downward. In addition, lower ends of the first inclined surface 462a and the second inclined surface 463a may contact each other, and a portion at which the first inclined surface 462a and the second inclined surface 463a contact each other may be formed to be eccentric from a center between the neighboring first partition protrusions 461a.

[0098] For example, an inclination of the first inclined surface 462a may be formed smaller than an inclination of the second inclined surface 463a. In addition, based on an entire width W of the first alignment groove 464a, a width W1 of the first inclined surface 462a may be formed greater than half of the entire width W. In addition, the width W1 of the first inclined surface 462a may be formed greater than a width W2 of the second inclined surface 463a. In addition, an extension line Lv connecting points at which lower ends of the first inclined surfaces 462a and the second inclined surfaces 464a of the plurality of first alignment grooves 464a meet may be disposed to be eccentric from a center of the entire width W of the first alignment groove 464a. That is, a shape of the first alignment groove 464a may be formed as an asymmetric shape.

[0099] In addition, with reference to a horizontal plane passing through a point at which the first inclined surface 462a and the second inclined surface 463a contact each other, an angle $\alpha 1$ of the first inclined surface 462a may be formed smaller than an angle $\alpha 2$ of the second inclined surface 463a. That is, the first inclined surface 462a may have a gentle inclination compared to the second inclined surface 463a.

[0100] Accordingly, when the silverware 2 is seated in the first alignment groove 464a, a lower end of the silverware 2 is positioned at a portion where the first inclined surface 462a and the second inclined surface 463a contact each other. In addition, the silverware 2 is inclined by shaking of the accessory 40 or the silverware 2 caused by washing water sprayed into the washing space 110. In this case, since the first inclined surface 462a has an inclination smaller than that of the second inclined surface 463a and has a greater width, the silverware 2 may be naturally laid down and aligned in a form contacting the first inclined surface 462a.

[0101] Meanwhile, a plurality of first alignment grooves 464a may be continuously formed along the transverse rib 45. Accordingly, each piece of silverware 2 disposed in each of the first alignment grooves 464a may be aligned while being laid down in the same direction in the first alignment groove 464a. Accordingly,

pieces of silverware 2 disposed in the accommodating part 410 may not overlap each other and may maintain a state in which washing and drying are facilitated.

[0102] The first loading part 401 may include a second alignment part 47a. The second alignment part 47a may be formed on at least one of the transverse ribs 45. For example, the second alignment part 47a may be formed on one transverse rib 45 among all of the transverse ribs 45 of the first loading part 401. In addition, the second alignment part 47a may be formed on a third transverse rib 45 forward from the transverse rib 45 at the center of the accommodating part 410. In addition, the second alignment part 47a may be disposed between the first alignment parts 46a. In addition, the second alignment part 47a may be disposed between the third alignment parts 48a. The first alignment part 46a, the second alignment part 47a, and the third alignment part 48a may be sequentially disposed on neighboring transverse ribs 45.

[0103] The second alignment part 47a may be formed to protrude upward along the transverse rib 45, and a plurality of second alignment grooves 474a and second partition protrusions 471a may be continuously formed. An overall arrangement of the second alignment grooves 474a and the second partition protrusions 471a is similar to that of the first alignment part 46a, but specific shapes of the second alignment grooves 474a and the second partition protrusions 471a are somewhat different.

[0104] In detail, the second alignment groove 474a may be recessed from an upper end of the second alignment part 47a. In addition, second partition protrusions 471a may further protrude upward at both sides of the second alignment groove 474a. That is, the second alignment groove 474a may be formed between a pair of second partition protrusions 471a. In addition, the second partition protrusions 471a may protrude upward to be higher than an upper end of the second alignment groove 474a. In addition, the second partition protrusions 471a may protrude to a height corresponding to an upper end of the frame 41. In this case, a height of the second partition protrusions 471a may be formed greater than a height of the first partition protrusions 461a. In addition, protruded ends of the second partition protrusions 471a may be positioned on the same extension line Lp as protruded ends of the first partition protrusions 461a.

[0105] Meanwhile, the second alignment groove 474a may receive a lower end of the silverware 2 therein. In addition, the second alignment groove 474a may induce the silverware 2 to be aligned while being inclined in one direction in a state in which the silverware 2 is received in the second alignment groove 474a.

[0106] In detail, the second alignment groove 474a may be formed by a first inclined surface 472a and a second inclined surface 473a. The first inclined surface 472a and the second inclined surface 473a may be formed in a shape becoming narrower downward. In

addition, lower ends of the first inclined surface 472a and the second inclined surface 473a may contact each other, and a portion at which the first inclined surface 472a and the second inclined surface 473a contact each other may be formed to be eccentric from a center between the neighboring second partition protrusions 471a. That is, a shape of the second alignment groove 474a may be formed as an asymmetric shape.

[0107] For example, an inclination of the first inclined surface 472a may be formed smaller than an inclination of the second inclined surface 473a. In addition, based on an entire width W of the second alignment groove 474a, a width W1 of the first inclined surface 472a may be formed greater than half of the entire width W. In addition, the width W1 of the first inclined surface 472a may be formed greater than a width W2 of the second inclined surface 473a. In addition, an extension line Lv at which lower ends of the first inclined surface 472a and the second inclined surface 473a meet may be disposed to be eccentric from a center of the entire width W. In addition, a point at which lower ends of the first inclined surface 462a and the second inclined surface 463a of the first alignment groove 464a meet and a point at which lower ends of the first inclined surface 472a and the second inclined surface 473a of the second alignment groove 474a meet may be positioned on the same extension line Lv.

[0108] In addition, with reference to a horizontal plane passing through a point at which the first inclined surface 472a and the second inclined surface 473a contact each other, an angle $\beta 1$ of the first inclined surface 472a may be formed smaller than an angle $\beta 2$ of the second inclined surface 473a. That is, the first inclined surface 472a may have a gentle inclination compared to the second inclined surface 473a.

[0109] The first inclined surface 472a and the second inclined surface 473a formed in the second alignment groove 474a may have the same arrangement as the first inclined surface 462a and the second inclined surface 463a formed in the first alignment groove 464a, but may be somewhat different in size and shape.

[0110] In detail, angles $\beta 1$ and $\beta 2$ of the first inclined surface 472a and the second inclined surface 473a of the second alignment groove 474a may be formed greater than angles $\alpha 1$ and $\alpha 2$ of the first inclined surface 462a and the second inclined surface 463a of the first alignment groove 464a. Accordingly, even when silverware 2 having partially different thicknesses is disposed, the first alignment groove 464a and the second alignment groove 474a may provide a stable support structure and alignment structure. For example, when the silverware 2 is a knife, a handle portion having a large thickness may be aligned and disposed in the first alignment groove 464a, and a blade portion having a relatively small thickness may be aligned and disposed in the second alignment groove 474a.

[0111] When the silverware 2 is seated in the second alignment groove 474a, a lower end of the silverware 2

is positioned at a portion where the first inclined surface 472a and the second inclined surface 473a contact each other. In addition, the silverware 2 is inclined by shaking of the accessory 40 or the silverware 2 caused by washing water sprayed into the washing space 110. In this case, since the first inclined surface 472a has an inclination smaller than that of the second inclined surface 473a and has a greater width, the silverware 2 may be naturally laid down and aligned in a form contacting the first inclined surface 472a.

[0112] In addition, extension ribs 475a extending upward along the second partition protrusions 471a may be further formed at upper ends of the first inclined surface 472a and the second inclined surface 473a. The extension ribs 475a may protrude more than an outer surface of the second partition protrusions 471a such that, when the silverware 2 is disposed, the silverware 2 is spaced apart without directly contacting the second partition protrusions 471a that are elongated in the upward and downward direction. Accordingly, a space necessary for washing and drying of the silverware 2 can be further secured.

[0113] Meanwhile, a plurality of second alignment grooves 474a may be continuously formed along the transverse rib 45. Accordingly, each piece of silverware 2 disposed in each of the second alignment grooves 474a may be aligned while being laid down in the same direction in the second alignment groove 474a. Accordingly, pieces of silverware 2 disposed in the accommodating part 410 may not overlap each other and may maintain a state in which washing and drying are facilitated.

[0114] In addition, the second alignment groove 474a and the second partition protrusion 471a may be disposed on the same extension lines Lv and Lp as the first alignment groove 464a and the first partition protrusion 461a, respectively. Accordingly, the silverware 2 contacts both the first alignment groove 464a and the second alignment groove 474a, and may be mounted in an aligned state in the same direction.

[0115] The first loading part 401 may include a third alignment part 48a. The third alignment part 48a may be formed on at least one of the transverse ribs 45. For example, the third alignment part 48a may be formed on four transverse ribs 45 among all of the transverse ribs 45 of the first loading part 401. In addition, the third alignment part 48a may be formed on second, fourth, sixth, and seventh transverse ribs 45 forward from the transverse rib 45 at the center of the accommodating part 410. The third alignment part 48a may be disposed between the first alignment part 46a and the second alignment part 47a. In addition, the third alignment part 48a may be disposed between the first alignment parts 46a.

[0116] The third alignment part 48a may be formed to protrude upward along the transverse rib 45, and a plurality of third alignment grooves 483a may be continuously formed in the third alignment part 48a. The

third alignment grooves 483a may have a smaller size than the first alignment grooves 464a and the second alignment grooves 474a. In addition, the plurality of third alignment grooves 483a may be disposed between a pair of extension lines Lp connecting the first partition protrusions 461a and the second partition protrusions 471a. That is, a plurality of third alignment grooves 483a may be disposed in the same region as the first alignment grooves 464a and the second alignment grooves 474a.

[0117] The third alignment groove 483a may be formed by a first inclined surface 481a and a second inclined surface 482a. The first inclined surface 481a and the second inclined surface 482a may be formed in a shape becoming narrower downward. In addition, lower ends of the first inclined surface 481a and the second inclined surface 482a contact each other.

[0118] For example, an inclination γ_1 of the first inclined surface 481a may be formed the same as an inclination γ_2 of the second inclined surface 482a. Accordingly, the third alignment groove 483a may serve to prevent movement of the silverware 2 and assist in maintaining a state in which the silverware 2 is disposed on the first alignment groove 464a and the second alignment groove 474a, rather than being involved in alignment of the silverware 2. For example, a thin portion such as a blade of the knife may be inserted into or caught in the third alignment groove 483a.

[0119] Meanwhile, the second loading part 402 may be composed of a combination of alignment parts 46b, 47b, and 48b corresponding to the alignment parts 46a, 47a, and 48a of the first loading part 401. That is, the second loading part 402 may include a first alignment part 46b and a second alignment part 47b. In addition, the second loading part 402 may further include a third alignment part 48b. In addition, shapes and arrangement structures of the first alignment part 46b, the second alignment part 47b, and the third alignment part 48b may be the same as those of the above-described alignment parts 46a, 47a, and 48a of the first loading part 401.

[0120] The second loading part 402 may include the first alignment part 46b. The first alignment part 46b may be formed at a position symmetrical to the first alignment part 46a of the first loading part 401 with respect to the transverse rib 451 at the center of the accommodating part 410. In addition, a shape of the first alignment part 46b may be the same as the shape of the above-described first alignment part 46a of the first loading part 401, and may differ only in position. The first alignment part 46b may include a plurality of first alignment grooves 464b and first partition protrusions 461b. In addition, the first alignment groove 464b may include a first inclined surface 462b and a second inclined surface 463b. That is, a shape of the first alignment groove 464b may be formed as an asymmetric shape. The first inclined surface 462b may be formed to have an inclination smaller than that of the second

inclined surface 463b to induce one-directional alignment of the silverware 2.

[0121] In addition, the second loading part 402 may include the second alignment part 47b. The second alignment part 47b may be formed at a position symmetrical to the second alignment part 47a of the first loading part 401 with respect to the transverse rib 451 at the center of the accommodating part 410. In addition, a shape of the second alignment part 47b may be the same as the shape of the above-described second alignment part 47a of the first loading part 401, except for its position. The second alignment part 47b may include a plurality of second alignment grooves 474b and second partition protrusions 471b. In addition, the second alignment groove 474b may include a first inclined surface 472a and a second inclined surface 473a. The first inclined surface 472a may be formed to have an inclination smaller than that of the second inclined surface 473a to induce one-directional alignment of the silverware 2. That is, a shape of the second alignment groove 474b may be formed as an asymmetric shape.

[0122] The first alignment groove 464b and the second alignment groove 474b constituting the second loading part 402 may be disposed on the same extension line Lv. However, the extension line Lv of the first alignment groove 464b and the second alignment groove 474b of the second loading part 402 may be arranged in parallel without coinciding with the extension line Lv of the first alignment groove 464a and the second alignment groove 474a constituting the first loading part 401.

[0123] In addition, the second loading part 402 may include a third alignment part 48b. The third alignment part 48b may be formed at a position symmetrical to the third alignment part 48a of the first loading part 401 with respect to the transverse rib 45 at the center of the accommodating part 410, and may also be formed in the same shape. That is, the third alignment part 48b may be composed of a first inclined surface 481b and a second inclined surface 482b having the same inclination.

[0124] Hereinafter, operation of the dishwasher 1 having the above-described structure will be described.

[0125] For effective washing and drying of the silverware 2, the accessory 40 may be mounted on the rack 32. In addition, the silverware 2 may be disposed on and washed in the accessory 40. In addition, the accessory 40 may be mounted on an upper end of the rack 32.

[0126] When the accessory 40 is mounted on the upper end of the rack 32, the supporters 42 at front and rear ends of the accessory 40 may be seated on the front cover 34 at a front end of the rack 32 and the main wire 321 at a rear end of the rack 32, respectively.

[0127] In addition, the silverware 2 for washing may be disposed in the accommodating part 410 of the rack 32. For example, the silverware 2 may be a knife, and

may be disposed in the first loading part 401 and the second loading part 402, respectively, as illustrated in FIG. 4.

[0128] The silverware 2 disposed in the first loading part 401 and the second loading part 402 may be placed in the respective alignment grooves 490. That is, the silverware 2 may be independently disposed one by one without overlapping each other by the alignment grooves 46a, 47a, and 48a of the first loading part 401 disposed on the same extension line. In addition, the silverware 2 may be disposed in a state aligned in one direction by an inclined surface structure formed in the alignment grooves 46a, 47a, and 48a.

[0129] In addition, the silverware 2 may be independently disposed one by one without overlapping each other by the alignment grooves 46b, 47b, and 48b of the second loading part 402 disposed on the same extension line. In addition, the silverware 2 may be disposed in a state aligned in one direction by an inclined surface structure formed in the alignment grooves 46b, 47b, and 48b.

[0130] In this case, the extension line Lv of the alignment grooves 46a and 47a constituting the first loading part 401 and the extension line Lv of the alignment grooves 46b and 47b constituting the second loading part 402 may be arranged in parallel to each other. Accordingly, the pieces of silverware 2 seated in the first loading part 401 and the second loading part 402 do not overlap each other.

[0131] Accordingly, in a state in which a plurality of pieces of silverware 2 are disposed in the accommodating part 410, the pieces of silverware 2 do not overlap each other, and effective washing and drying operations can be performed.

[0132] Meanwhile, the present invention may have various other embodiments in addition to the above-described embodiment. Hereinafter, other embodiments of the present invention will be described in detail with reference to the drawings. In addition, configurations not described below are the same as those of the above-described embodiment, and thus detailed descriptions and illustrations thereof may be omitted to prevent repeated description, and the same reference numerals may be used for description. That is, hereinafter, only configurations different from those of the above-described embodiment will be described in detail.

[0133] FIG. 8 is a view illustrating a shape of an alignment part according to a second embodiment of the present invention.

[0134] As illustrated, a dishwasher 1 according to a second embodiment of the present invention may include an accessory 40' disposed for washing the silverware 2. In addition, a structure of the accessory 40' is the same as that of the above-described embodiment, and there is only a partial difference in a structure of an alignment part 56.

[0135] A plurality of transverse ribs 45 may be pro-

vided in an accommodating part 410 of the accessory 40', and the alignment part 56 may be disposed on at least some transverse ribs 452 among the transverse ribs 45. The alignment part 56 may include a plurality of alignment grooves 565 and partition protrusions 561. The alignment grooves 565 may be continuously formed along the alignment part 56 and may be disposed between a pair of the partition protrusions 561.

[0136] A recessed shape of the alignment groove 565 may be formed to be eccentric to one side without being symmetrical with respect to a center extension line Lc between extension lines Lp passing through the partition protrusions 561 on left and right sides. Accordingly, the silverware 2 inserted into the alignment groove 565 may be aligned while being inclined in one direction.

[0137] For example, the alignment groove 565 may include a first inclined surface 562, a second inclined surface 563, and a connecting part 564. The first inclined surface 562 and the second inclined surface 563 may form left and right sides among inner surfaces of the alignment groove 565 and may be formed to be inclined so as to become closer to each other downward. In addition, the connecting part 564 may connect lower ends of the first inclined surface 562 and the second inclined surface 563.

[0138] In this case, with reference to a horizontal line passing through a lower end of the alignment groove 565, an inclination of the first inclined surface 562 may be formed smaller than an inclination of the second inclined surface 563. In addition, a transverse width of the first inclined surface 562 may be formed greater than a transverse width of the second inclined surface 563. In addition, at least a portion of the first inclined surface 562 may pass through the center extension line Lc or may extend to an adjacent position. In addition, the first inclined surface 562 may be positioned at one side with respect to the center extension line Lc, and the connecting part 564 and the second inclined surface 563 may be positioned at the other side.

[0139] Accordingly, in a state in which the silverware 2 is disposed in the alignment groove 565, the silverware 2 may be inclined to contact the first inclined surface 562 and may be aligned in a state of contacting the first inclined surface 562. In addition, pieces of silverware 2 may be aligned in the same direction in the plurality of alignment grooves 565 disposed along the alignment part 56.

[0140] In addition, the accommodating part 410 of the accessory 40' may further include alignment parts composed of alignment grooves having different sizes on a plurality of transverse ribs 452 as in the above-described embodiment, and may have the same arrangement structure as in the above-described embodiment.

[0141] FIG. 9 is a view illustrating a shape of an alignment part according to a third embodiment of the present invention.

[0142] As illustrated, a dishwasher 1 according to a third embodiment of the present invention may include an accessory 40'' disposed for washing the silverware 2. In addition, a structure of the accessory 40'' is the same as that of the above-described embodiment, and there is only a partial difference in a structure of an alignment part 66.

[0143] A plurality of transverse ribs 45 may be provided in an accommodating part of the accessory 40'', and the alignment part 66 may be disposed on at least some transverse ribs 452 among the transverse ribs 45. The alignment part 66 may include a plurality of alignment grooves 665 and partition protrusions 661. The alignment grooves 665 may be continuously formed along the alignment part 66 and may be disposed between a pair of the partition protrusions 661.

[0144] A recessed shape of the alignment groove 665 may be formed to be eccentric to one side without being symmetrical with respect to a center extension line Lc between extension lines Lp passing through the partition protrusions 661 on left and right sides. Accordingly, the silverware 2 inserted into the alignment groove 665 may be aligned while being inclined in one direction.

[0145] For example, the alignment groove 665 may include a first side portion 662, a second side portion 663, and a connecting part 664. The first side portion 662 and the second side portion 663 may form left and right sides among inner surfaces of the alignment groove 665. The first side portion 662 and the second side portion 663 may extend in a direction crossing the connecting part 664. The first side portion 662 and the second side portion 663 may extend perpendicular to the connecting part 664.

[0146] The connecting part 664 may connect lower ends of the first side portion 662 and the second side portion 663. In addition, the connecting part 664 may be formed to have the same height from one end to the other end. In addition, the connecting part 664 may extend parallel to an upper end of the alignment part 66.

[0147] In this case, the first side portion 662 may be formed closer to the center extension line Lc, which is an intermediate point between the extension lines Lp passing through the partition protrusions 661 on both sides, than the second side portion 663. In addition, the connecting part 664 may be formed to extend further toward the second side portion 663 with respect to the center extension line Lc.

[0148] Accordingly, in a state in which the silverware 2 is disposed in the alignment groove 665, the silverware 2 may be inclined to contact the first side portion 662 and may be aligned in a state of contacting the first side portion 662. In addition, pieces of silverware 2 may be aligned in the same direction in the plurality of alignment grooves 665 disposed along the alignment part 66.

[0149] In addition, the accommodating part 410 of

the accessory 40" may further include an alignment part composed of alignment grooves having different sizes on a plurality of transverse ribs 452 as in the above-described embodiment, and may have the same arrangement structure as in the above-described embodiment.

[0150] FIG. 10 is a view illustrating a shape of an alignment part according to a fourth embodiment of the present invention.

[0151] As illustrated, a dishwasher 1 according to a fourth embodiment of the present invention may include an accessory 40" disposed for washing the silverware 2. A structure of the accessory 40" is the same as that of the above-described embodiment, and there is only a partial difference in a structure of an alignment part 76.

[0152] A plurality of transverse ribs 45 may be provided in an accommodating part 410 of the accessory 40", and the alignment part 76 may be disposed on at least some transverse ribs 452 among the transverse ribs 45. The alignment part 76 may include a plurality of alignment grooves 765 and partition protrusions 761. The alignment grooves 765 may be continuously formed along the alignment part 76 and may be disposed between a pair of the partition protrusions 761.

[0153] A recessed shape of the alignment groove 765 may be formed to be eccentric to one side without being symmetrical with respect to a center extension line Lc between extension lines Lp passing through the partition protrusions 761 on left and right sides. Accordingly, the silverware 2 inserted into the alignment groove 765 may be aligned while being inclined in one direction.

[0154] For example, the alignment groove 765 may have an inner surface having a rounded shape. In particular, the alignment groove 765 may have a shape in which a bottom is rounded to induce the silverware 2 to be inclined in one direction.

[0155] In detail, the alignment groove 765 may include a first round portion 762, a second round portion 763, and a connecting part 764. The first round portion 762 and the second round portion 763 may be formed to become closer to each other as extending downward, and may be formed to be rounded with the same curvature.

[0156] In addition, a lower end of the first round portion 762 and a lower end of the second round portion 763 may be connected by the connecting part 764. The connecting part 764 may be formed such that a central portion is formed lowest, and may be formed in a rounded shape. The first round portion 762, the second round portion 763, and the connecting part 764 may be formed as an overall continuous rounded shape.

[0157] Meanwhile, a recessed central portion of the connecting part 764 may be positioned at a position spaced apart to one side from a center extension line Lc, which is an intermediate point between extension lines Lp passing through the partition protrusions 761

on both sides. In detail, the first round portion 762 may be disposed closer to the center extension line Lc than the second round portion 763. Accordingly, the alignment groove 765 may be formed at a position biased to one side between the partition protrusions 761.

[0158] Accordingly, in a state in which the silverware 2 is disposed in the alignment groove 765, the silverware 2 may be inclined to contact the first round portion 762 and may be aligned in a state of contacting the first round portion 762. In addition, pieces of silverware 2 may be aligned in the same direction in the plurality of alignment grooves 765 disposed along the alignment part 76.

[0159] In addition, the accommodating part 410 of the accessory 40 may further include an alignment part composed of alignment grooves having different sizes on a plurality of transverse ribs as in the above-described embodiment, and may have the same arrangement structure as in the above-described embodiment.

INDUSTRIAL APPLICABILITY

[0160] The dishwasher according to an embodiment of the present invention has high industrial applicability because washing and drying performance is ensured and accommodating efficiency is improved.

Claims

1. A dishwasher, comprising:

a body forming a washing space having an open front surface;
a door opening and closing the washing space;
a rack provided to be withdrawn and inserted in front and rear directions in the washing space and in which dishes for washing are accommodated; and
an accessory seated on the rack and on which silverware for washing is placed,
wherein the accessory comprises:

a frame forming a periphery of an accommodating part on which the silverware is seated;
a first loading part formed at one side of the accommodating part and comprising a plurality of alignment grooves allowing the silverware to be loaded; and
a second loading part formed at the other side of the accommodating part and comprising a plurality of alignment grooves allowing the silverware to be loaded,
wherein the first loading part and the second loading part are disposed at positions facing each other with respect to a center

- of the accommodating part, and
wherein an extension line of the alignment
groove of the first loading part and an ex-
tension line of the alignment groove of the
second loading part are arranged in paral-
5 lel while being spaced apart from each
other.
2. The dishwasher of claim 1,
wherein the accommodating part comprises: 10
- a plurality of longitudinal ribs extending along a
length direction of the frame and spaced apart
from each other; and
a plurality of transverse ribs crossing the long-
itudinal ribs and spaced apart from each other,
and
wherein the alignment grooves are continu-
ously arranged along the transverse ribs. 20
3. The dishwasher of claim 2,
wherein the alignment grooves are formed in trans-
verse ribs other than a transverse rib disposed at a
center of the accommodating part among the plur-
ality of transverse ribs. 25
4. The dishwasher of claim 2,
wherein the alignment grooves formed in the
plurality of transverse ribs constituting the first
loading part are disposed on the same exten-
sion line, 30
wherein the alignment grooves formed in the
plurality of transverse ribs constituting the sec-
ond loading part are disposed on the same ex-
tension line, and 35
wherein the extension line of the first loading
part and the extension line of the second load-
ing part are different extension lines. 40
5. The dishwasher of claim 4,
wherein the plurality of alignment grooves dis-
posed in the same transverse rib among the plural-
ity of transverse ribs are all formed in the same
shape. 45
6. The dishwasher of claim 4,
wherein the plurality of alignment grooves dis-
posed in different transverse ribs formed on the
same extension line are formed in different shapes. 50
7. The dishwasher of claim 2,
wherein a partition protrusion protruding upward
from both sides of the alignment groove and parti-
tioning between pieces of silverware disposed in
the alignment groove is formed on the transverse
rib. 55
8. The dishwasher of claim 7,
wherein partition protrusions formed on the
plurality of transverse ribs constituting the first
loading part are disposed on the same exten-
sion line,
wherein partition protrusions formed on the
plurality of transverse ribs constituting the sec-
ond loading part are disposed on the same ex-
tension line, and
wherein the extension line of the first loading
part and the extension line of the second load-
ing part are different extension lines.
9. The dishwasher of claim 8,
wherein the partition protrusions disposed on
the same transverse rib have the same height,
and
wherein the partition protrusions disposed on
the same extension line are formed to have
different heights.
10. The dishwasher of claim 1,
wherein the alignment groove comprises a first
inclined surface and a second inclined surface
having different inclinations, and
wherein the alignment groove is formed such
that the same shape is continuously formed.
11. The dishwasher of claim 10,
wherein a point at which lower ends of the first
inclined surface and the second inclined surface
meet is formed to be eccentric with respect to a
center of the alignment groove.
12. The dishwasher of claim 2,
wherein the alignment groove comprises a first
alignment groove continuously formed in plur-
ality along at least one transverse rib among
the plurality of transverse ribs, and
wherein first partition protrusions protruding
upward and partitioning between pieces of sil-
verware disposed in the first alignment groove
are formed at both sides of the first alignment
groove.
13. The dishwasher of claim 12,
wherein the alignment groove comprises a
second alignment groove continuously formed
in plurality along another transverse rib other
than the transverse rib in which the first align-
ment groove is formed among the plurality of
transverse ribs,
wherein second partition protrusions protrud-

ing upward and partitioning between pieces of silverware disposed in the second alignment groove are formed at both sides of the second alignment groove, and
wherein the first partition protrusions and the second partition protrusions have different heights. 5

14. The dishwasher of claim 13,

wherein the alignment groove comprises a third alignment groove continuously formed in plurality along another transverse rib other than the transverse rib in which the first alignment groove is formed and the transverse rib in which the second alignment groove is formed among the plurality of transverse ribs, and
wherein the third alignment groove is formed smaller than sizes of the first alignment groove and the second alignment groove. 10 15 20

15. The dishwasher of claim 13,

wherein inclinations of inclined surfaces of the first alignment groove and the second alignment groove are formed differently from each other. 25

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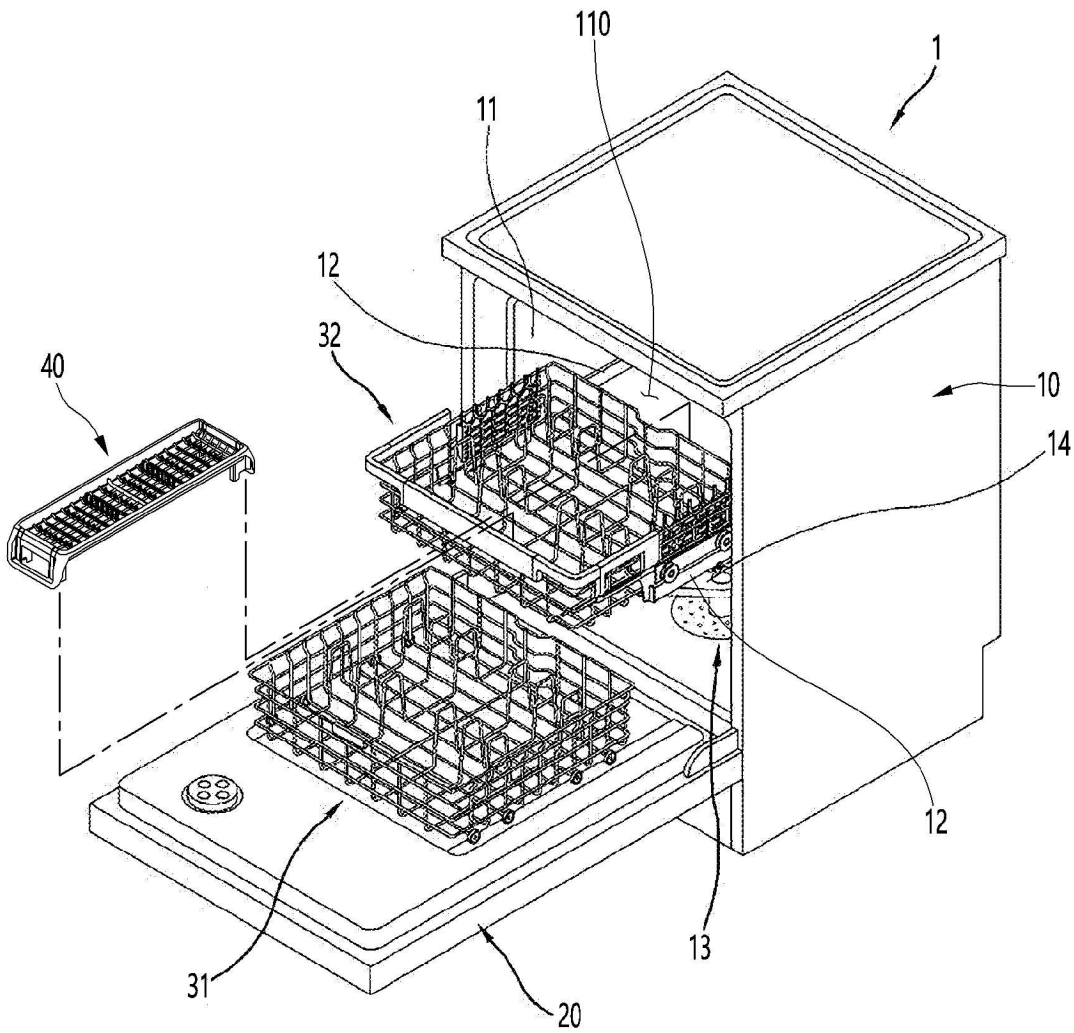
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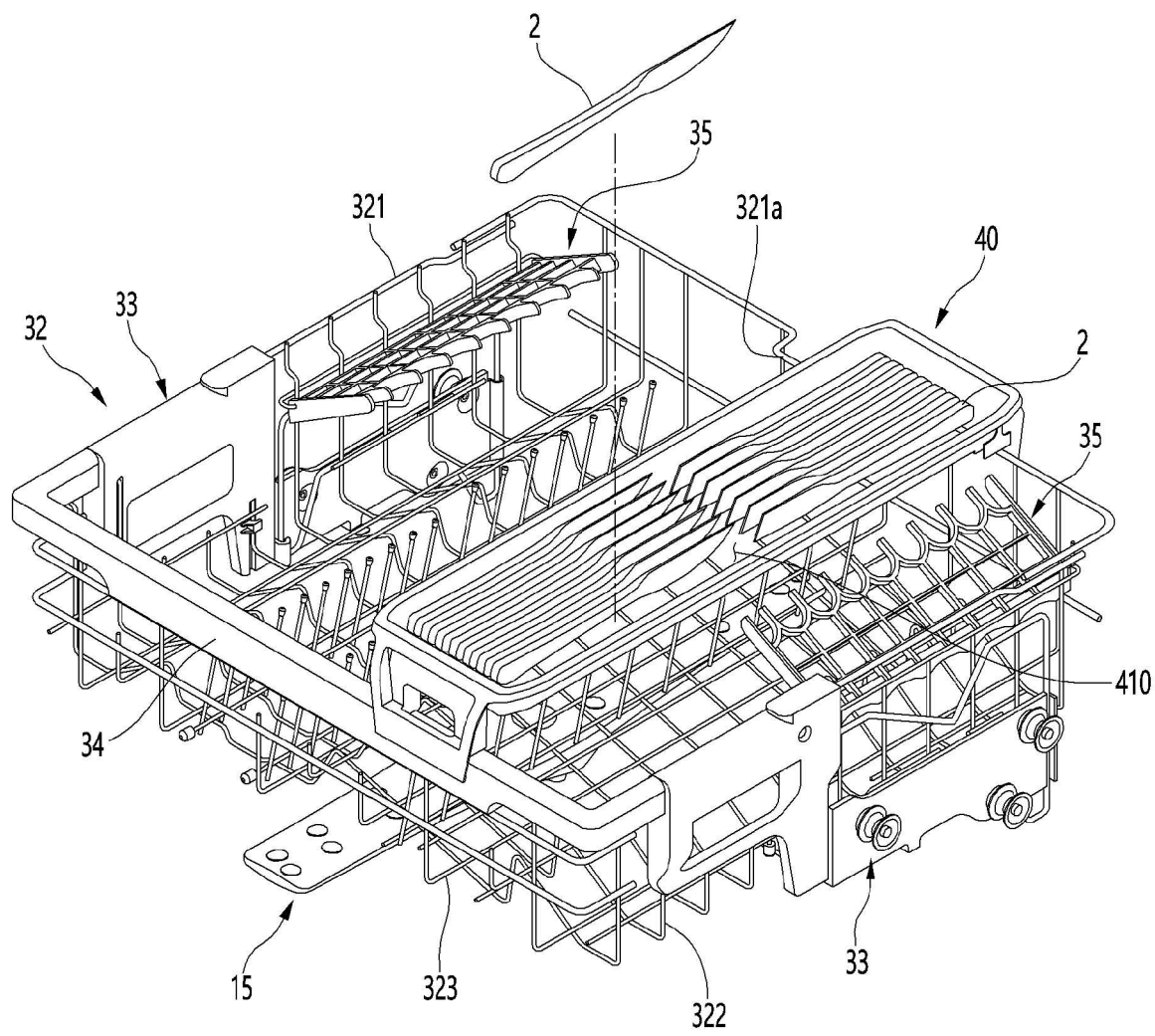
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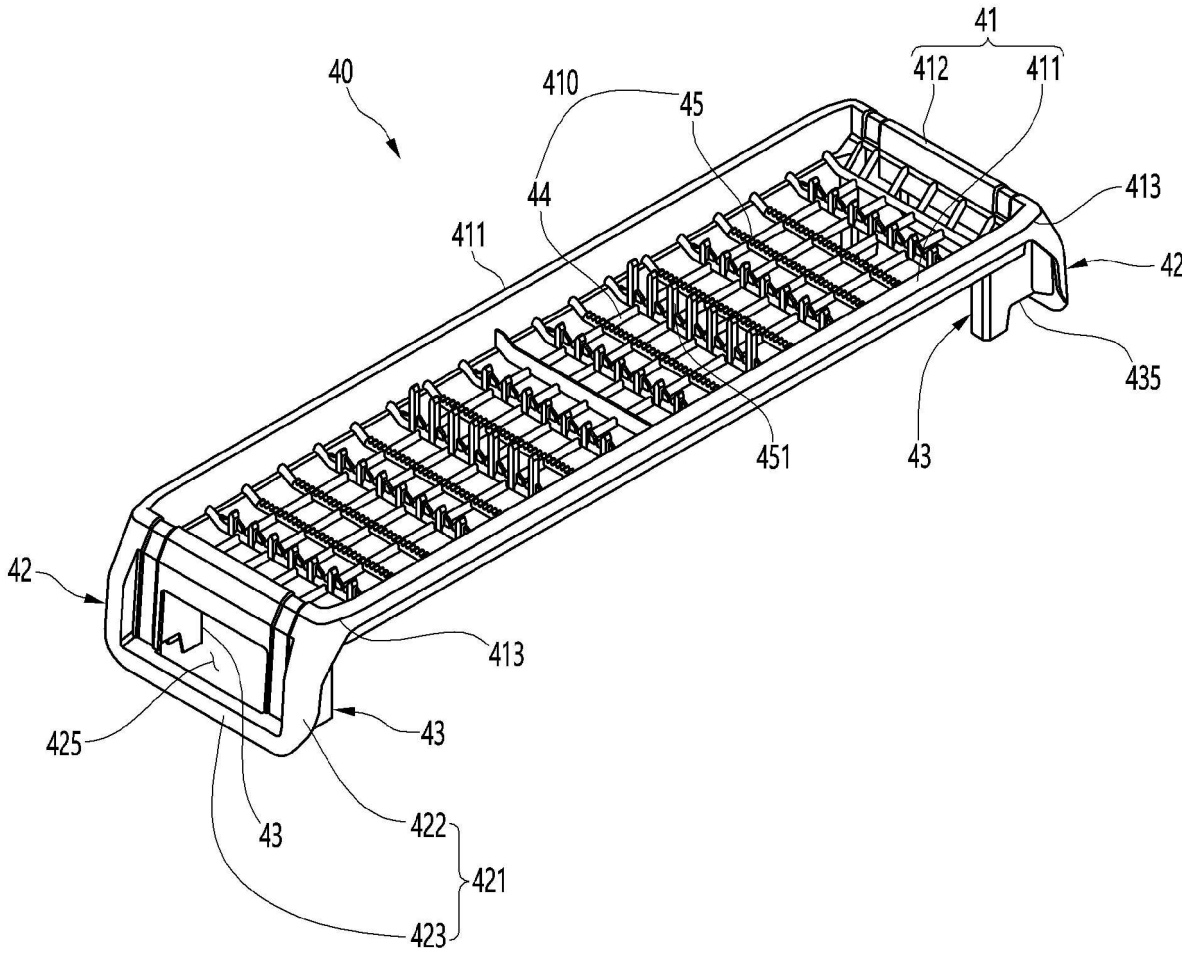
【Fig. 1】



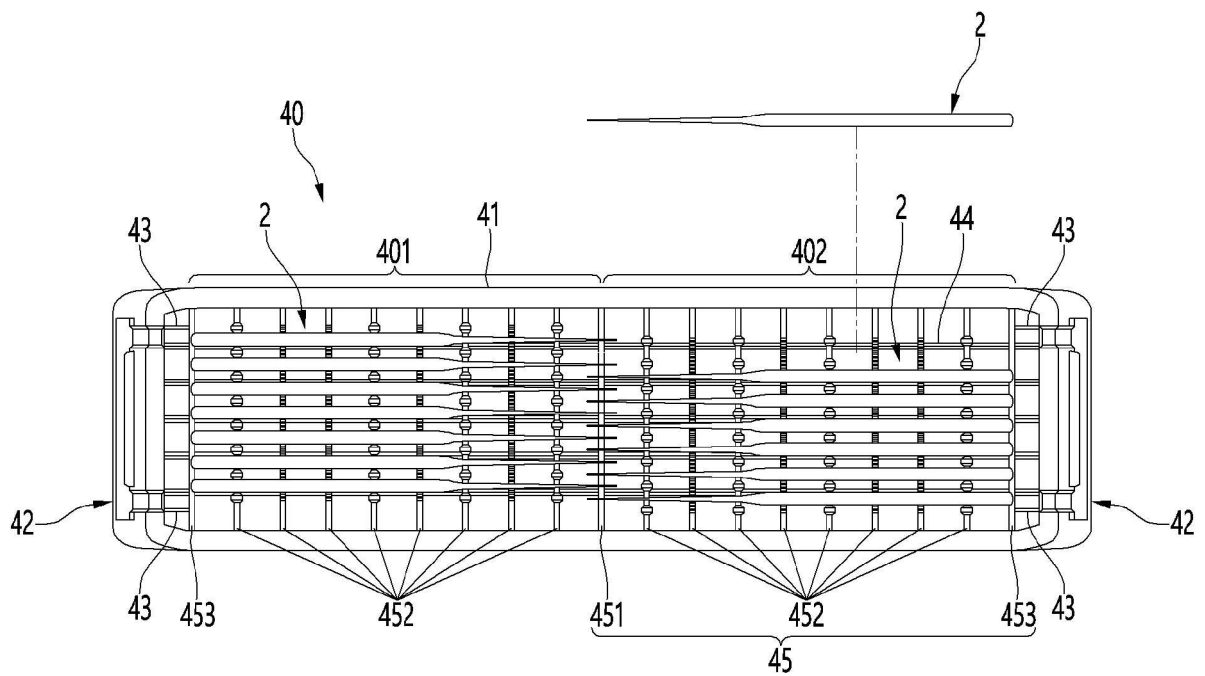
【Fig. 2】



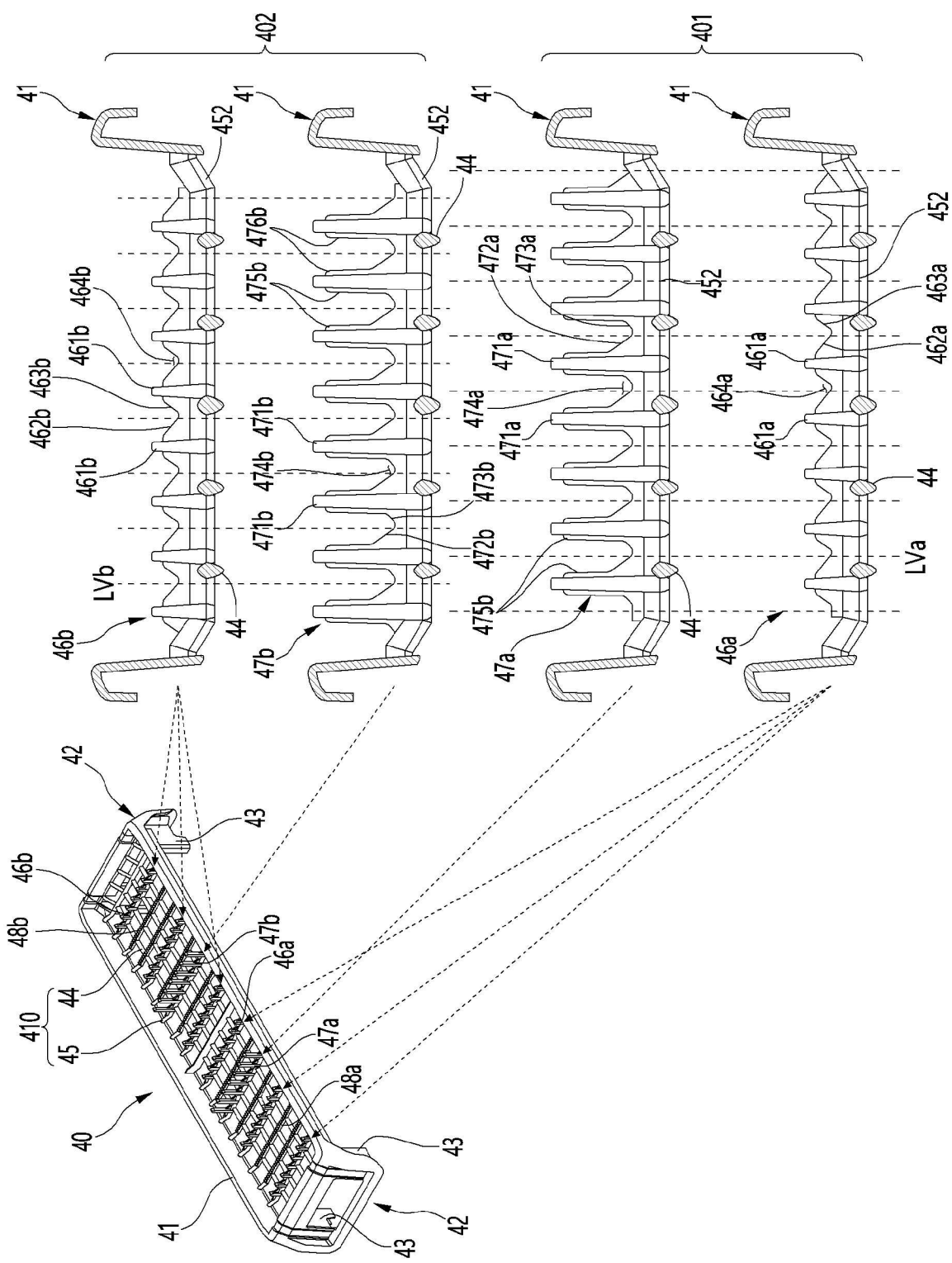
【Fig. 3】



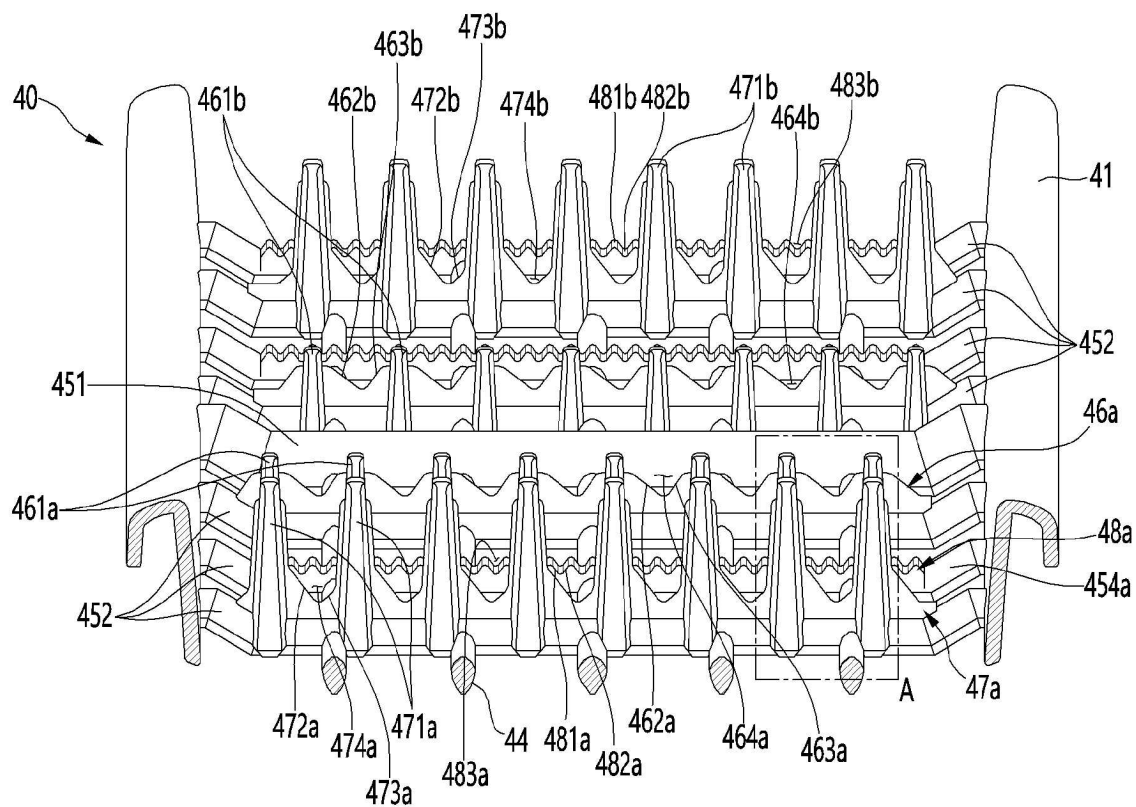
【Fig. 4】



【Fig. 5】



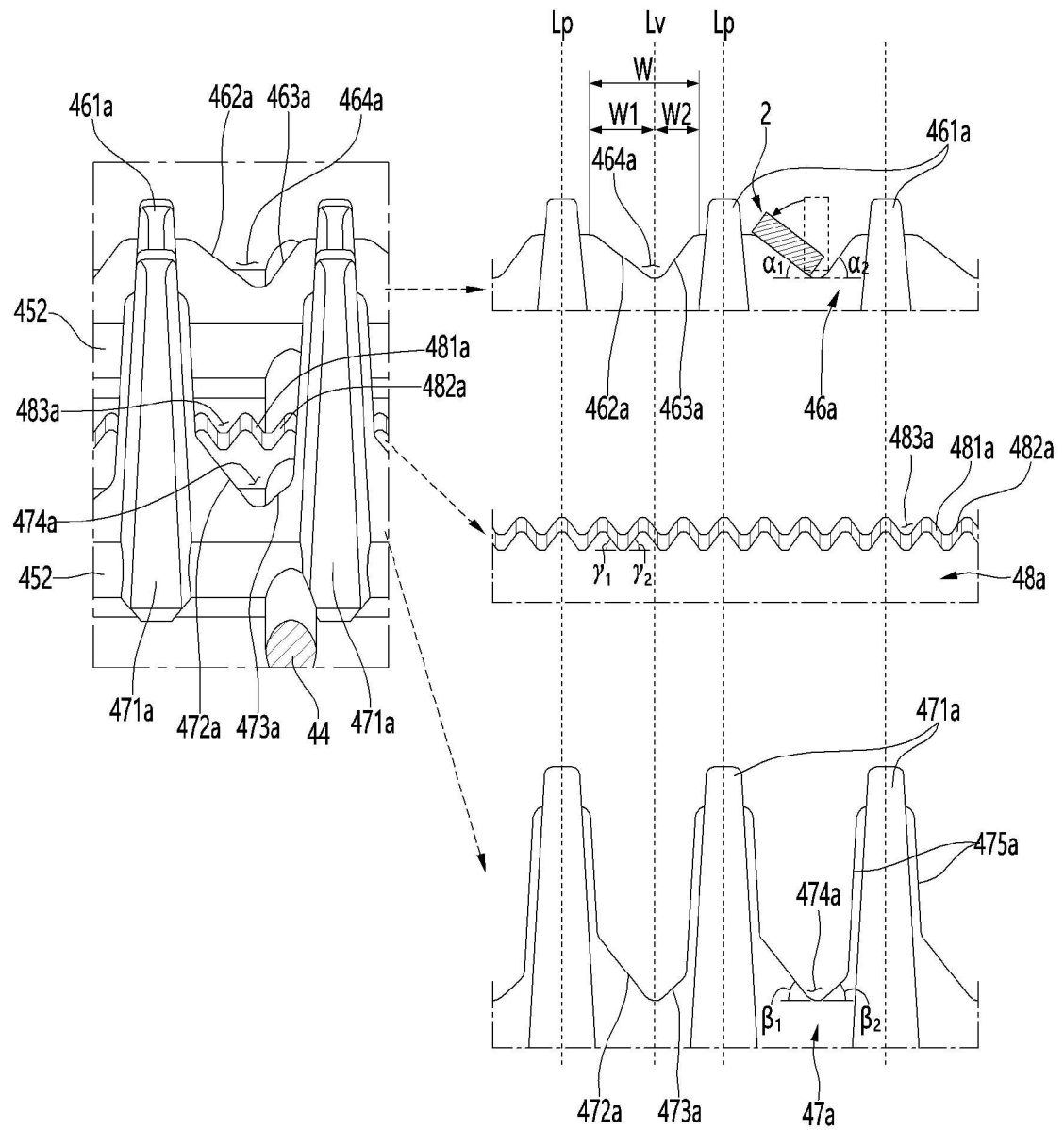
【Fig. 6】



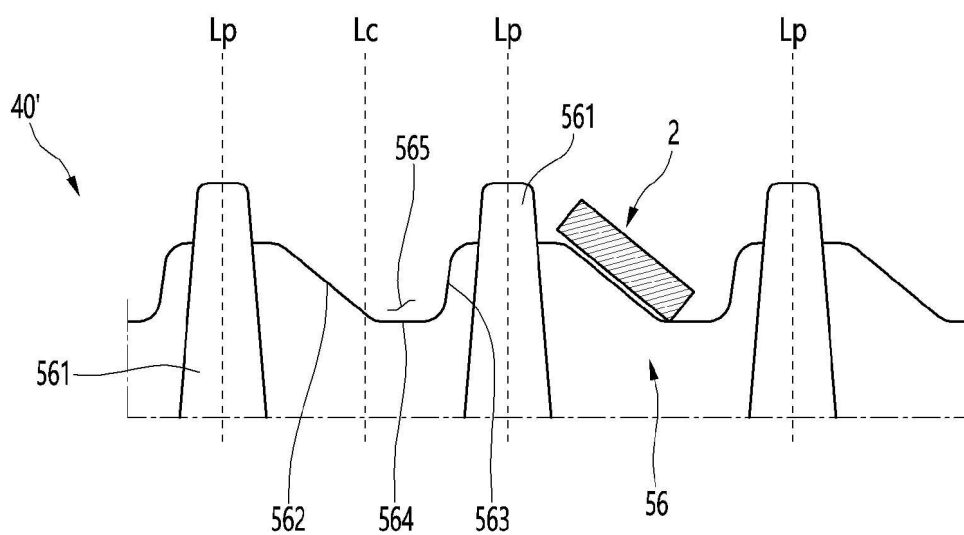
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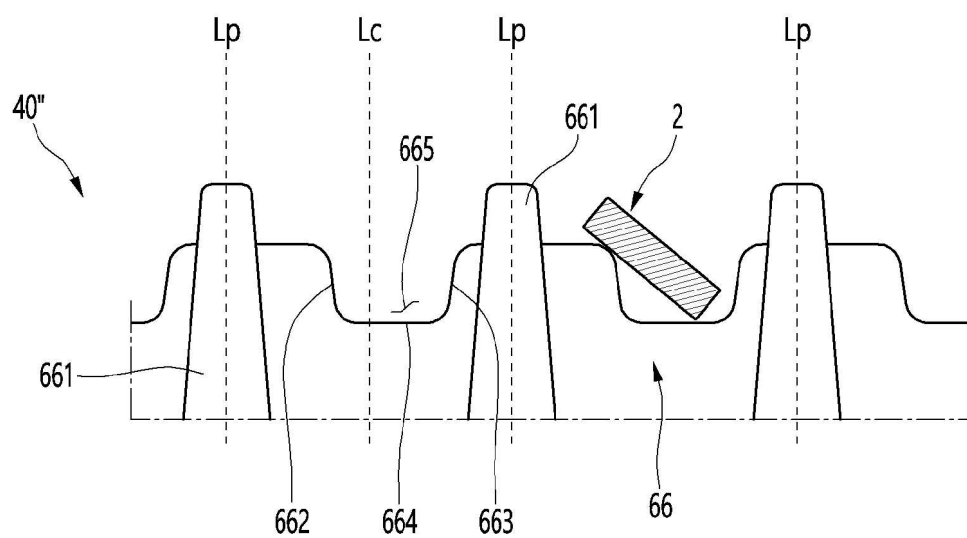
【Fig. 7】



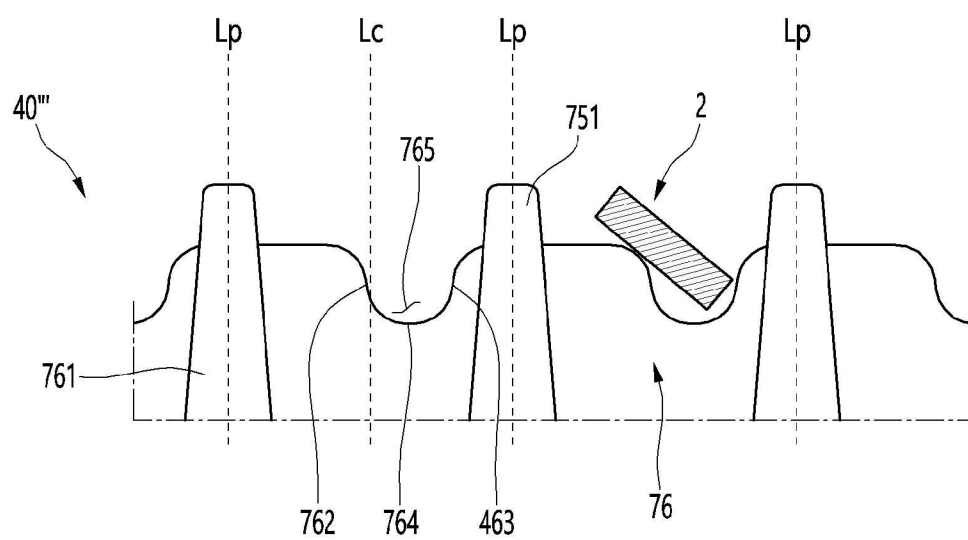
【Fig. 8】



【Fig. 9】



【Fig. 10】



INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2025/000639

A. CLASSIFICATION OF SUBJECT MATTER

A47L 15/50(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A47L 15/50(2006.01)

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: IPC as above

Japanese utility models and applications for utility models: IPC as above

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

eKOMPASS (KIPO internal) & keywords: 식기세척기(dishwasher), 컷러리(cutlery), 실버웨어(silverware), 랙(rack), 트레이(tray), 액세서리(accessory), 정렬홈(alignment groove), 리브(rib), 돌기(protrusion)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 2023-274681 A1 (MIELE & CIE. KG) 05 January 2023 (2023-01-05) See pages 10-14 and figures 1-16.	1-15
Y	CN 219557218 U (WUHU MIDEA INTELLIGENT KITCHEN ELECTRICITY MANUFACTURING CO., LTD.) 22 August 2023 (2023-08-22) See paragraphs [0046]-[0047] and figures 1-2.	1-15
A	CN 220024988 U (QINGDAO HAIER DISHWASHER CO., LTD. et al.) 17 November 2023 (2023-11-17) See claim 1 and figures 1-4.	1-15
A	CN 215738793 U (HANGZHOU ROBAM APPLIANCES CO., LTD.) 08 February 2022 (2022-02-08) See paragraphs [0030]-[0048] and figures 1-6.	1-15
A	KR 10-2022-0059163 A (SAMSUNG ELECTRONICS CO., LTD.) 10 May 2022 (2022-05-10) See paragraphs [0070]-[0072] and figures 1-7.	1-15

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

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“L” document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

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“P” document published prior to the international filing date but later than the priority date claimed

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

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

“&” document member of the same patent family

Date of the actual completion of the international search

14 April 2025

Date of mailing of the international search report

15 April 2025

Name and mailing address of the ISA/KR

Korean Intellectual Property Office
Government Complex-Daejeon Building 4, 189 Cheongsaro, Seo-gu, Daejeon 35208

Facsimile No. +82-42-481-8578

Authorized officer

Telephone No.

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/KR2025/000639

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				DE	102021116816	B4	19 January 2023
				EP	4362762	A1	08 May 2024
				EP	4362762	B1	02 October 2024
				US	12042115	B1	23 July 2024
				US	2024-0260809	A1	08 August 2024

CN	219557218	U	22 August 2023	None			

CN	220024988	U	17 November 2023	None			

CN	215738793	U	08 February 2022	None			

KR	10-2022-0059163	A	10 May 2022	US	11969130	B2	30 April 2024
				US	2022-0133124	A1	05 May 2022
				WO	2022-092674	A1	05 May 2022
