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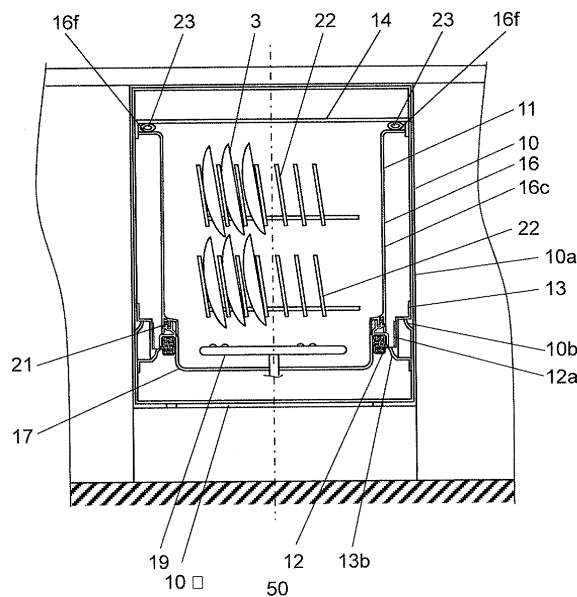
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(54) **DISHWASHER**

(57) Dishwasher (50) includes washing tub (11) arranged in housing (10) that opens to a front side and for accommodating dishes (3) to be washed, slide mechanism (12) attached on both sides of washing tub (11) and for supporting washing tub (11) so as to be movable

in a front and back direction, and rail attachment member (13) for fixing slide mechanism (12) and housing (10). A cross-sectional shape formed by rail attachment member (13) and side walls (10a) of housing (10) is a rectangle or a box shape when rail attachment member (13) is attached to housing (10).

FIG. 2



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Description

TECHNICAL FIELD

5 **[0001]** The present invention relates to a built-in type dishwasher for washing dishes by spraying washing water from a washing nozzle toward the dishes.

BACKGROUND ART

10 **[0002]** A configuration of conventional dishwasher 100 will be described.

[0003] FIG. 6 is a side view showing an internal configuration of conventional dishwasher 100, and FIG. 7 is a front view thereof. As shown in FIG. 6 and FIG. 7, dishwasher 100 is accommodated in a kitchen unit, and includes washing tub 102 inside metal housing 101 having an opening on a front side.

15 **[0004]** Washing tub 102 has opening 102a on an upper side, and interiorly includes washing basket 104 for accommodating dishes 103. Washing nozzle 105 is rotatably arranged beneath washing basket 104, where washing water accumulated in washing tub 102 is circulated by washing pump 106 and sprayed from washing nozzle 105 to wash dishes 103.

[0005] Slide mechanism 107, which is configured by a rail or the like, is fixed at a side of washing tub 102, so that washing tub 102 is supported so as to be movable in parallel in a front and back direction.

20 **[0006]** When putting in or taking out dishes 103, a user pulls out washing tub 102 forward from housing 101, and accommodates dishes 103 through opening 102a. The user then returns and accommodates washing tub 102 in housing 101. Lid body 108, which is waiting in an upper space in housing 101, then lowers while moving backward by means of link mechanism 109 or the like arranged on an inner side surface of housing 101, thus closing opening 102a of washing tub 102.

25 **[0007]** Metal housing 101 is made of a thin rolled steel plate. Rail holding portion 101a is formed by performing press working on left and right side walls of housing 101. Rail holding portion 101a holds washing tub 102 accommodating dishes 103 by way of slide mechanism 107 (refer to PTL 1, for example).

30 **[0008]** However, the number of dishes that can be accommodated increases as dishwasher 100 becomes larger. In the conventional configuration, the strength of the portion that supports washing tub 102 by way of slide mechanism 107 lacks in conventional housing 101 when the weight of washing tub 102 is increased. Thus, washing tub 102 may move downward, and the water tightness of the portion that closes opening 102a on the upper side of washing tub 102 with lid body 108 may lower. It is necessary to reinforce the portion that supports washing tub 102, but the cost increases if the thickness of housing 101 is increased.

35 **[0009]** Furthermore, there is a limit to the depth of press working on the side walls of housing 101. The work may become difficult or deformation may easily occur if pressing is performed deep, which may impair the function of the outer contour structure.

Citation List

40 Patent Literature

[0010] PTL1: Unexamined Japanese Patent Publication No. 2004-154223

SUMMARY OF THE INVENTION

45 **[0011]** The present invention reinforces only the necessary portion of the housing in a dishwasher to be enlarged. The present invention provides a dishwasher having a housing structure that facilitates the work while ensuring the strength without increasing the cost.

50 **[0012]** A dishwasher of the present invention includes a washing tub arranged in a housing that opens to a front side and for accommodating dishes to be washed, a slide mechanism attached on both sides of the washing tub and for supporting the washing tub so as to be movable in a front and back direction, and a rail attachment member for fixing the slide mechanism and the housing. A cross-sectional shape formed by the rail attachment member and the side walls of the housing is a rectangle or a box shape when the rail attachment member is attached to the housing.

55 **[0013]** Therefore, the housing structure that reinforces only the portion necessary for the housing of the dishwasher to be enlarged, and facilitates the work while ensuring strength without increasing the cost can be realized.

BRIEF DESCRIPTION OF DRAWINGS

[0014]

- 5 FIG. 1 is a side view showing an internal configuration of a dishwasher according to an exemplary embodiment of the present invention.
 FIG. 2 is a front view showing an internal configuration of the dishwasher according to the exemplary embodiment of the present invention.
 FIG. 3 is a front view showing a detailed configuration of a portion that supports a washing tub of the dishwasher according to the exemplary embodiment of the present invention.
 10 FIG. 4 is a side view showing an internal configuration of another dishwasher using the same bottom portion configuring member according to the exemplary embodiment of the present invention.
 FIG. 5 is a front view showing the main parts of the internal configuration of another dishwasher using the same bottom portion configuring member according to the exemplary embodiment of the present invention.
 15 FIG. 6 is a side view showing an internal configuration of a conventional dishwasher.
 FIG. 7 is a front view showing the internal configuration of the conventional dishwasher.

DESCRIPTION OF EMBODIMENT

- 20 **[0015]** An exemplary embodiment of the present invention will be hereinafter described with reference to the drawings. It should be noted that the present invention is not limited by the exemplary embodiment.
[0016] First, a configuration of dishwasher 50 according to an exemplary embodiment of the present invention will be described.
[0017] FIG. 1 is a side view showing an internal configuration of dishwasher 50 according to an exemplary embodiment of the present invention, FIG. 2 is a front view showing the internal configuration of dishwasher 50, and FIG. 3 is a front view showing a detailed configuration of a portion that supports washing tub 11 of dishwasher 50.
 25 **[0018]** As shown in FIG. 1 to FIG. 3, dishwasher 50 includes washing tub 11 which accommodates dishes 3 as objects to be washed, and which is accommodated inside metal housing 10 having an opening on a front side. Washing tub 11 has opening 11a on an upper side.
 30 **[0019]** Washing tub 11 is held to be movable in a front and back direction by slide mechanism 12, which is fixed at a lower side on both sides of the washing tub. Slide mechanism 12 is supported by rail attachment member 13 provided on an inner side of left and right side walls 10a of housing 10.
[0020] Slide mechanism 12 includes fixed rail portion 12a fixed to rail attachment member 13, and movable rail portion 12b fixed to washing tub 11. A plurality of rolling bodies 30 arranged between fixed rail portion 12a and movable rail portion 12b cause movable rail portion 12b to be movable in a longitudinal direction (front and back direction when incorporated in dishwasher 50) with respect to fixed rail portion 12a.
 35 **[0021]** When putting in or taking out dishes 3, a user pulls out washing tub 11 forward from housing 10, and puts in or takes out dishes 3 through opening 11a. The user then returns and accommodates washing tub 11 in housing 10. Lid body 14, which is waiting in an upper space in housing 10, then lowers while moving backward by means of link mechanism 15 arranged on an inner side surface of housing 10. Lid body 14 water-tightly closes opening 11 a of washing tub 11 by way of seal member 23 provided on an outer periphery of an inner surface of lid body 14.
 40 **[0022]** Metal housing 10 has left and right side walls 10a and bottom surface 10f integrally formed by performing bending work on a thin rolled steel plate. Rail attachment member supporting portion 10b that projects out inward is formed at plural areas of the same height position in left and right side walls 10a by performing the press working (more specifically, louver working in which the upper side is opened). Rail attachment member supporting portion 10b holds washing tub 11, in which dishes 3 are accommodated, from the lower side by way of rail attachment member 13 and slide mechanism 12. Dishwasher 50 is larger than the conventional dishwasher in width and in height.
 45 **[0023]** Rail attachment member 13 is formed long such that the cross-section has a substantially horseshoe shape (ll in Greek letter) by performing bending work, or the like on the thin rolled steel plate, same as with housing 10. Rail attachment member 13 includes step portion 13a positioned on the inner side of housing 10 when attached to side wall 10a of housing 10. Rail attachment member 13 is configured such that the cross-sectional shape is a rectangle or a box shape when attached to housing 10.
[0024] Rail holding portion 13b for supporting and holding fixed rail portion 12a of slide mechanism 12 from the lower side is integrally formed so as to project out inward by performing the press working (more specifically, louver working in which the upper side is opened) at plural areas in the lowermost portion of step portion 13a.
 50 **[0025]** Rail attachment member 13 includes upper flange portion 13c and lower flange portion 13d on upper side and lower side of the portion having a substantially horseshoe shaped cross-section. Rail attachment member 13 is fixed by a few screws with respect to side wall 10a of housing 10 at upper flange portion 13c and lower flange portion 13d.

[0026] Upper attachment portion 10c that faces upper flange portion 13c of side wall 10a of housing 10 and lower attachment portion 10d that faces lower flange portion 13d are respectively subjected to press working to be formed in a manner recessed inward over substantially the entire length in a depth direction. This enhances the strength of side wall 10a.

[0027] Furthermore, upper attachment portion 10c and lower attachment portion 10d have a difference in level in the degree of inward projection. In other words, upper attachment portion 10c is on the inner side of lower attachment portion 10d. In accordance therewith, rail attachment member 13 is configured such that upper flange portion 13c is on the inner side of lower flange portion 13d.

[0028] Outward projection 10e formed by not performing the press working is provided between upper attachment portion 10c and lower attachment portion 10d. Outward projection 10e is also formed to project outward over substantially the entire length in the depth direction.

[0029] Washing tub 11 is configured by resin washing tub member 16, which configures at least the side surface, and resin bottom portion configuring member 17, which configures at least the bottom portion. Bottom portion configuring member 17 is formed into a bottomed tray shape, and seal member 18 including an elastic body such as rubber is arranged at outer peripheral upper end 17a.

[0030] Groove portion 17b, which is opened to the upper side for holding seal member 18, is formed to an annular shape on outer peripheral upper end 17a. On bottom portion configuring member 17, a large part of the electrical components and mechanism components necessary for the operation control of dishwasher 50 such as movable rail portion 12b of slide mechanism 12, washing nozzle 19, washing pump 20, and the like is mounted and formed as a unit. Thus, even if washing tub member 16 of a different size is attached to bottom portion configuring member 17, it can function as dishwasher 50.

[0031] Seal rib 16b that holds down seal member 18 from the upper side and that exhibits water tightness in cooperation with groove portion 17b of bottom portion configuring member 17 is provided on outer peripheral lower end 16a at the front, back, left, and right of washing tub member 16.

[0032] Outer peripheral upper end 17a of bottom portion configuring member 17 and outer peripheral lower end 16a of washing tub member 16 are joined in an up and down direction. The joining portion is provided with seal unit 21 configured by groove portion 17b, seal rib 16b, and seal member 18 to water-tightly seal the joining portion.

[0033] Left and right side wall portions 16c of washing tub member 16 are extended downward so that seal unit 21 covers the attachment position of slide mechanism 12 in a width direction from the upper side.

[0034] Washing basket 22 that accommodates dishes 3 inside is arranged on the upper side of seal unit 21 in washing tub 11. Washing nozzle 19 is rotatably arranged on the lower side of washing basket 22, where the washing water accumulated in washing tub 11 is circulated by washing pump 20 and sprayed from washing nozzle 19 to wash dishes 3.

[0035] The operations and the effects of dishwasher 50 configured as above will be described below.

[0036] First, a method of assembling washing tub 11 in housing 10 so as to be movable in the front and back direction will be described. As described above, rail attachment member 13 has a difference in level in the width direction between upper flange portion 13c and lower flange portion 13d, and thus a pair of symmetrical parts are to be prepared. A pair of symmetrical slide mechanisms 12 are similarly positioned on rail attachment member 13 by bringing the bottom surface of fixed rail portion 12a into contact with the upper end face of rail holding portion 13b of rail attachment member 13. In this state, the side surface of fixed rail portion 12a is fixed to step portion 13a of rail attachment member 13 with a screw.

[0037] Then, a pair of left and right rail attachment members 13 attached with slide mechanism 12 are fixed with screws to left and right side walls 10a of housing 10, upper flange portion 13c is fixed with screws to upper attachment portion 10c, and lower flange portion 13d is fixed with screws to lower attachment portion 10d at plural areas.

[0038] In this case, the inner side surface of the upper surface of rail attachment member 13 is fixed with screws while being mounted on the upper end face of rail attachment member supporting portion 10b provided on side wall 10a of housing 10. The position in the height direction of slide mechanism 12 is thereby determined. Left and right slide mechanisms 12 are attached to left and right side walls 10a of housing 10 in such manner.

[0039] The assembly of washing tub 11 is carried out in the following manner. Washing tub member 16 is inserted from the upper side of bottom portion configuring member 17 set with seal member 18. Engagement portion 16d provided at a downward extending part of side wall portion 16c thus temporarily deforms by its own elasticity. Engagement hole 16e engages projection 17c arranged on bottom portion configuring member 17 thus enabling regulation in the up and down direction, and washing tub member 16 and bottom portion configuring member 17 are coupled and integrated to complete washing tub 11. In this case, seal rib 16b of washing tub member 16 pushes seal member 18 from the upper side and deforms it to a defined fastening position, thus forming seal unit 21 and water sealing the joining portion.

[0040] Furthermore, assembled washing tub 11 is mounted on movable rail portions 12b of left and right slide mechanisms 12 assembled to housing 10, and fixed with a screw or the like to movable rail portion 12b when the position in the depth direction is determined. Washing tub 11 is thus supported to be movable in the front and back direction with respect to housing 10.

[0041] In this state, rail attachment member 13, which cross-section is substantially formed to a horseshoe shape,

and side wall 10a of housing 10 form a rectangular or a box shaped cross-section. Outward projection 10e is formed at the portion of side wall 10a in which the cross-section is a rectangle or a box shape. The portion where the load of washing tub 11 accommodating dishes 3 is applied in side wall 10a of housing 10 is thus exclusively and intensively reinforced, the downward deformation strength is enhanced, and washing tub 11 is suppressed from moving downward.

5 [0042] With penetration of built-in type dishwasher 50 into the market, there is a growing need for enlargement. In order to respond to such a need, dishwasher 50 needs to have a larger outer contour or increase the capacity of dishes 3 that can be accommodated in washing tub 11. In a kitchen unit, a defined space (e.g., width of 450 mm, height of 800 mm) for building in dishwasher 50 is ensured. Thus, upon enlarging dishwasher 50, the width of the outer contour first needs to be maximized in the defined space, and the height needs to be made as high as possible. Furthermore, within
10 dishwasher 50, the capacity is increased by increasing the width and the height of washing tub 11.

[0043] Left and right side walls 10a of housing 10 configuring the outer contour of dishwasher 50 are formed by performing the bending work on the thin rolled steel plate. Side wall 10a requires the strength to respond to an increase in weight by the amount of increase in the capacity of dishes and the amount of washing water required to ensure the washing performance of increased dishes 3 by way of slide mechanism 12.

15 [0044] In dishwasher 50, rail attachment member 13, which cross-section is formed to a substantially horseshoe shape, is attached to side wall 10a, so that rail attachment member 13 and side wall 10a of housing 10 form a rectangular or a box shaped cross-section. Only the portion necessary for supporting washing tub 11 of increased weight thus can be reinforced. Thus, the strength with respect to the load can be enhanced without increasing the cost such as increasing the thickness of the rolled steel plate, which is the material.

20 [0045] In this case, slide mechanism 12 is positioned on the inner side with respect to side wall 10a due to the presence of rail attachment member 13. However, washing tub 11 has left and right side wall portions 16c of washing tub member 16 raised upward from the outermost periphery of seal unit 21. Thus, the internal capacity on the upper side of seal unit 21 can be enlarged and washing basket 22 can be arranged therein, whereby the capacity of dishes 3 to be accommodated can be increased.

25 [0046] Furthermore, deep press working corresponding to the width of rail attachment member 13 does not need to be forcedly performed on side wall 10a of housing 10, and hence distortions and breakage do not occur in molding. The work thus can be facilitated, and housing 10 having stable shape dimension can be obtained.

[0047] Rail attachment member 13 can be formed through a simple step of merely performing the bending work, and is configured such that the cross-sectional shape is a rectangle or a box shape when attached to side wall 10a of housing
30 10. A structure that can easily ensure strength is thereby realized.

[0048] A side portion of rail attachment member 13 includes rail holding portion 13b that projects out inward while being attached to housing 10, and that supports slide mechanism 12 from the lower side. The load of washing tub 11 accommodating dishes 3 thus can be dispersed to rail holding portion 13b and upper attachment portion 10c and lower attachment portion 10d without being concentrated on upper attachment portion 10c and lower attachment portion 10d
35 of side wall 10a of housing 10 fixed with screw. The configuration of the attachment portion by screw fixation thus can be simplified.

[0049] Rail attachment member supporting portion 10b for determining the attachment height position of rail attachment member 13 and supporting rail attachment member 13 from the lower side is provided in housing 10 so as to project out inward from left and right side walls 10a. The variation in the height positions of left and right slide mechanisms 12 thus reduces, and the movement of washing tub 11 in the front and back direction becomes smooth. Furthermore, the load of washing tub 11 accommodating dishes 3 is supported at the upper end face of rail attachment member supporting portion 10b, thus suppressing the downward deformation of rail attachment member 13. The downward movement of washing tub 11 is thereby suppressed, and the water tightness of the portion that closes opening 11a on the upper side of washing tub 11 with lid body 14 can be ensured.

45 [0050] Since the load of washing tub 11 accommodating dishes 3 can be dispersed to rail attachment member supporting portion 10b and upper attachment portion 10c and lower attachment portion 10d, the configuration of the attachment portion by screw fixation can be simplified.

[0051] Upper attachment portion 10x and lower attachment portion 10d formed to project out inward of left and right side walls 10a of housing 10 have a difference in level in the degree of inward projection. The portion for attaching rail attachment member 13 of side wall 10a of housing 10 thus can be effectively reinforced through simple work intensively and without increasing the cost.

50 [0052] Outward projection 10e that projects out outward than upper attachment portion 10c and lower attachment portion 10d is provided between upper attachment portion 10c and lower attachment portion 10d of left and right side walls 10a of housing 10. The portion that forms a rectangular or a box shaped cross-section with rail attachment member 13 of side wall 10a of housing 10 can be reinforced through simple work intensively and without increasing the cost.

55 [0053] Rail attachment member supporting portion 10b formed on left and right side walls 10a and rail holding portion 13b formed at the lowermost part of step portion 13a of rail attachment member 13 are both provided in plurals in the depth direction of dishwasher 50. However, at least one of rail attachment member supporting portion 10b or rail holding

portion 13b may be formed as one projection that is long in the depth direction. In particular, if rail attachment member supporting portion 10b is formed as one projection that is long in the depth direction, the effect of suppressing the downward deformation of the upper surface of rail attachment member 13 caused by the load of washing tub 11 accommodating dishes 3 can be increased.

5 [0054] Furthermore, dishwasher 50 is configured by dividing washing tub 11 into washing tub member 16 and bottom portion configuring member 17. Furthermore, bottom portion configuring member 17 is formed as a unit with a large part of the electrical components and mechanism components mounted thereon. The washing tub of different capacities can be obtained even if single bottom portion configuring member 17 is used by making the portion on the upper side of seal unit 21 of washing tub member 16 larger or smaller. Therefore, the production of dishwasher 50 having different washing tub capacity can be easily responded, and the manufacturing efficiency can be enhanced.

10 [0055] Further characteristics of dishwasher 50 according to the present exemplary embodiment will now be described in comparison with another dishwasher 51 that uses same bottom portion configuring member 17.

15 [0056] FIG. 4 is a side view showing an internal configuration of another dishwasher 51 using same bottom portion configuring member 17 according to the exemplary embodiment of the present invention, and FIG. 5 is a front view showing the main parts of the internal configuration of another dishwasher 51. The same reference numerals are denoted on the configurations same as dishwasher 50 such as bottom portion configuring member 17, and the description thereof will be omitted.

20 [0057] As shown in FIG. 4, dishwasher 51 is of a shallow type in which the depth of the washing tub is shallower than dishwasher 50 described above, and drawer 25 for accommodating kitchen goods, and the like is provided in a kitchen unit space below dishwasher 51. Such a shallow type dishwasher 51 and a deep type dishwasher 50 in which the depth of the washing tub is deep, described above, are prepared so that the user can select the preferred one when planning the kitchen unit, thus improving the convenience of the kitchen unit.

25 [0058] Deep type dishwasher 50 appeals in that the amount of dishes 3 that can be accommodated in washing tub 11 is large. Thus, compared to shallow type dishwasher 51, not only is the depth deep, but the width dimension also needs to be as wide as possible. A width dimension of housing 10 and a width dimension of washing tub 11 are both set to be wider than those in shallow type dishwasher 51.

30 [0059] Specifically, as shown in FIG. 3, dishwasher 50 has left and right side wall portions 16c of washing tub member 16 raised upward from the outermost periphery of seal unit 21 so that the width dimension of washing tub 11 becomes as large as possible. The internal capacity of washing tub 11 is thus made large to a maximum extent. At the time of use, opening 11a through which dishes 3 are put in or taken out at the uppermost part of washing tub member 16 needs to be closed with lid body 14.

35 [0060] In this case, the convenience in putting in or taking out dishes 3 and the workability of resin molding of washing tub member 16 need to be realized. Therefore, in dishwasher 50, flange portion 16f needs to be provided so as to bulge out to the outer side of side wall portion 16c at a portion where lid body 14 makes contacts and closes through seal member 23 (see FIG. 2).

[0061] In other words, when commonly using bottom portion configuring member 17 in deep type dishwasher 50, a configuration for attaching fixed rail portion 12a of slide mechanism 12 to side wall 10a of housing 10 while ensuring the width dimension for flange portion 16f is required.

40 [0062] As shown in FIG. 5, in the case of shallow type dishwasher 51, washing tub member 40, which configures washing tub 29 by joining with bottom portion configuring member 17, has left and right side wall portions 40a raised upward from the innermost periphery of seal unit 54. The width dimension for the flange portion bulging out at the periphery of the opening at the uppermost part of washing tub member 40 thus can be ensured. Thus, fixed rail portion 12a of slide mechanism 12 can be directly attached to side wall 27a of housing 27. The configuration of seal unit 54 including groove portion 17b, seal rib 40b, and seal member 18 is similar to seal unit 21 of the deep type dishwasher described above.

45 [0063] Rail attachment member 13 intensively reinforces the necessary portion of left and right side walls 10a having high height in deep type dishwasher 50. Furthermore, rail attachment member 13 exhibits a large effect as a configuration for attaching fixed rail portion 12a of slide mechanism 12 to side wall 10a of housing 10 while ensuring the width dimension for flange portion 16f when commonly using bottom portion configuring member 17 with shallow type dishwasher 51.

50 INDUSTRIAL APPLICABILITY

[0064] Therefore, according to the present invention, the housing structure that reinforces only the portion necessary for the housing of the dishwasher to be enlarged, and facilitates the work while ensuring strength without increasing the cost can be realized. It is thus useful as a built-in type dishwasher or the like in which the washing tub is pulled out to put in or take out the dishes.

REFERENCE MARKS IN THE DRAWINGS

[0065]

5	3	dishes
	10, 27	housing
	10a, 27a	side wall
	10b	rail attachment member supporting portion
10	10c	upper attachment portion
	10d	lower attachment portion
	10e	outward projection
	10f	bottom surface
	11, 29	washing tub
15	11a	opening
	12	slide mechanism
	12a	fixed rail portion
	12b	movable rail portion
20	13	rail attachment member
	13a	step portion
	13b	rail holding portion
	13c	upper flange portion
	13d	lower flange portion
25	14	lid body
	15	link mechanism
	16, 40	washing tub member
	16a	outer peripheral lower end
30	16b, 40b	seal rib
	16c, 40a	side wall portion
	16d	engagement portion
	16e	engagement hole
	16f	flange portion
35	17	bottom portion configuring member
	17a	outer peripheral upper end
	17b	groove portion
	17c	projection
40	18, 23	seal member
	19	washing nozzle
	20	washing pump
	21, 54	seal unit
	22	washing basket
45	25	drawer
	30	rolling body
	50, 51	dishwasher

50 **Claims**

1. A dishwasher comprising:

55 a washing tub arranged in a housing that opens to a front side and for accommodating dishes to be washed;
a slide mechanism attached on both sides of the washing tub and for supporting the washing tub so as to be
movable in a front and back direction; and
a rail attachment member for fixing the slide mechanism and the housing,
wherein

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a cross-sectional shape formed by the rail attachment member and the side walls of the housing is a rectangle or a box shape when the rail attachment member is attached to the housing.

- 5 **2.** The dishwasher according to claim 1, wherein
the rail attachment member has a substantially horseshoe shaped (Π in Greek letter) cross-section, and includes
a rail holding portion that projects out inward when attached to the housing and that supports the slide mechanism
from a lower side at a side portion.
- 10 **3.** The dishwasher according to claim 1, wherein
the housing includes a rail attachment member supporting portion for determining an attachment height position of
the rail attachment member and supporting the rail attachment member from a lower side, and
the rail attachment member supporting portion is arranged to project out inward from left and right side walls.
- 15 **4.** The dishwasher according to claim 1, wherein
an upper attachment portion and a lower attachment portion for attaching the rail attachment member formed to
project out inward are arranged on left and right side walls of the housing, and
the upper attachment portion and the lower attachment portion have a difference in level in a degree of inward
projection.
- 20 **5.** The dishwasher according to claim 4, wherein
an outward projection that projects out outward than the upper attachment portion and the lower attachment portion
is arranged between the upper attachment portion and the lower attachment portion of the left and right side walls
of the housing.
- 25 **6.** The dishwasher according to any one of claims 1 to 5, wherein
the washing tub includes a bottom portion configuring member that configures at least a bottom portion of the
washing tub, and a washing tub member that configures at least a side surface of the washing tub, and
the slide mechanism is attached to the bottom portion configuring member.

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FIG. 1

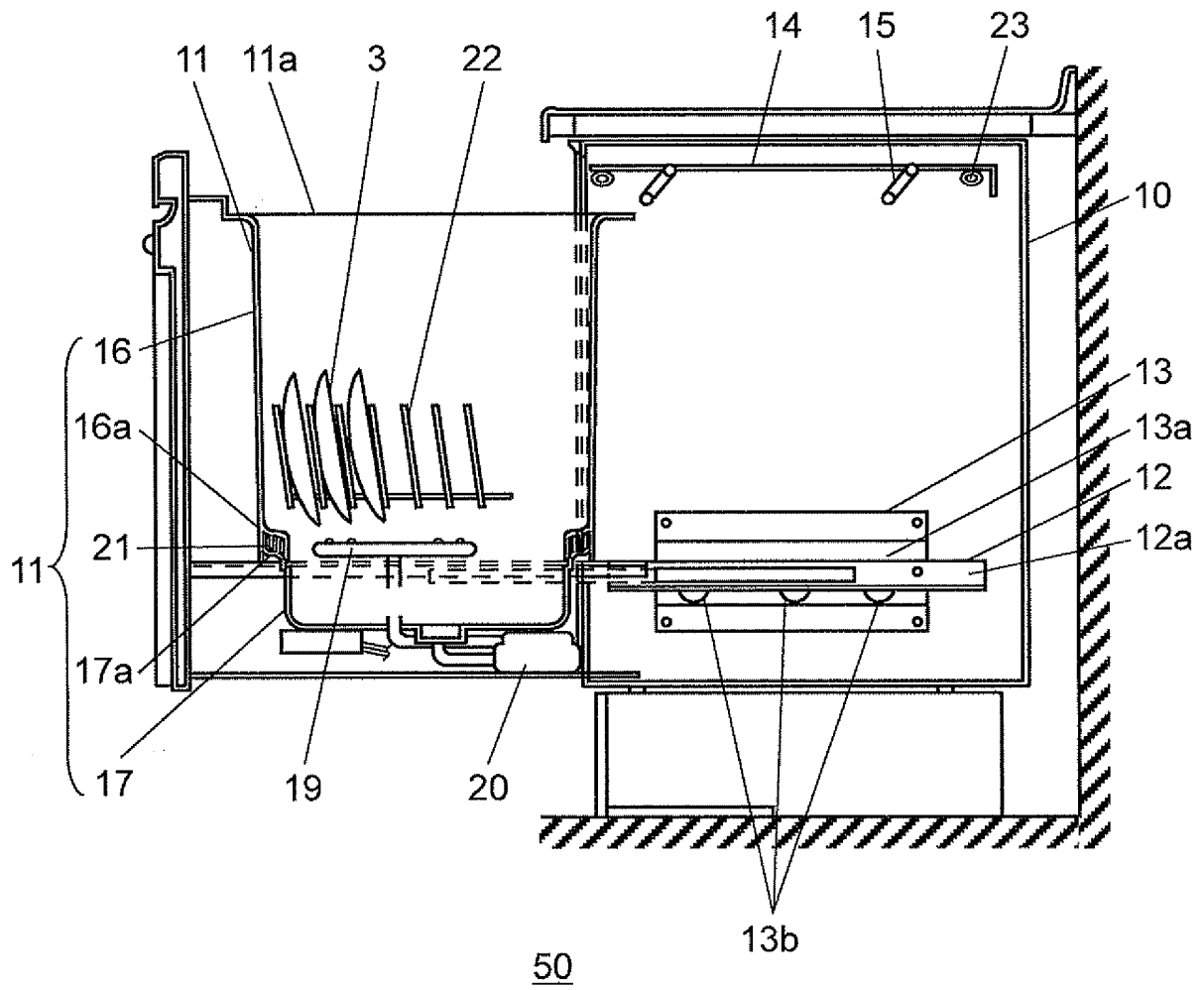
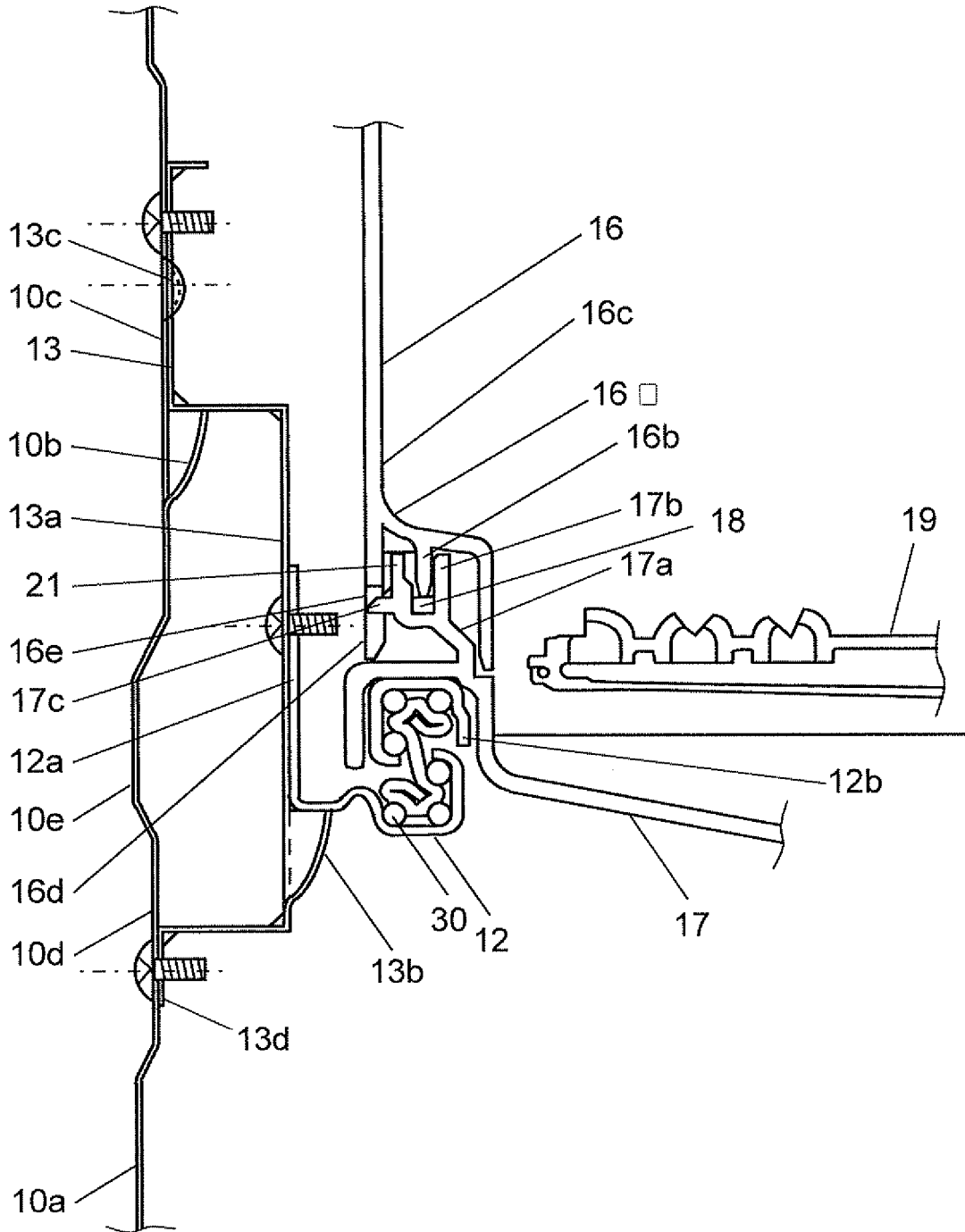


FIG. 3



□

FIG. 4

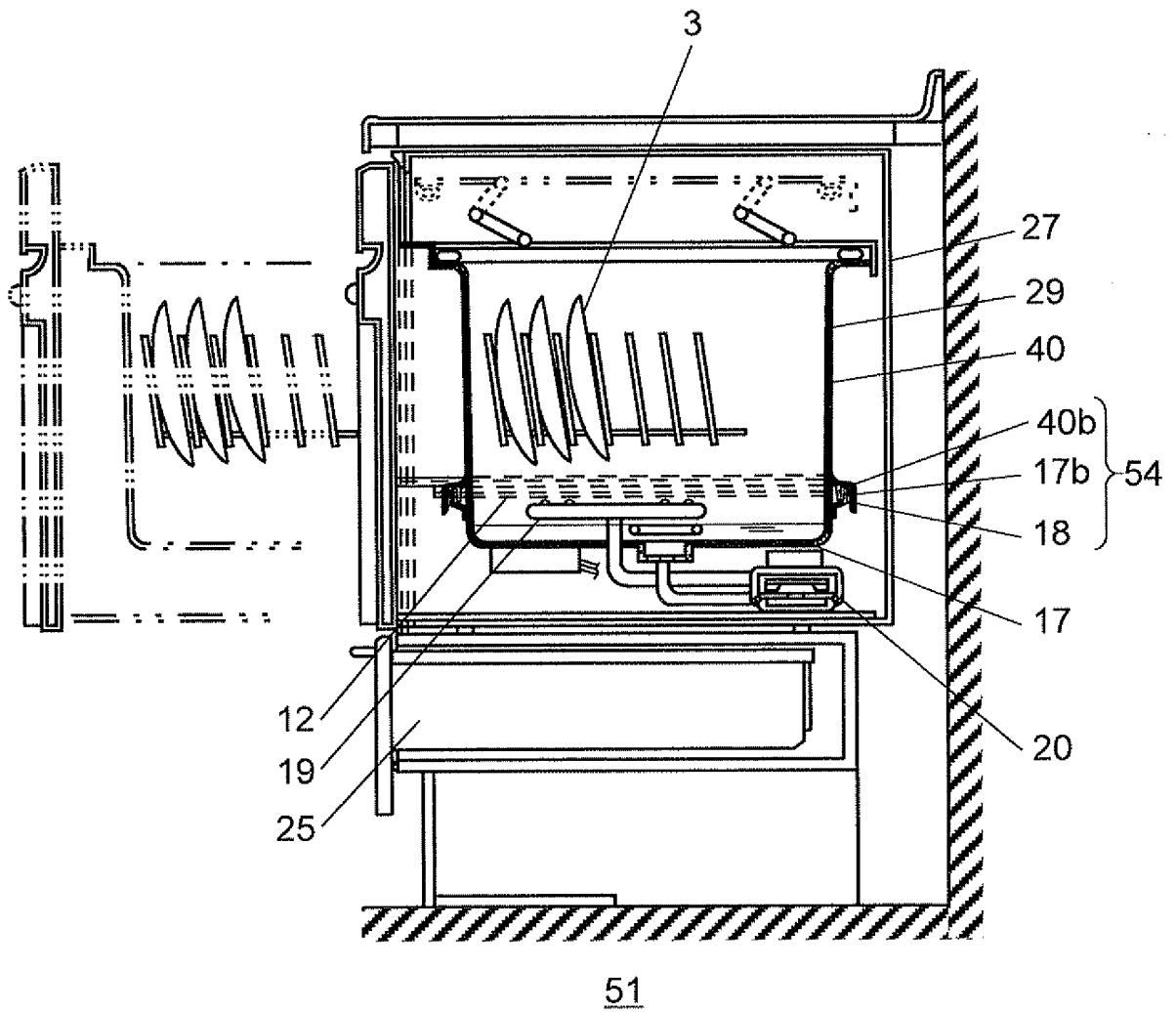


FIG. 5

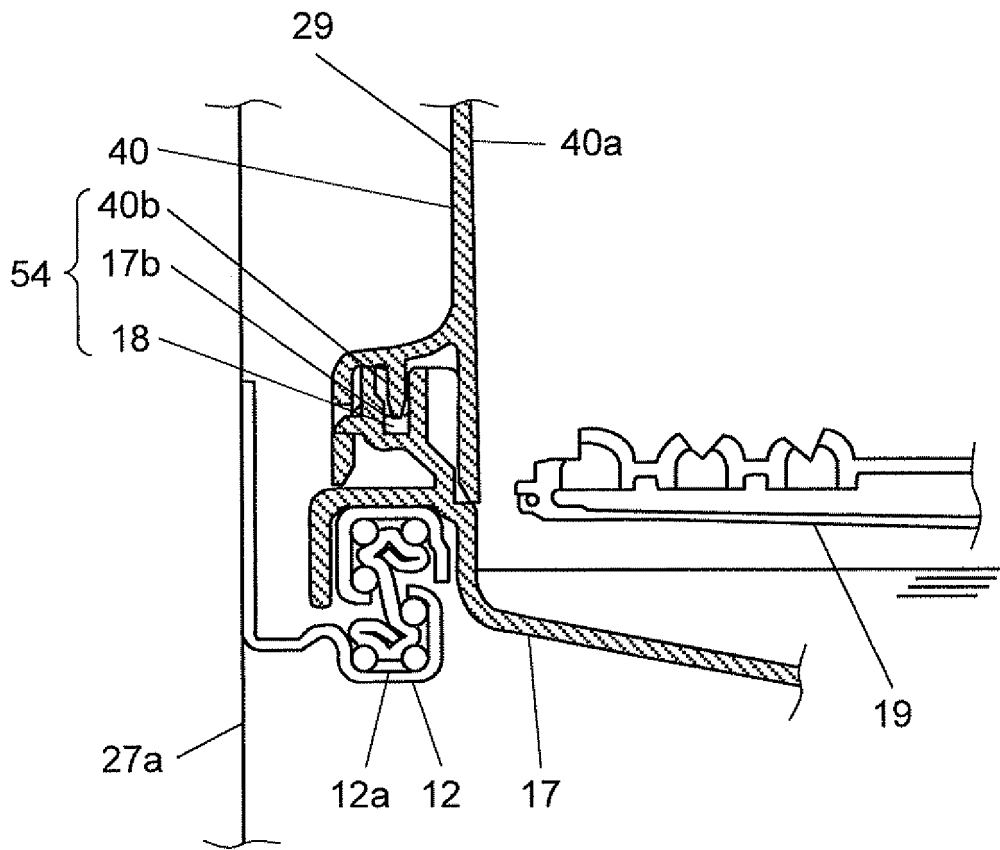


FIG. 6

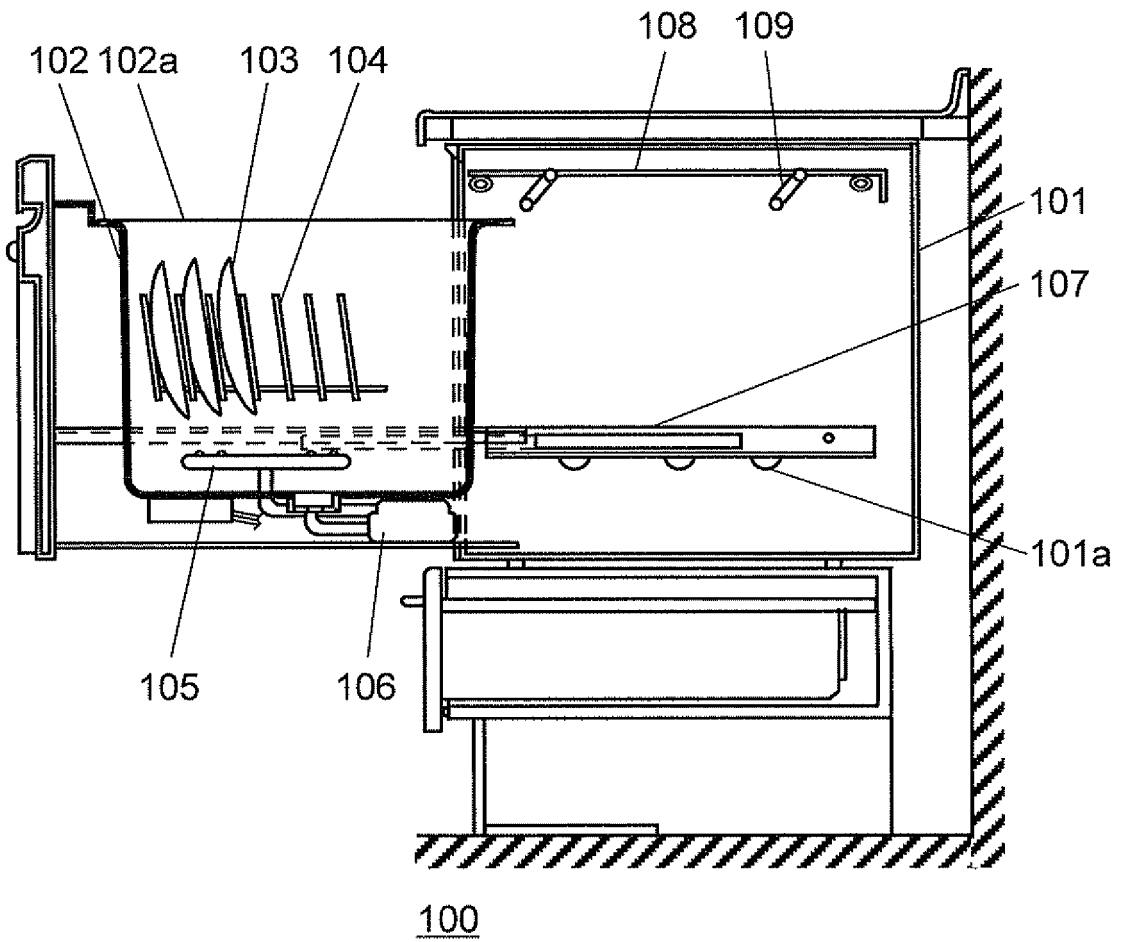
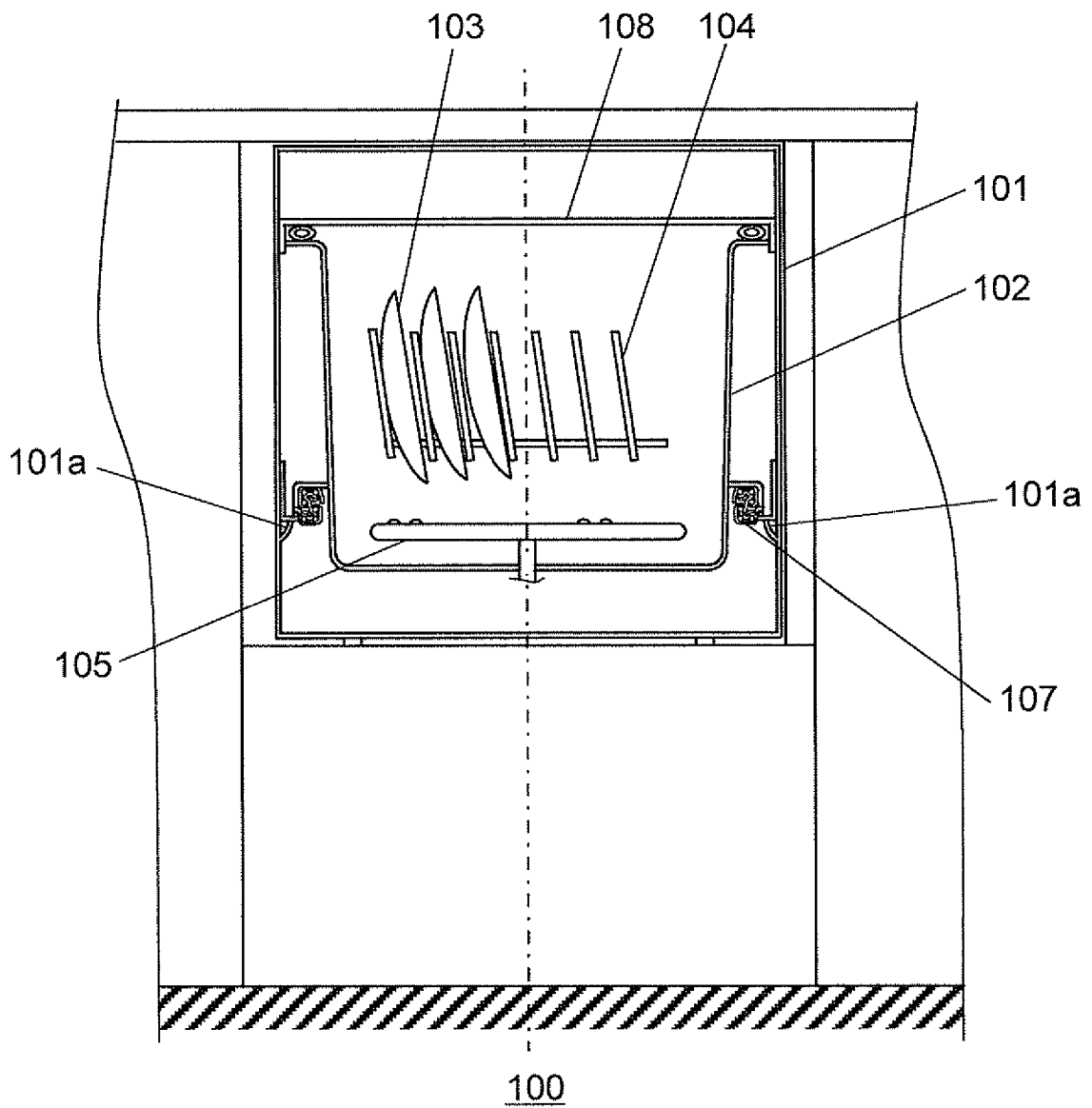


FIG. 7



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2011/003665

A. CLASSIFICATION OF SUBJECT MATTER A47L15/42(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) A47L15/42		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Jitsuyo Shinan Koho 1922-1996 Jitsuyo Shinan Toroku Koho 1996-2011 Kokai Jitsuyo Shinan Koho 1971-2011 Toroku Jitsuyo Shinan Koho 1994-2011		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2004-154223 A (Matsushita Electric Industrial Co., Ltd.), 03 June 2004 (03.06.2004), paragraphs [0017], [0018]; fig. 7 & CN 1498591 A & CN 2662826 Y	1-6
A	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 171549/1980 (Laid-open No. 91711/1982) (Sanyo Electric Co., Ltd., Tokyo Sanyo Electric Co., Ltd.), 05 June 1982 (05.06.1982), page 1, line 17 to page 2, line 3; page 3, lines 4 to 17 (Family: none)	1-6
<input type="checkbox"/> Further documents are listed in the continuation of Box C.		<input type="checkbox"/> See patent family annex.
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Date of the actual completion of the international search 05 September, 2011 (05.09.11)	Date of mailing of the international search report 20 September, 2011 (20.09.11)	
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Patent documents cited in the description

- JP 2004154223 A [0010]