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(54) **WASHING MACHINE WITH DRAWER-TYPE CHARGING DEVICE**

WASCHMASCHINE MIT SCHUBLADENARTIGER LADEVORRICHTUNG

LAVE-LINGE COMPORTANT UN DISPOSITIF DE CHARGE DE TYPE TIROIR

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Description

[0001] The invention relates to a drawer-type charging device of a washing machine, and in particular, to a connection structure between the device and a panel of the washing machine.

[0002] Patent KR 101 405 286 B1 discloses a washing machine.

[0003] A washing machine often has a charging device, and treatment agents such as a detergent, a softener, a disinfectant, a bleaching agent, and the like are added by using the device in a washing process. A relatively common manner of setting the charging device is to set it on a panel of the washing machine in a drawer-type way. A cover portion of the charging device is matched with the panel of the washing machine.

[0004] A gap between the cover portion and the panel is a factor affecting an appearance effect. An oversized gap may appear to have poor product quality and reduce user satisfaction. Usually, a reasonable gap value is set by calculating during product design. However, it is found that the gap is quite difficult to control and meet a tolerance requirement after mass production of products. In addition, after a long time of use, the gap may become larger and uneven, especially an upper gap 1a (as shown in FIG. 1), and a lateral gap 1b may also become larger. The reason is that a positioning system of the cover portion and the panel is unreasonable in design or the positioning fails. There are mainly two types of positioning systems for the charging device of the washing machine on the market:

[0005] In the first type, no constraint relationship exists between the cover portion and the panel. A cover portion material has a large shrinkage rate and a large deformation, which results in a large dimension fluctuation range, and it is quite difficult to control the gap. No constraint exists between the cover portion and the panel, and no positioning relationship exists between the two. Consequently, the gap is out of control.

[0006] In the second type, a constraint force in a depth direction of the washing machine exists between the cover portion and the panel. This solution is logically reasonable, but still has the following problems:

a. An unconstrained degree of freedom still exists in the cover portion. For example, under a gravity action of the charging device, the cover portion rotates around an axis along a width direction of the washing machine. Consequently, the gap is out of control, and especially, the upper gap is greater than expected in design.

b. A constraint mechanism is designed at a position that customers can see after the charging device is pulled out. After a long time of use, due to friction and wear, a paint loss phenomenon occurs at the panel and the charging device, and an original color of a material is revealed, thereby affecting the ap-

pearance effect and also increasing the gap.

[0007] An objective of the invention is to overcome disadvantages in the prior art.

[0008] The invention achieves the objective by using the following implementations.

[0009] A washing machine with a drawer-type charging device includes a panel that forms a part of a box body, where the panel is provided with a window portion, the charging device penetrates through the window portion and is provided with a cover portion, and the cover portion of the charging device is matched with the window portion of the panel when the charging device completely stretches into the box body. The window portion is provided with a first supporting surface and a second supporting surface that extend and are spaced relative to a width direction of the washing machine, and the cover portion is provided with a first bulge and a second bulge that are respectively supported on the first supporting surface and the second supporting surface from above, where the first bulge and the second bulge are curved structures and in point contact with the first supporting surface and the second supporting surface respectively, and the first supporting surface and the second supporting surface respectively apply a vertical upward supporting force to the first bulge and the second bulge. In this way, the cover portion is vertically supported by the first supporting surface and the second supporting surface without displacement in a gravity direction, to ensure that a gap between the cover portion and an upper part of the panel does not increase. In addition, supporting points are set at intervals along the width direction of the washing machine, and the cover portion does not rotate around an axis of a depth direction. Therefore, gaps at left and right sides are also maintained.

[0010] The first bulge and the second bulge are each a hemispherical structure.

[0011] The first bulge and the second bulge are respectively disposed at bottom parts of a first positioning pin and a second positioning pin.

[0012] The window portion is provided with a first positioning groove and a second positioning groove that have openings at front parts, the first supporting surface and the second supporting surface are respectively located at bottom parts of the first positioning groove and the second positioning groove, a top part of the first positioning groove is further provided with a third positioning surface, a top part of the second positioning groove is further provided with a fourth positioning surface, and top parts of the first positioning pin and the second positioning pin are respectively provided with a third bulge and a fourth bulge. When the cover portion is matched with the panel, the first positioning pin and the second positioning pin respectively stretch into the first positioning groove and the second positioning groove, the third bulge is in point contact with the third positioning surface, and the fourth bulge is in point contact with the fourth positioning surface. By such a structure, both the top and the

bottom of the window portion in a vertical direction are positioned, to make the matching more stable.

[0013] The window portion is provided with a first positioning groove and a second positioning groove that have openings at front parts, the first supporting surface and the second supporting surface are respectively located at bottom parts of the first positioning groove and the second positioning groove, and the first positioning pin and the second positioning pin are respectively provided with bulges at left and right sides defined along the width direction of the washing machine. When the cover portion is matched with the panel, the first positioning pin and the second positioning pin respectively stretch into the first positioning groove and the second positioning groove, and the bulges at the left and right sides are respectively in point contact with left and right side faces of the first positioning groove and the second positioning groove. In this way, movement of left and right sides of the cover portion is constrained, thereby ensuring stability and controllability of the gap. On the basis of this, the gap may be designed as small as possible.

[0014] The first positioning pin and the second positioning pin are located at a lower part of the cover portion. Therefore, the first positioning pin and the second positioning pin are shielded by the charging device, and are generally not easily observed by a user when opening the charging device, to improve impressions and experience of the user.

[0015] As another implementation scheme, or additionally, the cover portion is provided with a third positioning pin, the window portion is provided with a third positioning groove containing the third positioning pin, left and right sides of the third positioning pin are respectively provided with a fifth bulge and a sixth bulge, and left and right sides in the third positioning groove are respectively provided with a fifth positioning surface and a sixth positioning surface. When the cover portion is matched with the panel, the third positioning pin stretches into the third positioning groove, and the fifth bulge and the sixth bulge are respectively in point contact with the fifth positioning surface and the sixth positioning surface. By a mechanism feature of the implementation scheme, the movement of the left and right sides of the cover portion is also constrained.

[0016] The third positioning pin is located at the lower part of the cover portion.

[0017] The window portion is provided with a seventh positioning surface facing the front of the depth direction of the washing machine, the cover portion is provided with a plurality of seventh bulges, and when the cover portion is matched with the window portion, the seventh bulges are in point contact with the seventh positioning surface.

[0018] In addition, the cover portion is provided with a plurality of hooks that extend along the depth direction of the washing machine, and the window portion is provided with a plurality of locking bulges matched with the hooks.

[0019] The following describes specific implementations of the invention with reference to the accompanying drawings.

5 FIG. 1 is a top view of a cover portion of a charging device and a panel of a usual washing machine;

FIG. 2 is a schematic front view of a washing machine;

10 FIG. 3 is a schematic lateral view of a charging device and a panel that are in an open state;

15 FIG. 4 is a schematic lateral view of a cover portion of a charging device and a panel that are in a matching state;

20 FIG. 5 is a local structural diagram of a panel, which mainly displays a structure of a window portion;

FIG. 6 is a schematic structural diagram of a back part of a cover portion of a charging device;

25 FIG. 7 is a local enlarged diagram of the cover portion of the charging device in FIG. 6; and

FIG. 8 is a local schematic diagram of a cover portion and a panel that are in a matching state.

30 **[0020]** As shown in FIG. 2, a washing machine 100 is provided with a box body 2. A charging device 10 designed as a drawer-type structure is disposed on the box body 2 in a drawer-type way. In a matching state, a cover portion 11 of the charging device 10 is flush with the box body 2. The box body 2 includes a panel 4 located at a front side of the washing machine. The charging device 10 is disposed on the panel 4. The panel 4 of the washing machine shown in FIG. 2 includes a control piece 5 and is separate from a front panel 6 located below the panel 4. In other embodiments, the panel may alternatively integrally extend to a bottom part of the box body 2.

35 **[0021]** As shown in FIG. 3, the charging device 10 includes the cover portion 11 and a treatment agent placing portion 12. The cover portion 11 is fixedly connected to the treatment agent placing portion 12. The treatment agent placing portion 12 penetrates through a window portion 41 of the panel 4 and may move along a depth direction Y of the washing machine. When the treatment agent placing portion 12 completely stretches into the panel 4, the cover portion 11 is matched with the window portion 41.

40 **[0022]** As shown in FIG. 4 to FIG. 8, the window portion 41 of the panel 4 is provided with four groups of locking bulges 42, which are respectively matched with four hooks 13 that extend along the depth direction Y of the washing machine and that are on the cover portion 11. A lower part of the window portion 41 is provided with a first positioning groove 43a, a second positioning groove

43b, and a third positioning groove 43c that have openings at front parts, which respectively contain, along the depth direction Y of the washing machine, a first positioning pin 14a, a second positioning pin 14b, and a third positioning pin 14c disposed at a lower part of the cover portion 11. In this way, the cover portion 11 is basically connected to the window portion 41 of the panel 4. However, further positioning is still required to ensure a stable connection between the cover portion 11 and the panel 4.

[0023] When a position relationship between two parts is determined, fixing one part needs to constrain 6 degrees of freedom of the one part, and constraining 6 degrees of freedom of the other part is an essence of the positioning system design. In the design of the charging device and the panel, the panel is fixed by default. How to constrain degrees of freedom of the charging device, especially the cover portion, is a main direction of the design. In the product design, a "3-2-1 principle" about the positioning system in geometric dimension and tolerance is followed to constrain 6 degrees of freedom of a part. The principle is as follows: It is assumed that 3 mutually perpendicular planes in the space form a datum coordinate system, and are a first datum plane, a second datum plane, and a third datum plane; when a part is fixed in the coordinate system, the following selection needs to be performed in order: at least three points on the part are selected to be in contact with the first datum plane (constraining 3 degrees of freedom), at least two points on the part are selected to be in contact with the second datum plane (constraining 2 degrees of freedom), and at least one point on the part is selected to be in contact with the third datum plane (constraining one degree of freedom). Therefore, the 6 degrees of freedom of the part are all constrained.

[0024] As shown in FIG. 5, the window portion 41 is provided with a first supporting surface 44a and a second supporting surface 44b that extend and are spaced relative to a width direction X of the washing machine. The first supporting surface 44a and the second supporting surface 44b are coplanar, and preferably may be on a horizontal plane. The first supporting surface 44a is located at a bottom part of the first positioning groove 43a, and the second supporting surface 44b is located at a bottom part of the second positioning groove 43b. A top part of the first positioning groove 43a is further provided with a third positioning surface 44c, and a top part of the second positioning groove 43b is further provided with a fourth positioning surface 44d. Bottom parts of the first positioning pin 14a and the second positioning pin 14b are respectively provided with a first bulge 15a and a second bulge 15b that are hemispherical structures. After the cover portion 11 is matched with the window portion 41 of the panel 4, the first bulge 15a and the second bulge 15b are respectively supported on the first supporting surface 44a and the second supporting surface 44b without gap from above, and are respectively in point contact with the first supporting surface 44a and the second supporting surface 44b. The first supporting surface 44a and

the second supporting surface 44b respectively apply a vertical upward supporting force to the first bulge 15a and the second bulge 15b. Top parts of the first positioning pin 14a and the second positioning pin 14b are respectively provided with a third bulge 15c and a fourth bulge 15d. When the cover portion 11 is matched with the panel 4, the third bulge 15c is in point contact with the third positioning surface 44c, and the fourth bulge 15d is in point contact with the fourth positioning surface 44d. In this way, two degrees of freedom of the cover portion 11 moving along a height direction Z of the washing machine and rotating around the depth direction Y of the washing machine are constrained.

[0025] Compared with usual gap matching, the first bulge 15a and the second bulge 15b are respectively supported on the first supporting surface 44a and the second supporting surface 44b without gap from above. A problem of a larger gap caused due to gravity is resolved. In addition, each matching form is point matching, rather than face matching. In this way, a product size is better managed and accuracy is higher. Therefore, the gap is easier to control.

[0026] As shown in FIG. 5, the cover portion 11 is provided with a third positioning pin 14c, and the window portion 41 is provided with a third positioning groove 43c containing the third positioning pin 14c. Left and right sides of the third positioning pin 14c are respectively provided with a fifth bulge 15e and a sixth bulge 15f. Left and right sides in the third positioning groove 43c are respectively provided with a fifth positioning surface 44e and a sixth positioning surface 44f. When the cover portion 11 is matched with the panel 4, the third positioning pin 14c stretches into the third positioning groove 43c, and the fifth bulge 15e and the sixth bulge 15f are respectively in point contact with the fifth positioning surface 44e and the sixth positioning surface 44f. The fifth bulge 15e and the sixth bulge 15f are curved structures, for example, may be spherical structures. In this way, a degree of freedom of the cover portion 11 moving along the width direction X of the washing machine is constrained.

[0027] In other optional implementations, the first positioning pin 14a and the second positioning pin 14b are respectively provided with bulges (not shown in the accompanying drawing) at left and right sides defined along the width direction of the washing machine. When the cover portion 11 is matched with the panel 4, the first positioning pin 14a and the second positioning pin 14b respectively stretch into the first positioning groove 43a and the second positioning groove 43b, and the bulges at the left and right sides are respectively in point contact with left and right side faces of the first positioning groove 43a and the second positioning groove 43b.

[0028] As shown in FIG. 5, the window portion 41 is provided with a seventh positioning surface 44g facing the front of the depth direction Y of the washing machine. The cover portion 11 is provided with a plurality of fourth positioning pins 14d, and a front end of each fourth po-

sitioning pin 14d is provided with a seventh bulge 15g. When the cover portion 11 is matched with the window portion 41, the seventh bulge 15g is in point contact with the seventh positioning surface 44g. With matching between the locking bulges 42 and the hooks 13, three degrees of freedom of moving along the depth direction Y of the washing machine, rotating around the width direction X, and rotating around the height direction Z are constrained. The seventh bulge 15g is a curved structure, for example, may be a spherical structure.

[0029] In this way, after assembly, sixth degrees of freedom of the charging device 10 are all constrained, and the charging device 10 is fixed relative to the position of the panel 4. Specific embodiments described above and shown in the accompanying drawings are only used to illustrate the invention, but not all of the invention. Within the scope of the appended claims, any form of modification made by a person of ordinary skill in the related art to the invention is within the protection scope of the invention.

Claims

1. A washing machine with a drawer-type charging device, comprising a panel (4) that forms a part of a box body (2), wherein the panel is provided with a window portion (41), the charging device (10) penetrates through the window portion and is provided with a cover portion (11), and when the charging device completely stretches into the box body, the cover portion of the charging device is matched with the window portion of the panel, wherein the window portion is provided with a first supporting surface (44a) and a second supporting surface (44b) that extend and are spaced relative to a width direction (X) of the washing machine, and the cover portion is provided with a first bulge (15a) and a second bulge (15b) that are respectively supported on the first supporting surface and the second supporting surface from above, wherein the first bulge and the second bulge are curved structures and in point contact with the first supporting surface and the second supporting surface respectively, and the first supporting surface and the second supporting surface respectively apply a vertical upward supporting force to the first bulge and the second bulge, **characterized in that** the first bulge and the second bulge are respectively disposed at bottom parts of a first positioning pin (14a) and a second positioning pin (14b), wherein the window portion is provided with a first positioning groove (43a) and a second positioning groove (43b) that have openings at front parts, the first supporting surface and the second supporting surface are respectively located at bottom parts of the first positioning groove and the second positioning groove, a top part of the first positioning groove is further provided with a third positioning surface (44c), a top part

of the second positioning groove is further provided with a fourth positioning surface (44d), and top parts of the first positioning pin and the second positioning pin are respectively provided with a third bulge and a fourth bulge; and when the cover portion is matched with the panel, the first positioning pin and the second positioning pin respectively stretch into the first positioning groove and the second positioning groove, the third bulge (15c) is in point contact with the third positioning surface (44c), and the fourth bulge (15d) is in point contact with the fourth positioning surface (44d).

2. The washing machine according to claim 1, **characterized in that** the first bulge (15A) and the second bulge (15B) are each a hemispherical structure.
3. The washing machine according to claim 1, **characterized in that** the window portion (41) is provided with a first positioning groove (43A) and a second positioning groove (43B) that have openings at front parts, the first supporting surface (44A) and the second supporting surface (44B) are respectively located at bottom parts of the first positioning groove (43A) and the second positioning groove (43B), and the first positioning pin (14A) and the second positioning pin (14B) are respectively provided with bulges at left and right sides defined along the width direction of the washing machine; and when the cover portion (11) is matched with the panel (4), the first positioning pin (14A) and the second positioning pin (14B) respectively stretch into the first positioning groove (43A) and the second positioning groove (43B), and the bulges at the left and right sides are respectively in point contact with left and right side faces of the first positioning groove (43A) and the second positioning groove (43B).
4. The washing machine according to claim 1, **characterized in that** the first positioning pin (14A) and the second positioning pin (14B) are located at a lower part of the cover portion (11).
5. The washing machine according to claim 1, **characterized in that** the cover portion is provided with a third positioning pin (14c), the window portion is provided with a third positioning groove (43c) containing the third positioning pin, left and right sides of the third positioning pin are respectively provided with a fifth bulge (15e) and a sixth bulge (15f), and left and right sides in the third positioning groove are respectively provided with a fifth positioning surface (44e) and a sixth positioning surface (44f); and when the cover portion is matched with the panel, the third positioning pin stretches into the third positioning groove, and the fifth bulge and the sixth bulge are respectively in point contact with the fifth positioning surface and the sixth positioning surface.

6. The washing machine according to claim 1, **characterized in that** the window portion is provided with a seventh positioning surface (44g) facing the front of a depth direction of the washing machine, the cover portion is provided with a plurality of seventh bulges (15g), and when the cover portion is matched with the window portion, the seventh bulges are in point contact with the seventh positioning surface.
7. The washing machine according to claim 6, **characterized in that** the cover portion is provided with a plurality of hooks (13) that extend along the depth direction (Y) of the washing machine, and the window portion is provided with a plurality of locking bulges (42) matched with the hooks.
8. The washing machine according to claim, **characterized in that** the first supporting surface (44A) and the second supporting surface (44B) extend horizontally and are coplanar.

Patentansprüche

1. Waschmaschine mit einer schubladenartigen Befüllvorrichtung mit einer Blende (4), die Bestandteil eines kastenförmigen Hauptteils (2) ist, wobei die Blende mit einem Fensterabschnitt (41) versehen ist, die Befüllvorrichtung (10) durch den Fensterabschnitt hindurch verläuft und mit einem Abdeckabschnitt (11) versehen ist und der Abdeckabschnitt der Befüllvorrichtung auf den Fensterabschnitt der Blende aufgepasst ist, wenn sich die Befüllvorrichtung vollständig in den kastenförmigen Hauptteil hinein erstreckt, wobei der Fensterabschnitt mit einer ersten Auflagefläche (44a) und einer zweiten Auflagefläche (44b) versehen ist, die in einer Breitenrichtung (X) der Waschmaschine verlaufen und beabstandet sind, und der Abdeckabschnitt mit einem ersten Vorsprung (15a) beziehungsweise einem zweiten Vorsprung (15b) versehen ist, der von oben auf der ersten beziehungsweise der zweiten Auflagefläche aufliegt, wobei es sich bei dem ersten und dem zweiten Vorsprung um eine gekrümmte Konstruktion handelt, die sich mit der ersten beziehungsweise der zweiten Auflagefläche in Punktkontakt befindet, und die erste beziehungsweise die zweite Auflagefläche an dem ersten beziehungsweise dem zweiten Vorsprung eine vertikal nach oben gerichtete Stützkraft ausübt, **dadurch gekennzeichnet, dass** der erste beziehungsweise der zweite Vorsprung an einem unteren Teil eines ersten Positionierstifts (14a) beziehungsweise eines zweiten Positionierstifts (14b) angeordnet ist, wobei der Fensterabschnitt mit einer ersten Positioniernut (43a) und einer zweiten Positioniernut (43b) versehen ist, die am vorderen Teil eine Öffnung aufweisen, wobei die erste beziehungsweise die zweite Auflagefläche an

einem unteren Teil der ersten beziehungsweise der zweiten Positioniernut liegt, ein oberer Teil der ersten Positioniernut ferner mit einer dritten Positionierfläche (44c), ein oberer Teil der zweiten Positioniernut ferner mit einer vierten Positionierfläche (44d) und der obere Teil des ersten beziehungsweise des zweiten Positionierstifts mit einem dritten beziehungsweise einem vierten Vorsprung versehen ist und sich der erste beziehungsweise der zweite Positionierstift, wenn der Abdeckabschnitt auf die Blende aufgepasst ist, in die erste beziehungsweise die zweite Positioniernut hinein erstreckt, sich der dritte Vorsprung (15c) mit der dritten Positionierfläche (44c) und der vierte Vorsprung (15d) mit der vierten Positionierfläche (44d) in Punktkontakt befindet.

2. Waschmaschine nach Anspruch 1, **dadurch gekennzeichnet, dass** es sich bei dem ersten Vorsprung (15A) und dem zweiten Vorsprung (15B) jeweils um eine halbkugelförmige Konstruktion handelt.
3. Waschmaschine nach Anspruch 1, **dadurch gekennzeichnet, dass** der Fensterabschnitt (41) mit einer ersten Positioniernut (43A) und einer zweiten Positioniernut (43B) versehen ist, die am vorderen Teil eine Öffnung aufweisen, wobei die erste Auflagefläche (44A) beziehungsweise die zweite Auflagefläche (44B) an einem unteren Teil der ersten Positioniernut (43A) beziehungsweise der zweiten Positioniernut (43B) liegt und der erste Positionierstift (14A) beziehungsweise der zweite Positionierstift (14B) auf der linken beziehungsweise der rechten Seite mit einem in Breitenrichtung der Waschmaschine definierten Vorsprung versehen ist und sich der erste Positionierstift (14A) beziehungsweise der zweite Positionierstift (14B), wenn der Abdeckabschnitt (11) auf die Blende (4) aufgepasst ist, in die erste Positioniernut (43A) beziehungsweise die zweite Positioniernut (43B) hinein erstreckt und sich der Vorsprung auf der linken beziehungsweise der rechten Seite mit einer linken beziehungsweise einer rechten Seitenfläche der ersten Positioniernut (43A) beziehungsweise der zweiten Positioniernut (43B) in Punktkontakt befindet.
4. Waschmaschine nach Anspruch 1, **dadurch gekennzeichnet, dass** der erste Positionierstift (14A) und der zweite Positionierstift (14B) an einem unteren Teil des Abdeckabschnitts (11) liegen.
5. Waschmaschine nach Anspruch 1, **dadurch gekennzeichnet, dass** der Abdeckabschnitt mit einem dritten Positionierstift (14c) versehen ist, der Fensterabschnitt mit einer dritten Positioniernut (43c) versehen ist, die den dritten Positionierstift enthält, die linke beziehungsweise die rechte Seite des dritten Positionierstifts mit einem fünften Vorsprung (15e)

beziehungsweise einem sechsten Vorsprung (15f) und die linke beziehungsweise die rechte Seite in der dritten Positioniernut mit einer fünften Positionierfläche (44e) beziehungsweise einer sechsten Positionierfläche (44f) versehen ist und sich der dritte Positionierstift, wenn der Abdeckabschnitt auf die Blende aufgepasst ist, in die dritte Positioniernut hinein erstreckt und sich der fünfte beziehungsweise der sechste Vorsprung mit der fünften beziehungsweise der sechsten Positionierfläche in Punktkontakt befindet.

6. Waschmaschine nach Anspruch 1, **dadurch gekennzeichnet, dass** der Fensterabschnitt mit einer siebenten Positionierfläche (44g) versehen ist, die in Tiefenrichtung der Waschmaschine zur Vorderseite hin weist, wobei der Abdeckabschnitt mit mehreren siebenten Vorsprüngen (15g) versehen ist und sich die siebenten Vorsprünge, wenn der Abdeckabschnitt auf den Fensterabschnitt aufgepasst ist, mit der siebenten Positionierfläche in Punktkontakt befinden.
7. Waschmaschine nach Anspruch 6, **dadurch gekennzeichnet, dass** der Abdeckabschnitt mit mehreren Haken (13) versehen ist, die sich in Tiefenrichtung (Y) der Waschmaschine erstrecken, und der Fensterabschnitt mit mehreren Rastvorsprüngen (42) versehen ist, die zu den Haken passen.
8. Waschmaschine nach Anspruch 1, **dadurch gekennzeichnet, dass** sich die erste Auflagefläche (44A) und die zweite Auflagefläche (44B) horizontal erstrecken und koplanar sind.

Revendications

1. Machine à laver comportant un dispositif de chargement de type tiroir, comprenant un panneau (4) qui constitue une partie d'un corps formant caisse (2), dans laquelle le panneau présente une partie en fenêtre (41), le dispositif de chargement (10) pénètre à travers la partie en fenêtre et présente une partie de recouvrement (11), et quand le dispositif de chargement s'étend complètement à l'intérieur du corps formant caisse, la partie de recouvrement du dispositif de chargement s'accorde avec la partie en fenêtre du panneau, dans laquelle la partie en fenêtre présente une première surface de support (44a) et une deuxième surface de support (44b) qui s'étendent et sont écartées par rapport au sens de la largeur (X) de la machine à laver, et la partie de recouvrement présente une première élévation (15a) et une deuxième élévation (15b) qui sont respectivement supportées sur la première surface de support et la deuxième surface de support du dessus, dans laquelle la première élévation et la deuxième éléva-

tion sont des structures incurvées et ont respectivement un point de contact avec la première surface de support et la deuxième surface de support, et la première surface de support et la deuxième surface de support appliquent respectivement une force de support verticale dirigée vers le haut à la première élévation et à la deuxième élévation, **caractérisée en ce que** la première élévation et la deuxième élévation sont respectivement disposées aux parties inférieures d'un premier ergot de positionnement (14a) et d'un deuxième ergot de positionnement (14b), dans laquelle la partie en fenêtre présente un premier passage de positionnement (43a) et un deuxième passage de positionnement (43b) ouverts à l'avant, la première surface de support et la deuxième surface de support sont respectivement situées aux parties inférieures du premier passage de positionnement et du deuxième passage de positionnement, une partie supérieure du premier passage de positionnement présente en outre une troisième surface de positionnement (44c), une partie supérieure du deuxième passage de positionnement présente en outre une quatrième surface de positionnement (44d) et les parties supérieures du premier ergot de positionnement et du deuxième ergot de positionnement présentent respectivement une troisième élévation et une quatrième élévation ; et quand la partie de recouvrement s'accorde avec le panneau, le premier ergot de positionnement et le deuxième ergot de positionnement s'étendent respectivement dans le premier passage de positionnement et le deuxième passage de positionnement, la troisième élévation (15c) a un point de contact avec la troisième surface de positionnement (44c), et la quatrième élévation (15d) a un point de contact avec la quatrième surface de positionnement (44d).

2. Machine à laver selon la revendication 1, **caractérisée en ce que** la première élévation (15A) et la deuxième élévation (15B) sont chacune de structure hémisphérique.
3. Machine à laver selon la revendication 1, **caractérisée en ce que** la partie en fenêtre (41) présente un premier passage de positionnement (43A) et un deuxième passage de positionnement (43B) ouverts à l'avant, la première surface de support (44A) et la deuxième surface de support (44B) sont respectivement situées sur les parties inférieures du premier passage de positionnement (43A) et du deuxième passage de positionnement (43B), et le premier ergot de positionnement (14A) ainsi que le deuxième ergot de positionnement (14B) présentent respectivement des élévations aux côtés gauche et droit définies dans le sens de la largeur de la machine à laver; et quand la partie de recouvrement (11) s'accorde avec le panneau (4), le premier ergot de positionnement (14A) et le deuxième ergot de position-

nement (14B) s'étendent respectivement dans le premier passage de positionnement (43A) et le deuxième passage de positionnement (43B), et les élévations aux côtés gauche et droit ont respectivement un point de contact avec les faces latérales gauche et droite du premier passage de positionnement (43A) et du deuxième passage de positionnement (43B). 5

4. Machine à laver selon la revendication 1, **caractérisée en ce que** le premier ergot de positionnement (14A) et le deuxième ergot de positionnement (14B) sont situés sur la partie inférieure de la partie de recouvrement (11). 10

5. Machine à laver selon la revendication 1, **caractérisée en ce que** la partie de recouvrement présente un troisième ergot de positionnement (14c), la partie en fenêtre présente un troisième passage de positionnement (43c) contenant le troisième ergot de positionnement, les côtés gauche et droit du troisième ergot de positionnement présentent respectivement une cinquième élévation (15e) et une sixième élévation (15f), et les côtés gauche et droit du troisième passage de positionnement présentent respectivement une cinquième surface de positionnement (44e) et une sixième surface de positionnement (44f) ; et quand la partie de recouvrement s'accorde avec le panneau, le troisième ergot de positionnement s'étend à l'intérieur du troisième passage de positionnement, et la cinquième élévation ainsi que la sixième élévation ont respectivement un point de contact avec la cinquième surface de positionnement et la sixième surface de positionnement. 15 20 25 30 35

6. Machine à laver selon la revendication 1, **caractérisée en ce que** la partie en fenêtre présente une septième surface de positionnement (44g) faisant face à l'avant d'un sens de profondeur de la machine à laver, la partie de recouvrement présente une pluralité de septièmes élévations (15g), et quand la partie de recouvrement s'accorde avec la partie en fenêtre, les septièmes élévations ont un point de contact avec la septième surface de positionnement. 40 45

7. Machine à laver selon la revendication 6, **caractérisée en ce que** la partie de recouvrement présente une pluralité de crochets (13) qui s'étendent dans le sens de la profondeur (Y) de la machine à laver, et la partie en fenêtre présente une pluralité d'élévations de verrouillage (42) s'accordant avec les crochets. 50

8. Machine à laver selon la revendication 1, **caractérisée en ce que** la première surface de support (44A) et la deuxième surface de support (44B) s'étendent horizontalement et sont coplanaires. 55

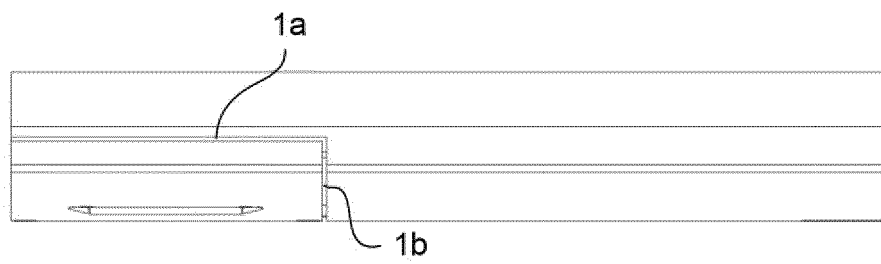


FIG. 1

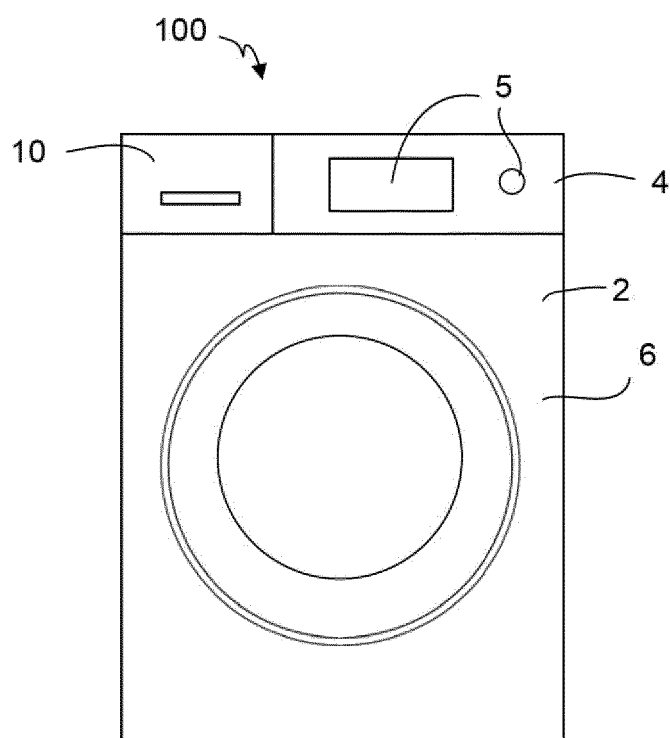


FIG. 2

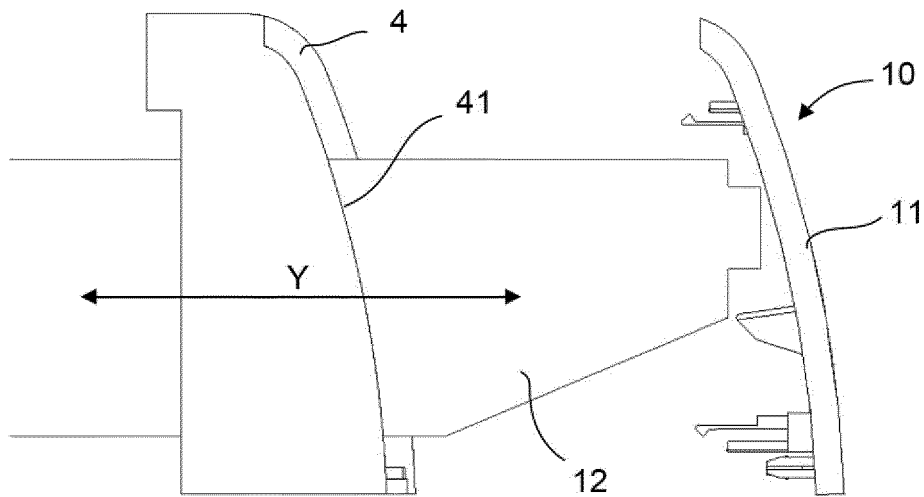


FIG. 3

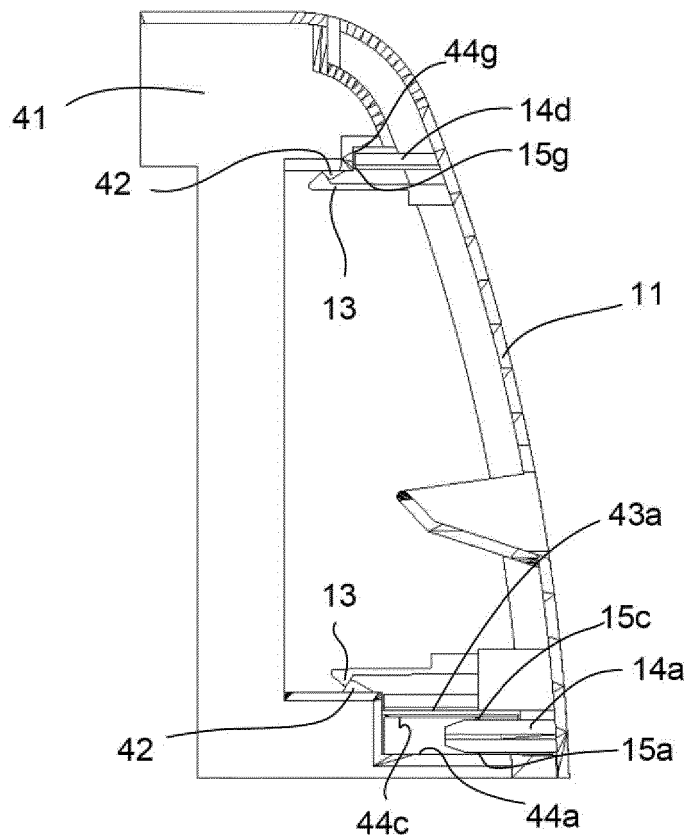


FIG. 4

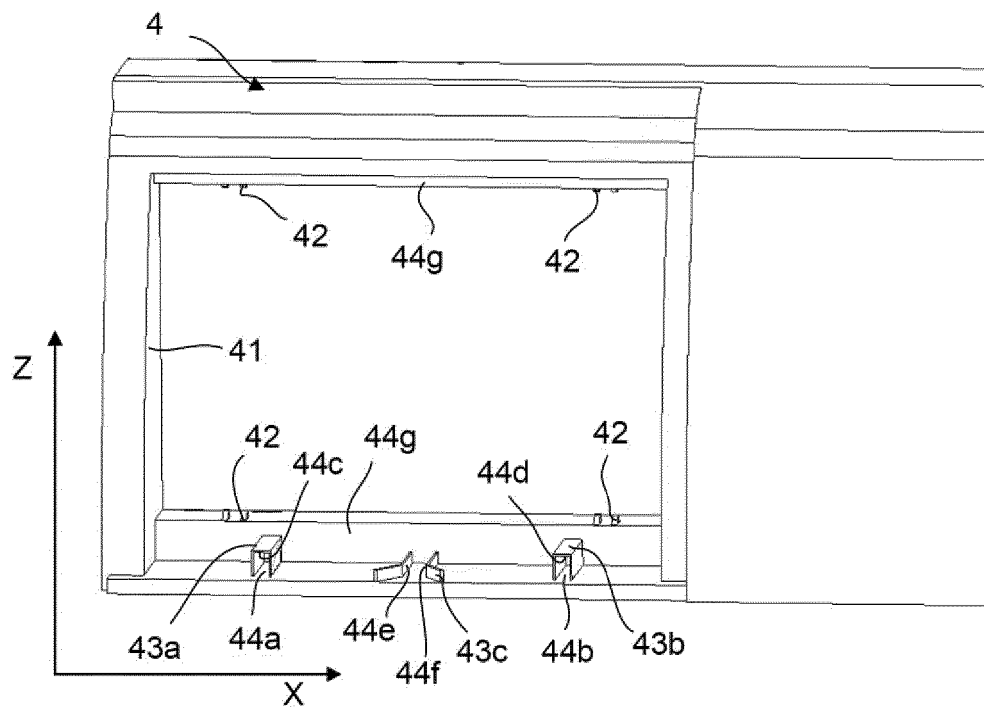


FIG. 5

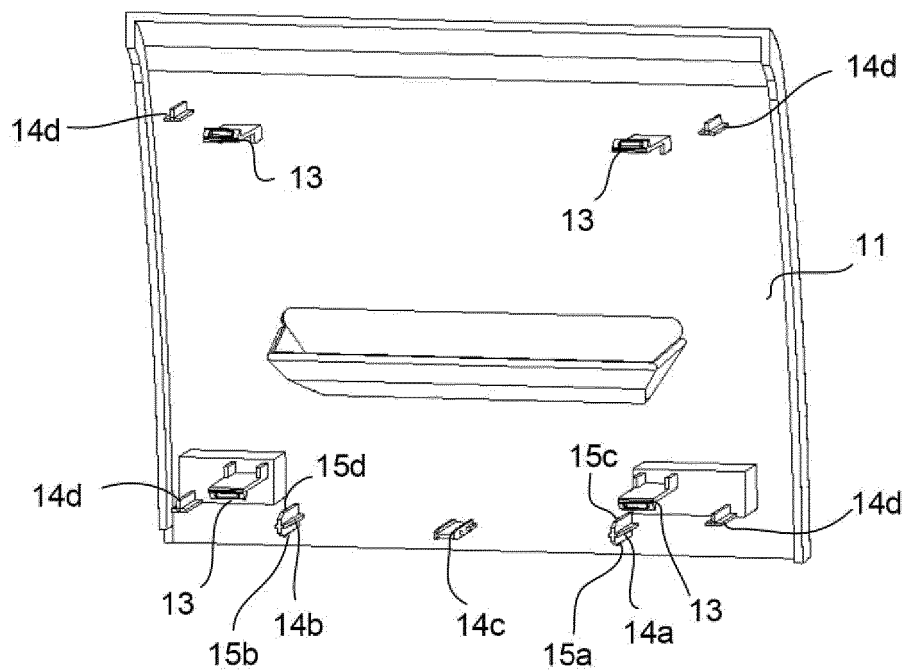


FIG. 6

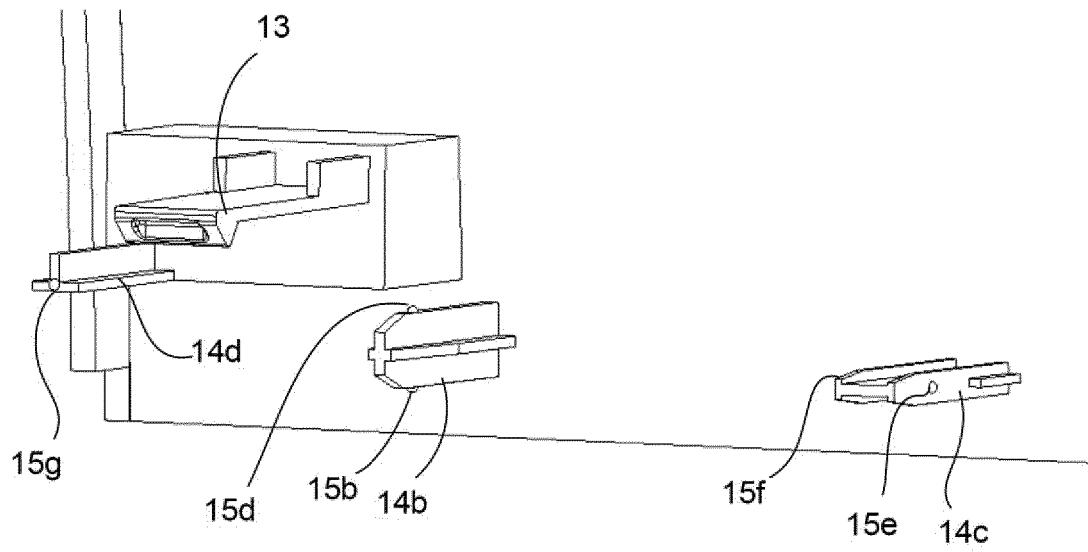


FIG. 7

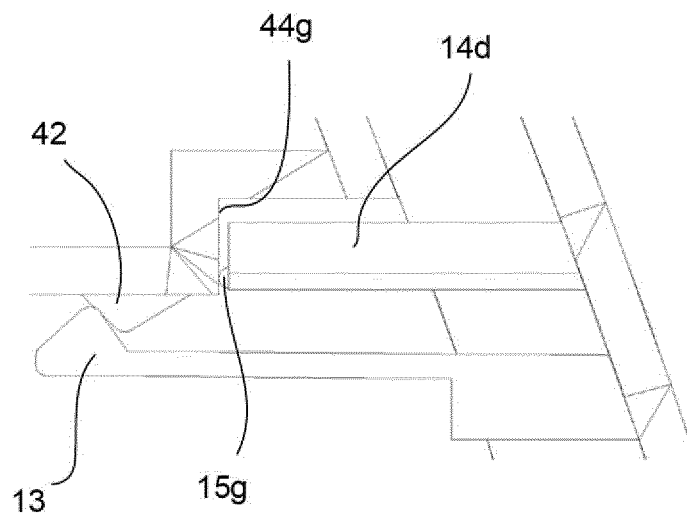


FIG. 8

REFERENCES CITED IN THE DESCRIPTION

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