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(54) **DETERGENT DISPENSING DEVICE, AND WASHING MACHINE**

(57) The present invention discloses a detergent dispensing device and a washing machine, and relates to the technical field of washing machines. The main technical solution is as follows: the detergent dispensing device includes a dispensing cavity, a panel, and a water channel structure, herein the dispensing cavity is placed in a washing machine to accommodate a detergent, and the dispensing cavity is provided with a first discharge opening. The panel is provided with a dispensing opening for dispensing the detergent into the dispensing cavity. The water channel structure is provided on the dispens-

ing cavity to add water into the dispensing cavity to dissolve the detergent and release the detergent into a washing drum of the washing machine through the first discharge opening. Further provided is a washing machine including the detergent dispensing device. The present invention mainly provides a novel detergent dispensing device to reduce the number of parts and lower costs. The detergent dispensing device prevents the detergent dispensing device from vibrating during operation of the washing machine, thereby reducing noise.

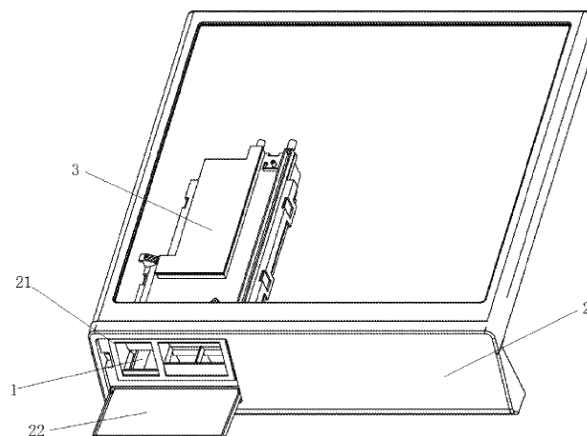


Fig. 1

Description

Cross-reference to Related Application

[0001] The present invention claims benefit of Chinese patent application number 201810042671.2, filed on January 17, 2018 and entitled "Detergent dispensing device and washing machine", the disclosure of which is hereby incorporated by reference in its entirety.

Technical Field

[0002] The present invention relates to the technical field of washing machines, and in particular to a detergent dispensing device and a washing machine.

Background

[0003] Along with the improvement of life quality of people, a popularity degree of drum washing machines is higher and higher.

[0004] In a related art, a dispensing device, used for dispensing a detergent, on the drum washing machine is usually set as a mode of a drawable drawer structure. Herein, while the detergent is dispensed, the drawer structure is pulled open, the detergent is placed in the drawer structure; and in a washing process, a spraying device on a top of the drawer structure sprays water into the drawer structure, to dissolve the detergent, and wash into the washing drum.

[0005] However, there are at least the following defects existing in the dispensing device in the drawer structure mode: (1) there are many parts of the drawer structure (such as, a drawer, a drawer handle, related parts for achieving pulling movement of the drawer and the spraying device), so the cost is higher; (2) while the washing machine is in operation, the drawer structure may be vibrated, and higher noise is generated; and (3) the drawer handle is positioned on an operation panel of the washing machine, the appearance of the entire washing machine may be affected.

Summary

[0006] In view of this, the present invention provides a detergent dispensing device and a washing machine, and mainly provides a novel detergent dispensing device, so as to reduce parts, and reduce the cost.

[0007] The present invention mainly provides the following technical scheme.

[0008] On one aspect, an embodiment of the present invention provides a detergent dispensing device, herein, the detergent dispensing device includes:

a dispensing cavity, placed in a washing machine to accommodate a detergent, herein, a first discharge opening is provided on the dispensing cavity;
a panel, the panel is provided with a dispensing

opening for dispensing the detergent into the dispensing cavity; and
a water channel structure, the water channel structure is provided on the dispensing cavity to add water into the dispensing cavity to dissolve the detergent and release the detergent into a washing drum of the washing machine through the first discharge opening.

[0009] Purposes of the present invention and technical problems thereof to be solved may also further be achieved by adopting the following technical measures.

[0010] In an exemplary embodiment, the detergent dispensing device further includes:

a cover body, the cover body is connected to the panel, and used to cover or open the dispensing opening on the panel.

[0011] In an exemplary embodiment, the cover body is provided with a first end and a second end oppositely installed, herein,

the first end of the cover body is rotatably connected with the panel, and the second end of the cover body is connected with the panel in a detachable mode.

[0012] In an exemplary embodiment, the panel is an operation panel of the washing machine; and/or the panel is placed in a position in front of a body of the washing machine, and adjacent to a top of the body of the washing machine.

[0013] In an exemplary embodiment, a top of the dispensing cavity is opened; and

the panel is disposed tightly close to a part of an outer edge of a top opening of the dispensing cavity, and a highest position of the dispensing opening is not lower than a position of the top opening of the dispensing cavity, so that the detergent is able to enter the dispensing cavity from the top opening of the dispensing cavity after passing through the dispensing opening.

[0014] In an exemplary embodiment, a setting angle α is formed between the panel and a vertical direction, herein α is greater than or equal to 15 degrees, and less than or equal to 20 degrees.

[0015] In an exemplary embodiment, a cavity wall of the dispensing cavity includes a first cavity wall and a second cavity wall oppositely installed; herein, the first cavity wall is disposed close to the dispensing opening, the second cavity wall is disposed away from the dispensing opening; and the first discharge opening is opened in the second cavity wall.

[0016] In an exemplary embodiment, a lower end of the first discharge opening is a lowest position of a cavity bottom of the dispensing cavity.

[0017] In an exemplary embodiment, the water channel structure includes:

a first structure, the first structure is provided on the cavity wall of the dispensing cavity;
a second structure, the second structure is connected to the first structure, and a first water supply chan-

nel is formed between the first structure and the first structure.

[0018] In an exemplary embodiment, a circle of the water channel structure is disposed around the cavity wall of the dispensing cavity, so that a first water supply channel forms an annular water supply channel matched with the shape of a top opening of the dispensing cavity.

[0019] In an exemplary embodiment, while the cavity wall of the dispensing cavity includes a first cavity wall and a second cavity wall oppositely installed, and the first discharge opening is disposed in the second cavity wall, herein,

the second structure, in a position corresponding to the second cavity wall, is provided with a water inlet communicated with the first water supply channel; and/or the cavity wall of the dispensing cavity is surrounded by the second cavity wall and a third cavity wall, herein, the third cavity wall includes the first cavity wall, herein, an opening is formed between the water channel structure and an inner wall surface of the third cavity wall, and the opening is a water outlet of the first water supply channel.

[0020] In an exemplary embodiment, the third cavity wall is approximately U-shaped.

[0021] In an exemplary embodiment, the first structure includes a first part and a second part, herein, one side of the first part is connected with an upper end of the cavity wall of the dispensing cavity, and the other side of the first part is extended to an outside of the dispensing cavity, the second part is provided at the other side of the first part, and forms a bulge relative to the first part; and

the second structure includes a third part and a fourth part, herein, the first part is covered by the third part, and the first water supply channel is formed between the third part and the first part, the fourth part is provided with a groove, and the second part is clamped in the groove.

[0022] In an exemplary embodiment, the detergent dispensing device further includes a collecting funnel, herein,

the dispensing cavity is placed in the collecting funnel, and the collecting funnel is provided with a second discharge opening communicated with the washing drum. In an exemplary embodiment, the detergent dispensing device further includes a water inlet cover, herein, the dispensing cavity is covered by the water inlet cover; and

the water inlet cover is provided with a second water supply channel, herein, one end of the second water supply channel is communicated with the water channel structure, and the other end of the second water supply channel is connected with a water inlet valve of the washing machine.

[0023] On the other aspect, the embodiment of the present invention provides a washing machine, herein, the washing machine includes any one of the above detergent dispensing devices.

[0024] Compared with the related technology, the de-

tergent dispensing device and the washing machine of the present invention have the following beneficial effects.

[0025] The detergent dispensing device provided by the embodiment of the present invention is capable of, through providing the dispensing cavity in the washing machine, and disposing the dispensing opening on the panel, enabling the detergent to be temporarily accommodated in the dispensing cavity through the dispensing opening, and through the water channel structure, adding water to the dispensing cavity, to dissolve the detergent, and release the detergent to the washing drum of the washing machine through the first discharge opening, achieving the dispensing of the detergent. Compared with the drawer-type dispensing device in the related technology, the detergent dispensing device of the embodiment is capable of eliminating related parts for achieving the drawer pulling movement, and the structure is simple, thereby the cost is reduced, in addition, while the washing machine is in operation, the vibration may not be generated, and the noise is reduced.

[0026] Further, the detergent dispensing device provided by the embodiment of the present invention is capable of, through disposing the cover body, while the detergent is dispensed by a user, just opening the cover body, and enabling the dispensing opening on the panel to be exposed externally, through the dispensing opening, after enabling the detergent to be dispensed into the dispensing cavity, closing the cover body; in such setting, the good appearance of the entire panel may be ensured.

[0027] Further, the detergent dispensing device provided by the embodiment of the present invention is capable of, through enabling the panel to be disposed tightly close to the edge of the top opening of the dispensing cavity, and enabling the highest position of the dispensing opening not to be lower than the opening position of the dispensing cavity, enabling the detergent to enter the dispensing cavity from the top opening of the dispensing cavity after passing through the dispensing opening; and enabling the panel to be slantwise disposed, so that the detergent is dispensed into the dispensing cavity from the dispensing opening, and it is convenient to the operation of the washing machine.

[0028] Further, the detergent dispensing device provided by the embodiment of the present invention is capable of, through enabling the water channel structure to be set as the first structure positioned at the upper end of the cavity wall of the dispensing cavity and the second structure connected to the first structure, enabling the first water supply channel to be formed between the second structure and the first structure, and enabling supplied water of the first water supply channel to be added to the dispensing cavity along the inner wall surface of the cavity wall of the dispensing cavity, dissolving the detergent well, and enabling the detergent to be released into the washing drum of the washing machine. In addition, compared with the spraying device in the related technology, the above water channel structure is simple

in structure, and less in parts, thereby the cost is reduced.

[0029] On the other aspect, the embodiment of the present invention further provides a washing machine, because the washing machine includes the above detergent dispensing device, the washing machine provided by the embodiment of the present invention has any one of the above beneficial effects, not repeatedly described here one by one.

[0030] The above description is only an overview of the technical schemes of the present invention, in order to more clearly understand the technical measures of the present invention, and implement in accordance with the content of the description, it is described in detail below by the preferable embodiments of the present invention in combination with the drawings.

Brief Description of the Drawings

[0031]

Fig. 1 is a structure schematic diagram of a detergent dispensing device provided by the embodiment of the present invention;

Fig. 2 is a structure side view of the detergent dispensing device provided by the embodiment of the present invention;

Fig. 3 is an interior structure schematic diagram of the detergent dispensing device provided by the embodiment of the present invention;

Fig. 4 is a structure schematic diagram of a dispensing cavity provided by the embodiment of the present invention;

Fig. 5 is an interior structure section view of the detergent dispensing device provided by the embodiment of the present invention;

Fig. 6 is a local structure enlarged diagram of the structure as shown in Fig. 5;

Fig. 7 is the other structure section view of the detergent dispensing device provided by the embodiment of the present invention; and

Fig. 8 is the other structure section view of the detergent dispensing device provided by the embodiment of the present invention.

Detailed Description of the Embodiments

[0032] In order to further illustrate the technical measures and effects adopted by the present invention to achieve the intended purpose of the invention, specific implementation modes, structures, features and functions thereof according to the present invention are described in detail below with reference to the drawings and the preferable embodiments. In the following description, different "one embodiment" or "an embodiment" does not necessarily refer to the same embodiment. In addition, the specific features, structures, or characteristics in one or more embodiments may be combined in any suitable forms.

Embodiment 1

[0033] The embodiment provides a detergent dispensing device, provided on a washing machine, and used to temporarily accommodate a detergent, especially used to accommodate a solid-state detergent, such as washing powder. As shown in Fig. 1 to Fig. 8, the detergent dispensing device in the embodiment includes: a dispensing cavity 1, a panel 2, and a water channel structure 13, herein the dispensing cavity 1 is placed in a washing machine to accommodate a detergent, and the dispensing cavity 1 is provided with a first discharge opening 101. The panel 2 is provided on the washing machine, and the panel 2 is provided with a dispensing opening 21 for dispensing the detergent into the dispensing cavity 1. The water channel structure 13 is provided on the dispensing cavity to add water into the dispensing cavity 1 to dissolve the detergent and release the detergent into a washing drum of the washing machine through the first discharge opening 101.

[0034] The detergent dispensing device provided by the embodiment of the present invention is capable of, through disposing the dispensing cavity in the washing machine, and disposing the dispensing opening on the panel, enabling the detergent to be temporarily accommodated in the dispensing cavity through the dispensing opening, and through the water channel structure, adding water to the dispensing cavity, to dissolve the detergent, and release the detergent to the washing drum of the washing machine through the first discharge opening, achieving the dispensing of the detergent. Compared with the drawer-type dispensing device in the related technology, the detergent dispensing device of the embodiment is capable of eliminating related parts for achieving the drawer pulling movement, and the structure is simple, thereby the cost is reduced, in addition, while the washing machine is in operation, the vibration may not be generated, and the noise is reduced.

[0035] Furthermore, the detergent dispensing device provided by the embodiment and the following embodiments is suitable for the washing machines in any heights, and especially for the washing machine in a height of 800-850 mm.

Embodiment 2

[0036] Preferably, the embodiment provides a detergent dispensing device, compared with the above embodiment, as shown in Fig. 1 and Fig. 2, in order to improve the appearance of the washing machine, the embodiment is further designed as follows: the detergent dispensing device of the embodiment further includes a cover body 22, herein, the cover body 22 is connected to the panel 2, and used to cover or open the dispensing opening 21 on the panel 2. Preferably, the cover body 22 is provided with a first end and a second end oppositely installed, herein, the first end of the cover body 22 is rotatably connected with the panel 2, and the second end

of the cover body 22 is connected with the panel 2 in a detachable mode.

[0037] The detergent dispensing device provided by the embodiment of the present invention is capable of, through disposing the cover body, while the detergent is dispensed by a user, just opening the cover body, and enabling the dispensing opening on the panel to be exposed externally, through the dispensing opening, after enabling the detergent to be dispensed into the dispensing cavity, closing the cover body; in such setting, the good appearance of the entire panel may be ensured.

Embodiment 3

[0038] Preferably, the embodiment provides a detergent dispensing device, compared with the above embodiment, as shown in Fig. 1 and Fig. 2, the panel 2, and a relative position of the panel 2 and the dispensing cavity 1 are further designed by the embodiment as follows.

[0039] The panel 2 in the embodiment is mainly used as an operation panel of a washing machine. Further, the panel 2 in the embodiment is placed in a position in front of a body of the washing machine, and adjacent to a top of the body of the washing machine.

[0040] Preferably, a top of the dispensing cavity 1 is opened; the panel 2 is disposed tightly close to a part of an outer edge of a top opening of the dispensing cavity 1 (the panel in the embodiment does not cover the dispensing cavity, but is positioned at one side of the dispensing cavity, and the panel 2 is disposed opposite to a first cavity wall 11 mentioned in the following embodiments), and a highest position of the dispensing opening 21 is not lower than a position of the top opening of the dispensing cavity 1, so that the detergent is able to enter the dispensing cavity 1 from the top opening of the dispensing cavity 1 after passing through the dispensing opening 21.

[0041] Preferably, a setting angle α is formed between the panel 2 in the embodiment and a vertical direction, herein α is greater than or equal to 0 degree and less than or equal to 90 degrees. Preferably, the panel 2 in the embodiment is slantwise disposed, preferably, α is greater than or equal to 15 degrees, and less than or equal to 20 degrees; through such setting, a detergent is conveniently dispensed into the dispensing cavity from the dispensing opening 21, and it is convenient to the operation of the washing machine. Preferably, while the panel 2 is slantwise disposed, an upper end of the panel 2 is inclined towards an inner side of the washing machine, and a lower end of the panel 2 is inclined towards a direction away from the washing machine.

Embodiment 4

[0042] Preferably, the embodiment provides a detergent dispensing device, compared with the above embodiment, as shown in Fig. 1 to Fig. 8, the first discharge opening 101 and the dispensing cavity 1 are further de-

signed by the embodiment as follows: a cavity wall of the dispensing cavity 1 includes a first cavity wall 11 and a second cavity wall oppositely installed; herein, the first cavity wall 11 is disposed close to the dispensing opening 21, the second cavity wall is disposed away from the dispensing opening 21; and the first discharge opening 101 is opened in the second cavity wall. Preferably, a lower end of the first discharge opening 101 is a lowest position of a cavity bottom 14 of the dispensing cavity 1. Herein, the lower end of the first discharge opening 101 is a part of the cavity bottom 14 of the dispensing cavity 1, and the cavity bottom 14 of the dispensing cavity 1 is slantwise disposed towards the lower end of the first discharge opening 101; and through such setting, the detergent is conveniently released to the washing drum of the washing machine by water through the first discharge opening 101.

Embodiment 5

[0043] Preferably, the embodiment provides a detergent dispensing device, compared with the above embodiment, as shown in Fig. 1 to Fig. 8, a water channel structure 13 is further designed by the embodiment as follows.

[0044] The water channel structure 13 in the embodiment includes a first structure 132 and a second structure 131. Herein, the first structure 132 is provided on the cavity wall of the dispensing cavity 1; and the second structure 131 is connected to the first structure 132, and a first water supply channel 130 is formed between the second structure 131 and the first structure 132.

[0045] Preferably, a circle of the water channel structure 13 is disposed around the cavity wall 10 of the dispensing cavity 1, so that the first water supply channel 130 forms an annular water supply channel matched with the shape of a top opening of the dispensing cavity 1.

[0046] Preferably, while the cavity wall 10 of the dispensing cavity 1 includes a first cavity wall 11 and a second cavity wall oppositely installed, and the first discharge opening 101 is disposed in the second cavity wall, herein, the second structure 131, in a position corresponding to the second cavity wall, is provided with a water inlet 1301 communicated with the first water supply channel 130. The cavity wall 10 of the dispensing cavity 1 is surrounded by the second cavity wall and a third cavity wall, herein, the third cavity wall includes the first cavity wall 11 and two fourth cavity walls 12 oppositely installed; herein, an opening is formed between the water channel structure 13 and an inner wall surface of the third cavity wall, the opening is a water outlet 1302 of the first water supply channel 130. Herein, through such setting, water of the first water supply channel is flowed into the dispensing cavity along the inner wall surface of the third cavity wall (including the first cavity wall 11 and the two fourth cavity walls 12), the detergent may be dissolved well, and the detergent is released to the washing drum of the washing machine.

[0047] Preferably, the third cavity wall (including the first cavity wall 11 and the two fourth cavity walls 12) of the dispensing cavity 1 in the embodiment is approximately U-shaped.

[0048] Preferably, the first structure 132 and the second structure 131 are further designed by the embodiment as follows: the first structure 132 includes a first part 1321 and a second part 1322, herein, one side of the first part 1321 is connected with an upper end of the cavity wall of the dispensing cavity 1, and the other side of the first part 1321 is extended to an outside of the dispensing cavity 1, the second part 1322 is provided at the other side of the first part 1321, and forms a bulge relative to the first part 1321. Preferably, the first part 1321 is perpendicular to the cavity wall of the dispensing cavity, and outwards extended. The second part 1322 is perpendicular to the first part 1321, and upwards extended. Preferably, the first structure 132 and the dispensing cavity 1 are an integrally-formed structure. The second structure 131 includes a third part 1311 and a fourth part 1312; herein, the first part 1321 is covered by the third part 1311, and the first water supply channel 130 is formed between the third part 1311 and the first part 1321, the fourth part 1312 is provided with a groove, and the second part 1322 is clamped in the groove. Preferably, a clearance is reserved between the third part 1311 and an inner wall surface of the third cavity wall of the dispensing cavity, and used as a water outlet. It is sealed between the third part 1311 and the second cavity wall of the dispensing cavity. Preferably, the first structure 132 is provided with multiple locking buttons 1323, and the second structure is provided with multiple locking slots 1313, herein, the number of the locking buttons 1323 is the same as the number of the locking slots 1313, and they are correspondingly locked one by one.

[0049] The detergent dispensing device provided by the embodiment is capable of, through enabling the water channel structure to be set as the first structure positioned at the upper end of the cavity wall of the dispensing cavity and the second structure connected to the first structure, enabling the first water supply channel to be formed between the second structure and the first structure, and enabling supplied water of the first water supply channel to be added to the dispensing cavity along the inner wall surface of the cavity wall of the dispensing cavity, dissolving the detergent well, and enabling the detergent to be released into the washing drum of the washing machine. In addition, compared with the spraying device in the related technology, the above water channel structure is simple in structure, and less in parts, thereby the cost is reduced.

Embodiment 6

[0050] Preferably, the embodiment provides a detergent dispensing device, compared with the above embodiment, as shown in Fig. 1 to Fig. 8, the detergent dispensing device of the embodiment further includes a

collecting funnel 4 and a water inlet cover 3, herein, the dispensing cavity 1 is placed in the collecting funnel 4 (the collecting funnel 4 is disposed outside the dispensing cavity 1, and the bottom of the dispensing cavity 1 is surrounded), and the collecting funnel 4 is provided with a second discharge opening 41 communicated with a washing drum. The second discharge opening 41 is opened in the bottom of the collecting funnel 4, and the second discharge opening 41 is in a lowest position of the bottom of the collecting funnel.

[0051] Preferably, the dispensing cavity 1 is covered by the water inlet cover 3; the water inlet cover 3 covers the collecting funnel 4, and is connected with the collecting funnel 4. The water inlet cover 3 is provided with a second water supply channel 31, herein, one end of the second water supply channel 31 is communicated with the water channel structure 13 (one end of the second water supply channel 31 is connected with a water inlet 1301 of the water channel structure), and the other end of the second water supply channel 31 is connected with a water inlet valve of a washing machine.

[0052] The detergent dispensing device provided by the embodiment is capable of, through disposing the collecting funnel and the water inlet cover, achieving the water supply of the detergent dispensing device, and the communication with a washing drum of the washing machine by means of the simple structure.

Embodiment 7

[0053] On the other aspect, the embodiment provides a washing machine, herein, the washing machine of the embodiment includes the detergent dispensing device of any one of the above embodiments. Preferably, the washing machine in the embodiment is a drum-type washing machine. Preferably, a height of the washing machine in the embodiment is 800-850 mm.

[0054] Herein, because the washing machine of the embodiment includes the detergent dispensing device in any one of the above embodiments, the washing machine of the embodiment has the beneficial effects of any one of the above embodiments, which is not repeatedly described here one by one.

[0055] While the washing machine of the embodiment is used, the cover body on an operation panel is opened by a user, the detergent (for example, washing powder) is dispensed into the dispensing cavity after passing through a dispensing opening on the panel. After the washing machine is started, a part of supplied water is able to enter the first water supply channel through the second water supply channel on the water inlet cover, water of the first water supply channel is added into the dispensing cavity along an inner wall surface of the side wall of the dispensing cavity, and then the mixed detergent is discharged to the collecting funnel from the first discharge opening on the dispensing cavity, and further discharged to the washing drum of the washing machine from the second discharge opening on the collecting fun-

nel.

[0056] In conclusion, the detergent dispensing device and the washing machine provided by the embodiment of the present invention are capable of, through disposing the dispensing cavity in the washing machine, and disposing the dispensing opening on the panel, enabling the detergent to be temporarily accommodated in the dispensing cavity through the dispensing opening, and through the water channel structure, adding water to the dispensing cavity, to dissolve the detergent, and release the detergent to the washing drum of the washing machine through the first discharge opening, achieving the dispensing of the detergent. Compared with the drawer-type dispensing device in the related technology, the detergent dispensing device of the embodiment is capable of eliminating related parts for achieving the drawer pulling movement, and the structure is simple, thereby the cost is reduced, in addition, while the washing machine is in operation, the vibration may not be generated, and the noise is reduced.

[0057] In summary, it is easily understood by those skilled in the art that each of the above beneficial modes may be freely combined and superposed without conflicting.

[0058] The above are only the preferable embodiments of the present invention, and not intended to limit the present invention in any modes, any simple modifications, equivalent changes and decorations made to the above embodiments according to the technical essence of the present invention still fall within a scope of the technical schemes of the present invention.

Claims

1. A detergent dispensing device, comprising:

a dispensing cavity, placed in a washing machine to accommodate a detergent, wherein, a first discharge opening is provided on the dispensing cavity;
a panel, the panel is provided with a dispensing opening for dispensing the detergent into the dispensing cavity; and
a water channel structure, the water channel structure is provided on the dispensing cavity to add water into the dispensing cavity to dissolve the detergent and release the detergent into a washing drum of the washing machine through the first discharge opening.

2. The detergent dispensing device as claimed in claim 1, further comprising:

a cover body, the cover body is connected to the panel, and configured to cover or open the dispensing opening on the panel.

3. The detergent dispensing device as claimed in claim

2, wherein the cover body is provided with a first end and a second end oppositely installed, wherein, the first end of the cover body is rotatably connected with the panel, and the second end of the cover body is connected with the panel in a detachable mode.

4. The detergent dispensing device as claimed in claim 1, wherein the panel is an operation panel of the washing machine; and/or the panel is placed in a position in front of a body of the washing machine, and adjacent to a top of the body of the washing machine.

5. The detergent dispensing device as claimed in claim 1 or 4, wherein a top of the dispensing cavity is opened; and the panel is disposed tightly close to a part of an outer edge of a top opening of the dispensing cavity, and a highest position of the dispensing opening is not lower than a position of the top opening of the dispensing cavity, so that the detergent is able to enter the dispensing cavity from the top opening of the dispensing cavity after passing through the dispensing opening.

6. The detergent dispensing device as claimed in claim 5, wherein a setting angle α is formed between the panel and a vertical direction, wherein α is greater than or equal to 15 degrees, and less than or equal to 20 degrees.

7. The detergent dispensing device as claimed in claim 1, wherein a cavity wall of the dispensing cavity comprises a first cavity wall and a second cavity wall oppositely installed; wherein, the first cavity wall is disposed close to the dispensing opening, the second cavity wall is disposed away from the dispensing opening; and the first discharge opening is opened in the second cavity wall.

8. The detergent dispensing device as claimed in claim 7, wherein a lower end of the first discharge opening is a lowest position of a cavity bottom of the dispensing cavity.

9. The detergent dispensing device as claimed in any one of claims 1-4 and claims 6-8, wherein the water channel structure comprises:

a first structure, the first structure is provided on a cavity wall of the dispensing cavity; and a second structure, the second structure is connected to the first structure, and a first water supply channel is formed between the first structure and the first structure.

10. The detergent dispensing device as claimed in claim 9, wherein a circle of the water channel structure is

disposed around the cavity wall of the dispensing cavity, so that a first water supply channel forms an annular water supply channel matched with the shape of a top opening of the dispensing cavity.

11. The detergent dispensing device as claimed in claim 10, wherein while the cavity wall of the dispensing cavity comprises a first cavity wall and a second cavity wall oppositely installed, and the first discharge opening is disposed in the second cavity wall, wherein, the second structure, in a position corresponding to the second cavity wall, is provided with a water inlet communicated with the first water supply channel; and/or the cavity wall of the dispensing cavity is surrounded by the second cavity wall and a third cavity wall, wherein, the third cavity wall comprises the first cavity wall, wherein, an opening is formed between the water channel structure and an inner wall surface of the third cavity wall, and the opening is a water outlet of the first water supply channel.
12. The detergent dispensing device as claimed in claim 11, wherein the third cavity wall is approximately U-shaped.
13. The detergent dispensing device as claimed in claim 11, wherein the first structure comprises a first part and a second part, wherein, one side of the first part is connected with an upper end of the cavity wall of the dispensing cavity, and the other side of the first part is extended to an outside of the dispensing cavity, the second part is provided at the other side of the first part, and forms a bulge relative to the first part; and the second structure comprises a third part and a fourth part, wherein, the first part is covered by the third part, and the first water supply channel is formed between the third part and the first part, the fourth part is provided with a groove, and the second part is clamped in the groove.
14. The detergent dispensing device as claimed in claim 1, wherein the detergent dispensing device further comprises a collecting funnel, wherein, the dispensing cavity is placed in the collecting funnel, and the collecting funnel is provided with a second discharge opening communicated with the washing drum.
15. The detergent dispensing device as claimed in claim 1 or 14, wherein the detergent dispensing device further comprises a water inlet cover, wherein, the dispensing cavity is covered by the water inlet cover; and the water inlet cover is provided with a second water supply channel, wherein, one end of the second wa-

ter supply channel is communicated with the water channel structure, and the other end of the second water supply channel is connected with a water inlet valve of the washing machine.

16. A washing machine, wherein, the washing machine comprises the detergent dispensing device as claimed in any one of claims 1-15.

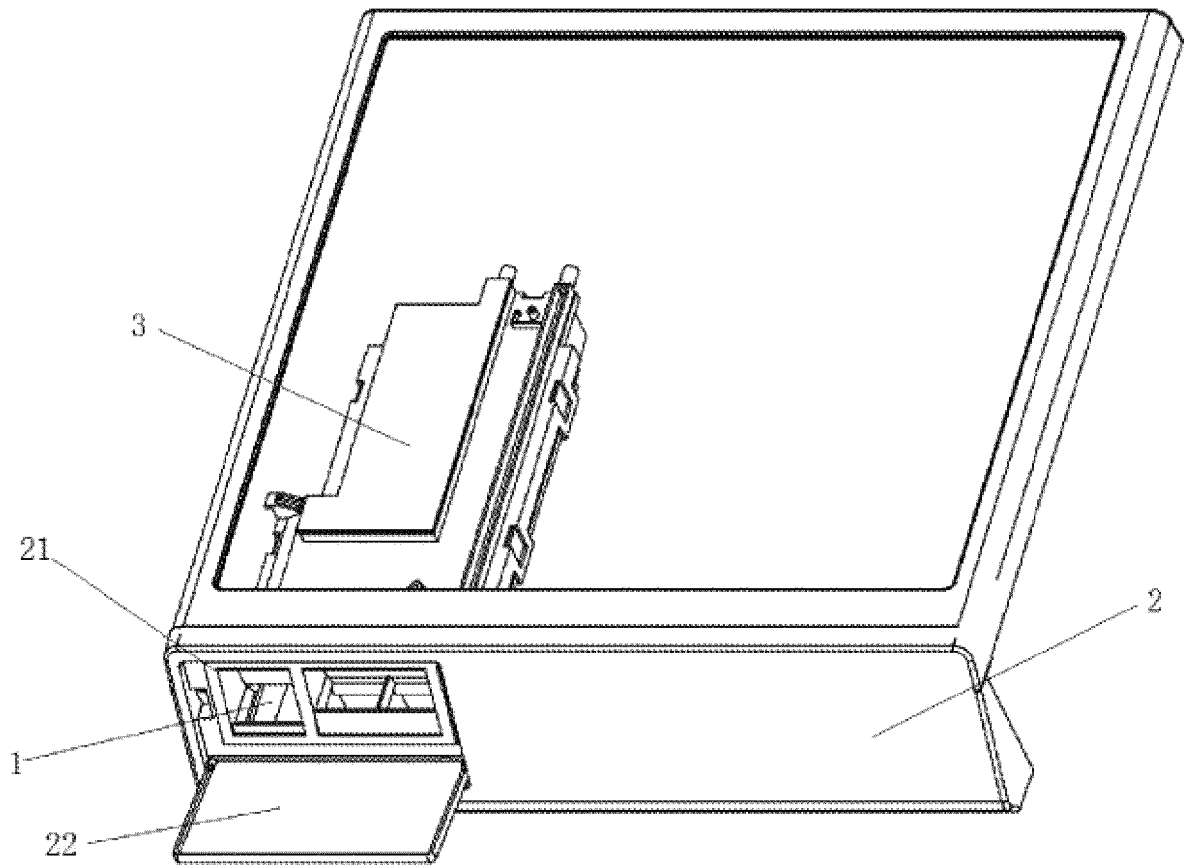


Fig. 1

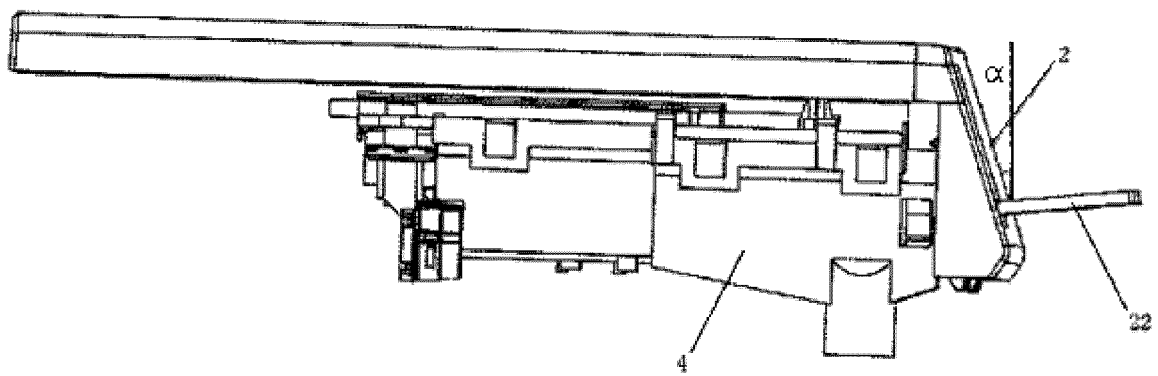


Fig. 2

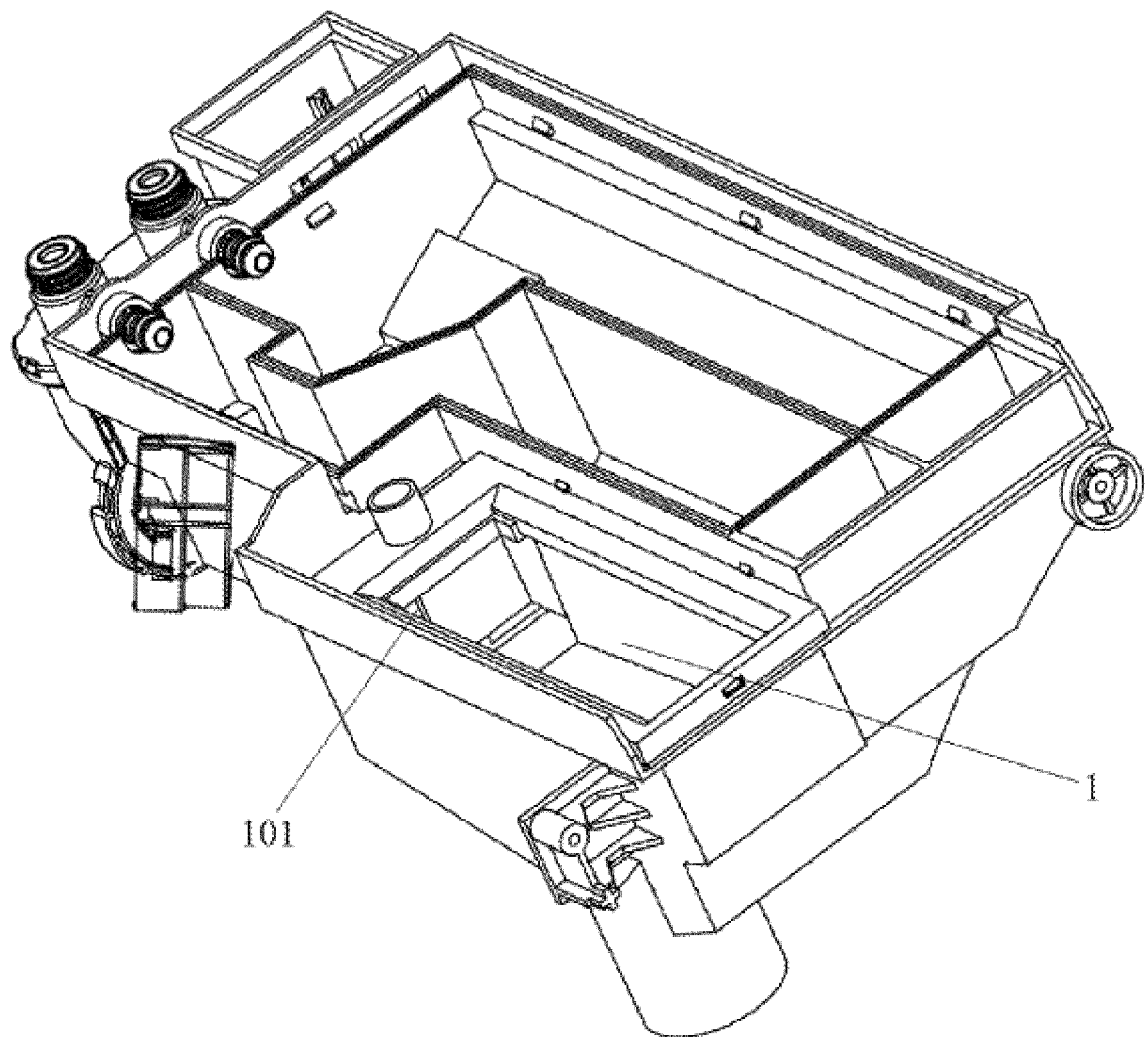


Fig. 3

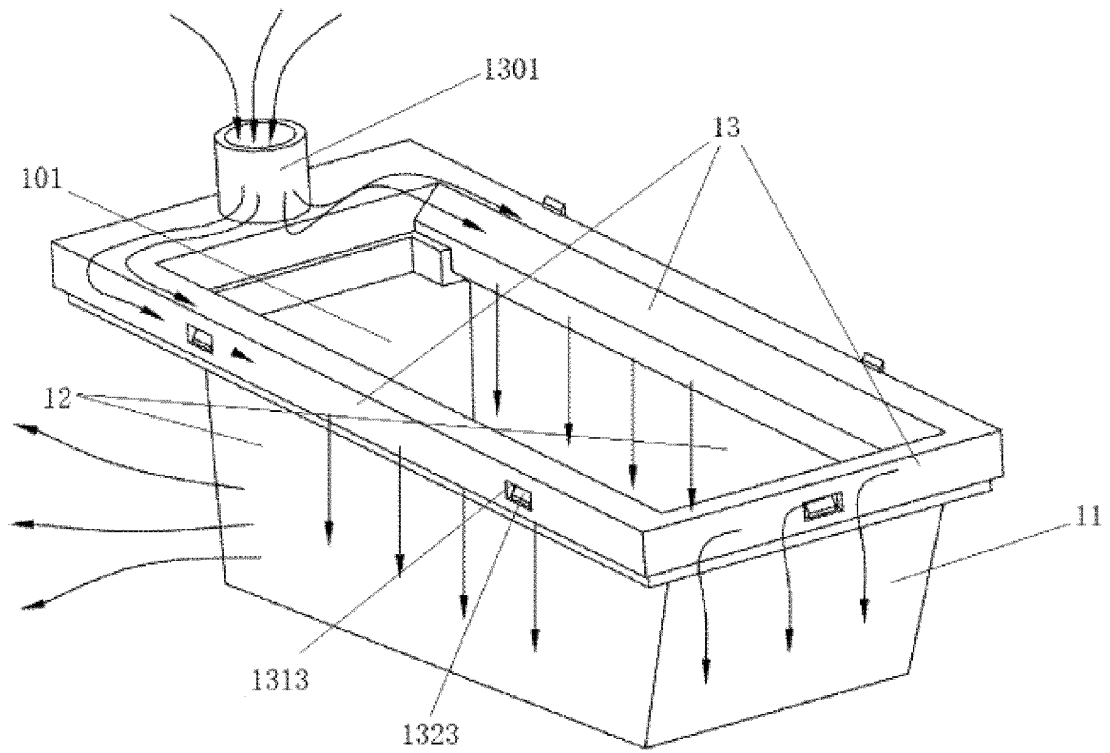


Fig. 4

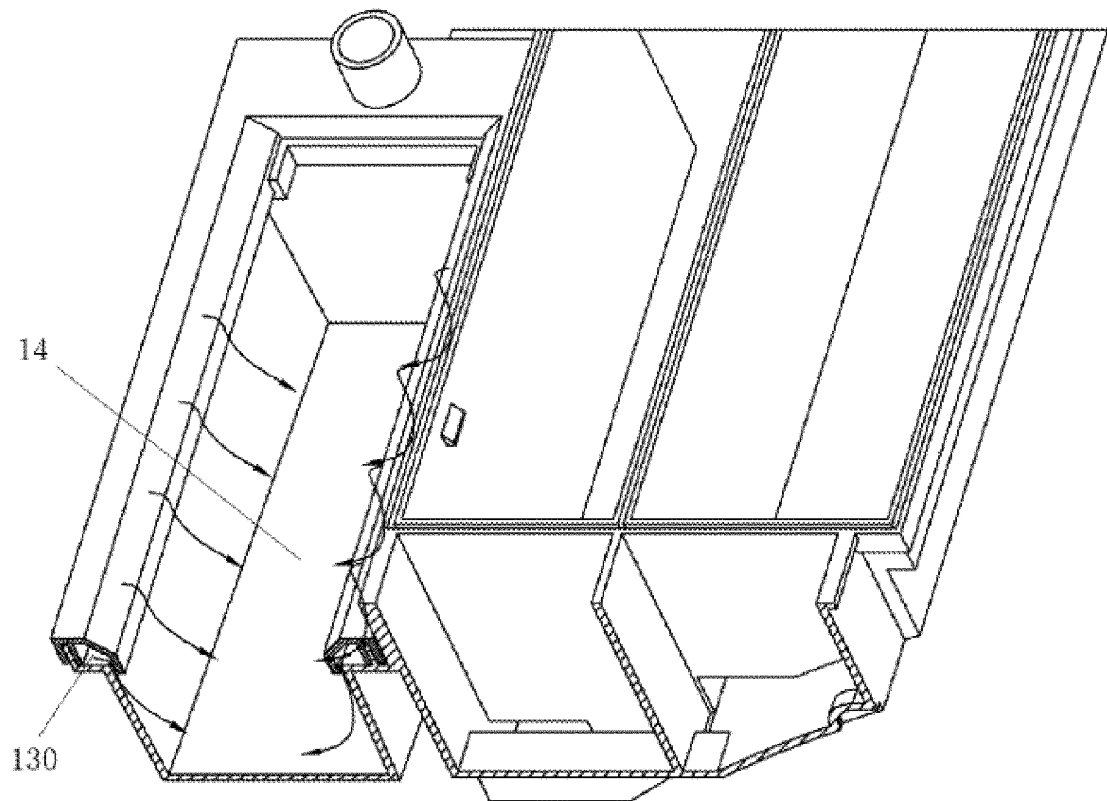


Fig. 5

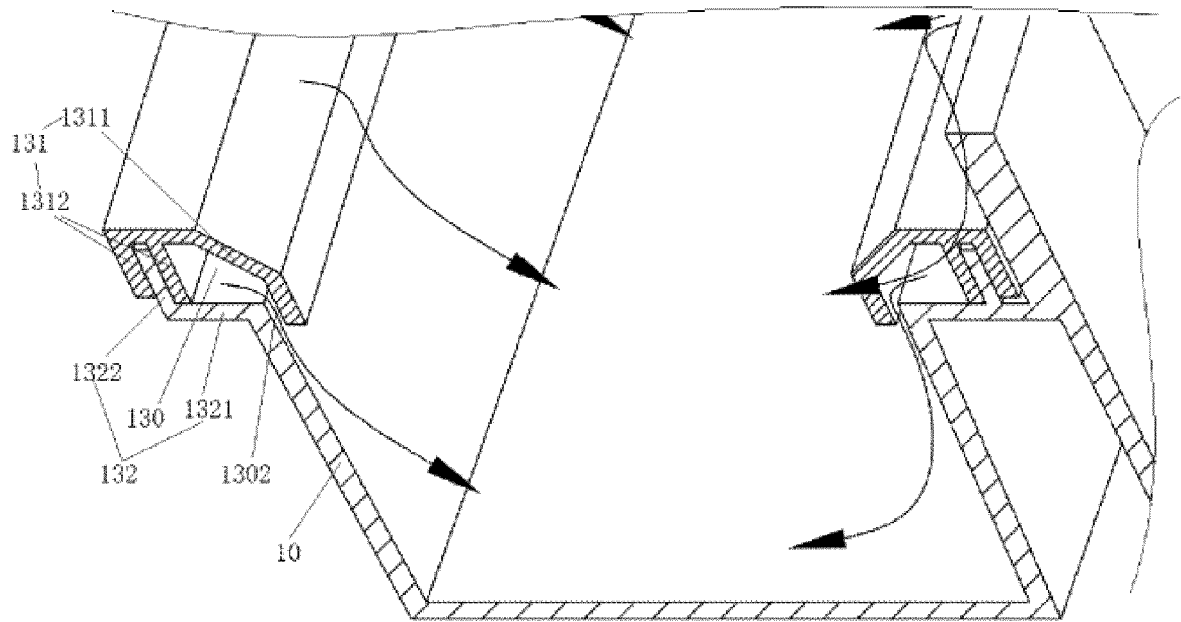


Fig. 6

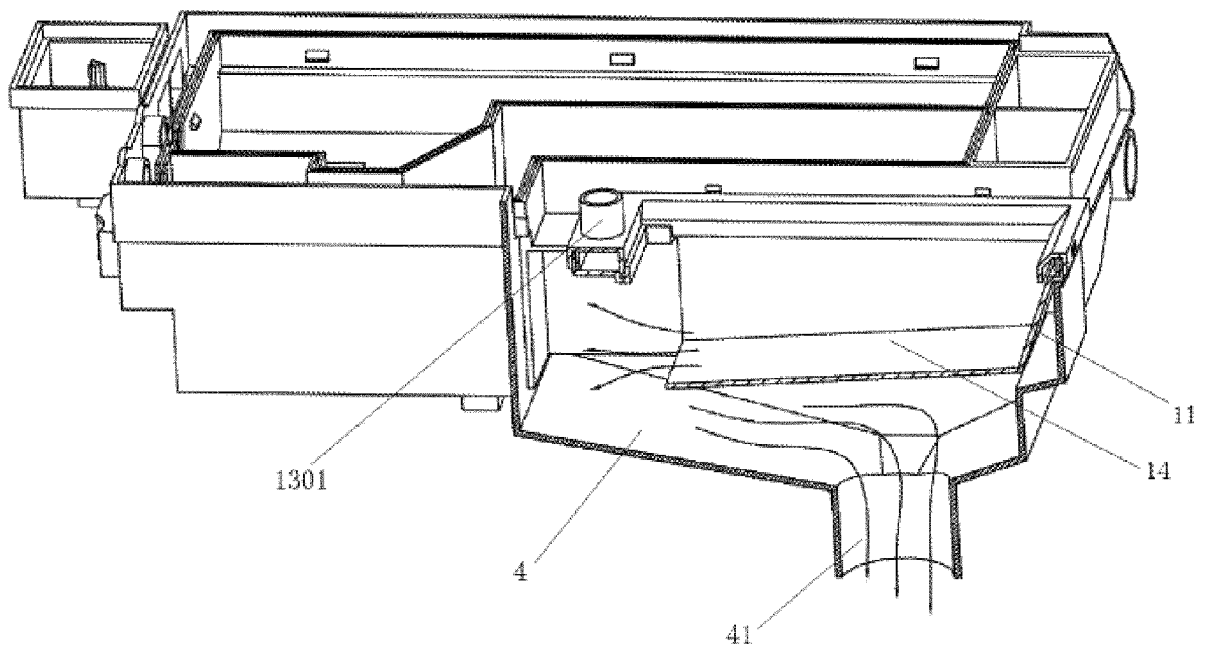


Fig. 7

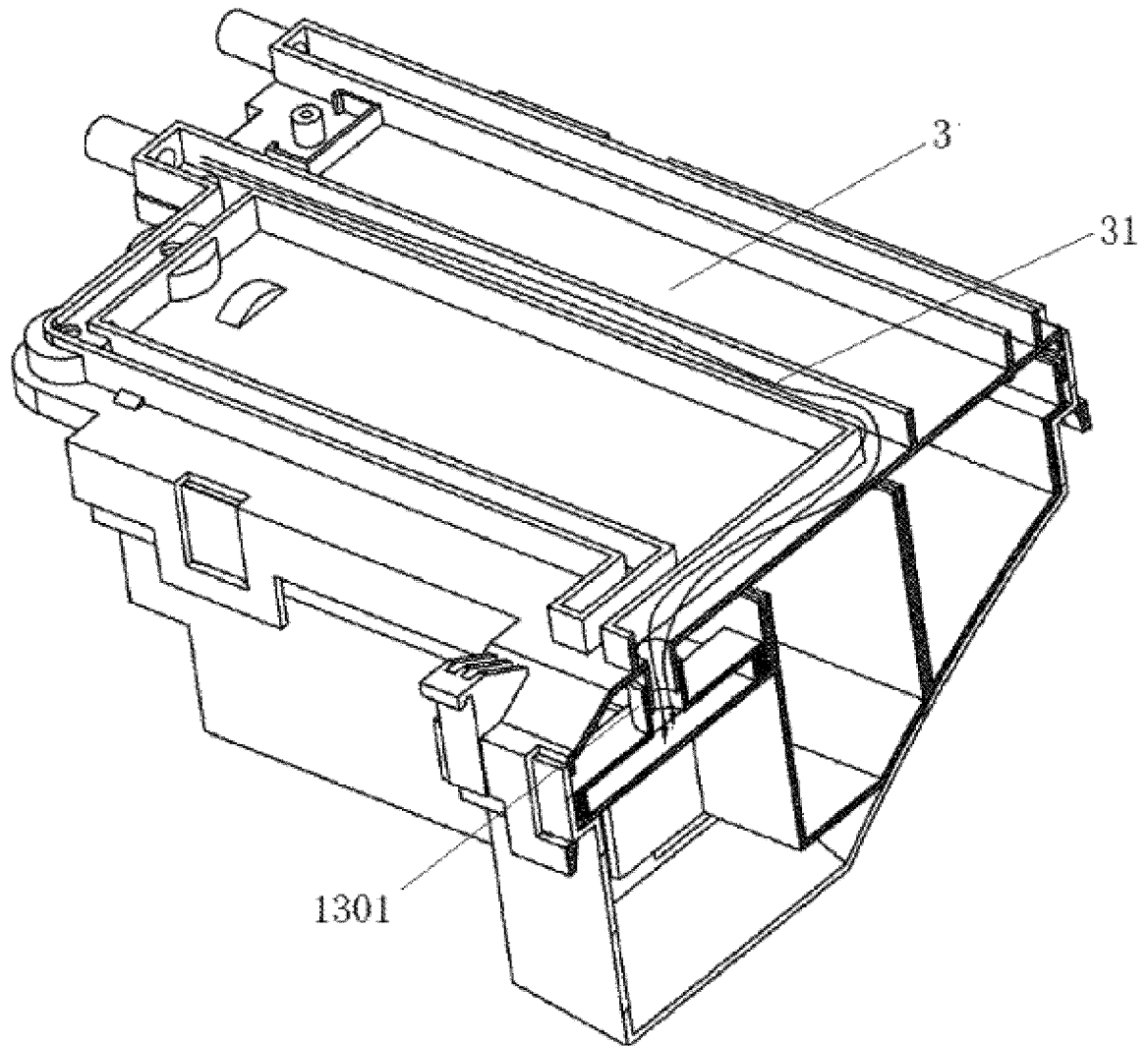


Fig. 8

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2018/123061

5	A. CLASSIFICATION OF SUBJECT MATTER		
	D06F 39/02(2006.01)i		
	According to International Patent Classification (IPC) or to both national classification and IPC		
	B. FIELDS SEARCHED		
10	Minimum documentation searched (classification system followed by classification symbols)		
	D06F		
	Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
15	Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
	CNABS; SIPOABS; DWPI; CNKI: 面板, 板, 壳, 前封门, 门, 投放, 添加, front, plate, board, panel, door, cover, feed+, supply, suppli+, agent, detergent		
	C. DOCUMENTS CONSIDERED TO BE RELEVANT		
20	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	X	CN 102021793 A (SAMSUNG ELECTRONICS CO., LTD.) 20 April 2011 (2011-04-20) description, paragraphs [0039]-[0093], and figures 1-10	1-6, 9, 10, 15, 16
	Y	CN 102021793 A (SAMSUNG ELECTRONICS CO., LTD.) 20 April 2011 (2011-04-20) description, paragraphs [0039]-[0093], and figures 1-10	11-13
25	Y	CN 104746310 A (HAIER GROUP CORPORATION ET AL.) 01 July 2015 (2015-07-01) description, paragraphs [0056]-[0059], and figures 10-13	11-13
	X	CN 106468007 A (PANASONIC HOME APPLIANCES R&D CENTER (HANGZHOU) CO., LTD. ET AL.) 01 March 2017 (2017-03-01) description, paragraphs [0036]-[0052], and figures 1-10	1-8, 14, 16
30	X	CN 105463787 A (WHIRLPOOL CHINA CO., LTD.) 06 April 2016 (2016-04-06) description, paragraphs [0021] and [0022], and figures 1-4	1-3, 5, 6, 16
	X	CN 202323452 U (NANJING LG PANDA APPLIANCES CO., LTD.) 11 July 2012 (2012-07-11) description, paragraphs [0017]-[0025], and figures 1-7	1-3, 5, 6, 14, 16
35	X	JP 2004329536 A (TOSHIBA CORP) 25 November 2004 (2004-11-25) description, paragraphs [0032]-[0079], and figures 1-7	1-3, 5, 6, 14, 16
	☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
40	* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "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) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed		
45	"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 "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "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		Date of mailing of the international search report
	07 March 2019		27 March 2019
50	Name and mailing address of the ISA/CN		Authorized officer
	State Intellectual Property Office of the P. R. China (ISA/CN) No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088 China		
55	Facsimile No. (86-10)62019451		Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2018/123061

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2015057176 A (HITACHI APPLIANCES INC) 26 March 2015 (2015-03-26) description, paragraphs [0011]-[0091], and figures 1-13	1-6, 14, 16
PX	CN 108060552 A (GREE ELECTRIC APPLIANCES INC. OF ZHUHAI) 22 May 2018 (2018-05-22) claims 1-16	1-16
PX	CN 207933739 U (GREE ELECTRIC APPLIANCES INC. OF ZHUHAI) 02 October 2018 (2018-10-02) claims 1-16	1-16
A	CN 106868800 A (HISENSE (SHANDONG) REFRIGERATOR CO., LTD.) 20 June 2017 (2017-06-20) entire document	1-16
A	DE 10355451 A1 (BSH BOSCH SIEMENS HAUSGERAETE) 23 June 2005 (2005-06-23) entire document	1-16

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2018/123061

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 102021793 A	20 April 2011	CN 102021793 B	19 November 2014
		EP 2295625 A1	16 March 2011
		US 2011056250 A1	10 March 2011
		KR 101466332 B1	27 November 2014
		KR 20110027001 A	16 March 2011
CN 104746310 A	01 July 2015	None	
CN 106468007 A	01 March 2017	None	
CN 105463787 A	06 April 2016	US 2018355542 A1	13 December 2018
		WO 2017112378 A1	29 June 2017
		EP 3394337 A1	31 October 2018
CN 202323452 U	11 July 2012	None	
JP 2004329536 A	25 November 2004	JP 3808448 B2	09 August 2006
JP 2015057176 A	26 March 2015	JP 5887397 B2	16 March 2016
CN 108060552 A	22 May 2018	None	
CN 207933739 U	02 October 2018	None	
CN 106868800 A	20 June 2017	None	
DE 10355451 A1	23 June 2005	None	

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- CN 201810042671 [0001]