



(11)

EP 4 276 233 A1

(12)

EUROPEAN PATENT APPLICATION
published in accordance with Art. 153(4) EPC

(43) Date of publication:
15.11.2023 Bulletin 2023/46

(51) International Patent Classification (IPC):
D06F 37/26 ^(2006.01)

(21) Application number: **21917273.1**

(52) Cooperative Patent Classification (CPC):
D06F 37/266; D06F 37/26

(22) Date of filing: **20.12.2021**

(86) International application number:
PCT/CN2021/139578

(87) International publication number:
WO 2022/148233 (14.07.2022 Gazette 2022/28)

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

• **Haier Smart Home Co., Ltd.**
Qingdao, Shandong 266101 (CN)

(72) Inventors:
• **ZHAO, Zhiqiang**
Qingdao, Shandong 266101 (CN)
• **XU, Sheng**
Qingdao, Shandong 266101 (CN)

(30) Priority: **08.01.2021 CN 202110022074**

(74) Representative: **Beck & Rössig**
European Patent Attorneys
Cuvilliesstraße 14
81679 München (DE)

(71) Applicants:
• **Qingdao Haier Drum Washing Machine Co., Ltd.**
Shandong 266101 (CN)

(54) **DRUM WASHING MACHINE**

(57) This disclosure discloses a drum washing machine comprising: a housing, with a front panel that has a loading opening; a door, which can be opened and closed, mounted on the loading opening of the front panel; an outer drum, positioned inside the housing, with its opening facing the loading opening; and a sealing decorative plate, securely installed on the opening of the outer drum. When the door is closed, it remains in sealed contact with the sealing decorative plate through a sealing mechanism. This drum washing machine eliminates the conventional method of using window gasket to seal the opening of the outer drum. Instead, by incorporating the sealing decorative plate and maintaining a sealed contact with it through the sealing mechanism when the door is closed, the sealing of the outer drum's opening is achieved. This design prevents the accumulation of dirt on the gasket, a common issue in existing drum washing machines. Furthermore, the sealing decorative plate in this disclosure can also enhance the appearance of the area around the outer drum's opening, resulting in a neater and more aesthetically pleasing design, thus enhancing the user experience.

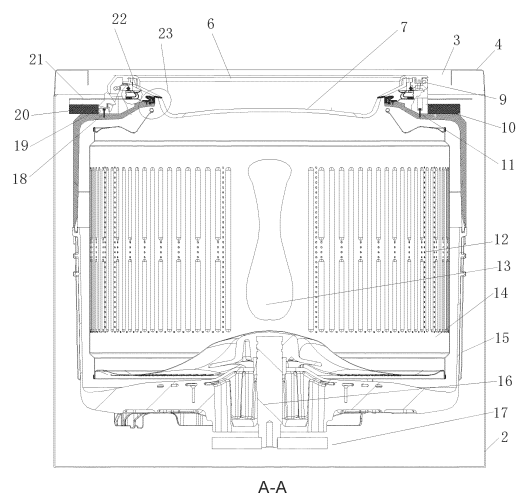


Fig. 2

Description

TECHNICAL FIELD

[0001] The present disclosure relates to the field of washing machines, specifically a drum washing machine.

BACKGROUND

[0002] Washing machines are widely used household appliances that provide great convenience by relieving people of the burden of laundry. Among them, drum washing machines are favored by users due to their advantages such as low wear and tear, good washing effects, and water-saving features.

[0003] Conventional drum washing machines generally consist of a horizontally positioned outer drum and an inner drum. Due to the horizontal arrangement of the outer drum, the opening of the outer drum needs to be sealed during the washing process. Additionally, since the outer drum vibrates during washing, the installation of the outer drum needs to consider shock absorption and cushioning. Therefore, the opening of the outer drum in conventional drum washing machines is connected to the front panel through a window gasket. The window gasket can achieve a sealed connection between the outer drum opening and the front panel, and it also has a corrugated structure for shock absorption and cushioning.

[0004] However, during the washing process, dirty water accumulates inside the window gasket, and dirt particles in the water adhere to the gasket. With prolonged use, the dirt accumulates and becomes more firmly attached to the gasket, leading to secondary pollution of the clothes and posing a serious health threat to users. Moreover, this location is directly visible to users, resulting in a poor user experience.

[0005] In view of this, the present disclosure is proposed.

SUMMARY

[0006] The technical problem addressed by the present disclosure is to overcome the deficiencies of the prior art and provide a drum washing machine that eliminates the issue of dirt accumulation on the window gasket of conventional drum washing machines.

[0007] To solve the above technical problem, the basic idea of the technical solution adopted in the present disclosure is as follows:

A drum washing machine comprising:
a housing, and a loading opening provided at a front panel of the housing;

a door installed on the front panel at the loading opening, capable of opening and closing;
an outer drum set inside the housing, an opening of

the outer drum facing the loading opening;
and a sealing decorative plate fixedly installed on the opening of the outer drum, the door maintaining a sealed contact with the sealing decorative plate via a sealing mechanism when the door is closed.

[0008] Furthermore, the sealing mechanism comprises a first elastic sealing ring set on the opening of the outer drum, and when the door is closed, the first elastic sealing ring maintains a circular sealed contact with an inner wall surface of the door.

[0009] Moreover, the first elastic sealing ring comprises a fitting part and a sealing part, and an outer wall of the opening of the outer drum is provided with a circular sealing groove, the sealing decorative plate is fixedly installed on the outer wall of the opening of the outer drum by a connecting member, and the fitting part is squeezed into the sealing groove, when the door is closed, the sealing part maintains a circular sealed contact with the inner wall surface of the door.

[0010] Furthermore, the sealing decorative plate has a recess, and the recess is provided with an installation hole, and the connecting member passes through the installation hole and is fixed in the recess, the first elastic sealing ring extends into the recess to form a blocking portion for blocking the connecting member.

[0011] Moreover, an edge of the sealing decorative plate has a flange, and the recess is located on an inner side of the flange, the first elastic sealing ring comprises a sleeve part, and the sleeve part has an open groove fitted on the flange, one side wall of the open groove extends horizontally to form the blocking portion, and an other side wall of the open groove extends to form the fitting part and the sealing part.

[0012] Furthermore, the door comprises a door frame and a glass basin installed on the door frame, when the door is closed, the sealing part maintains a circular sealed contact with the glass basin.

[0013] Furthermore, the sealing mechanism comprises a second elastic sealing ring set on the door, and when the door is closed, the second elastic sealing ring maintains a circular sealed contact with an outer surface of the sealing decorative plate.

[0014] Furthermore, the second elastic sealing ring comprises a sealing body, and the sealing body is provided with a hollow elastic deformation cavity.

[0015] Furthermore, the second elastic sealing ring includes a snap buckle integrally formed with the sealing body, and the door has a slot, and the snap buckle is engaged in the slot.

[0016] Furthermore, a magnet is arranged on a side of the second elastic sealing ring in contact with the sealing decorative plate, and when the door is closed, the magnet adheres to the sealing decorative plate, thereby maintaining a circular sealed contact between the second elastic sealing ring and the outer surface of the sealing decorative plate.

[0017] The drum washing machine of the present dis-

closure eliminates the conventional method of sealing the outer drum opening using a window gasket. By setting a sealing decorative plate, the outer drum opening is sealed when the door is closed through the sealing mechanism's contact with the sealing decorative plate, thus eliminating the problem of dirt accumulation on the window gasket of conventional drum washing machines. Additionally, the sealing decorative plate can block the structure at the outer drum opening, making it cleaner and more aesthetically pleasing, thereby enhancing the user experience.

[0018] The following detailed description of specific embodiments of the present disclosure is provided in conjunction with the accompanying drawings.

DESCRIPTION OF THE DRAWINGS

[0019] The drawings, as part of the present disclosure, are provided to further understand the disclosure. The illustrative embodiments and their explanations are used to explain the disclosure but do not constitute inappropriate limitations on the disclosure. It is apparent that the following description and accompanying drawings are merely exemplary embodiments, and those skilled in the art can obtain other embodiments based on these drawings without creative effort.

[0020] In the drawings:

Figure 1 is a schematic diagram of the structure of an embodiment of the drum washing machine of the present disclosure;

Figure 2 is a sectional view taken along line A-A in Figure 1;

Figure 3 is an enlarged assembly view of the first elastic sealing ring in an embodiment of the present disclosure;

Figure 4 is an enlarged assembly view of the second elastic sealing ring in an embodiment of the present disclosure.

Explanation of the Reference Numerals in the Drawings:

[0021] 1. Control panel; 2. Housing; 3. Loading opening; 4. Front panel; 5. Base foot; 6. Door; 7. Glass basin; 8. Detergent dispenser; 9. Shaft; 10. Shaft seat; 11. Shaft seat screw; 12. Drainage hole; 13. Ribs; 14. Inner drum; 15. Outer drum; 16. Drive shaft; 17. Drive motor; 18. Lock seat screw; 19. Lock seat; 20. Front counterweight ring of the outer drum; 21. Sealing decorative plate; 22. Second elastic sealing ring; 23. First elastic sealing ring; 24. Blocking portion; 25. Sleeve part; 26. Flange; 27. Sealing part; 28. Fitting part; 29. Sealing groove; 30. Connecting member; 31. Recess; 32. Snap buckle; 33. Sealing body; 34. Magnet.

[0022] It should be noted that the drawings and the accompanying description are not intended to limit the scope of the present disclosure in any way but to explain the concept of the present disclosure to those skilled in

the art with reference to specific embodiments.

DETAILED DESCRIPTION

[0023] To make the objectives, technical solutions, and advantages of the embodiments of the present disclosure clearer, the technical solutions in the embodiments will be described clearly and completely in conjunction with the accompanying drawings of the embodiments. The following embodiments are provided to illustrate the present disclosure and should not be construed as limiting the scope of the disclosure.

[0024] In the description of the present disclosure, it should be noted that terms such as "up," "down," "front," "rear," "left," "right," "vertical," "horizontal," "inside," and "outside" indicate the positional relationship or orientation based on the orientation or positional relationship shown in the drawings. They are used for the purpose of facilitating the description of the present disclosure and simplifying the description, and should not be understood as indicating or implying that the devices or components referred to must have a specific orientation, be constructed in a specific orientation, or operate in a specific orientation. Therefore, they should not be construed as limiting the present disclosure.

[0025] In the description of the present disclosure, it should be noted that unless otherwise explicitly specified and limited, the terms "installation," "connection," and "attachment" should be broadly interpreted. For example, they can refer to fixed connections, detachable connections, or integral connections; they can refer to mechanical connections or electrical connections; they can refer to direct connections or indirect connections through intermediate media. Those skilled in the art can understand the specific meanings of the above terms in the present disclosure based on the specific circumstances.

[0026] The present disclosure will be further described in detail below

[0027] As shown in Figures 1 to 4, the present disclosure provides a drum washing machine comprising:

a housing 2, and a front panel 4 of the housing 2 is provided with a loading opening 3; a door 6, which is openable and closable, installed on the front panel 4 at the loading opening 3;

an outer drum 15, located inside the housing 2, an opening of the outer drum 15 facing the loading opening 3; and

a sealing decorative plate 21, fixedly installed on the opening of the outer drum 15, and when the door 6 is closed, the door 6 maintains a sealed contact with the sealing decorative plate 21 via a sealing mechanism.

[0028] In this embodiment, the drum washing machine eliminates the conventional window seal connected to the opening of the outer drum, and instead installs the sealing decorative plate 21 to achieve sealing of the outer

drum's opening by sealing contact between the door 6 and the sealing decorative plate 21 via the sealing mechanism when the door 6 is closed, effectively eliminating the accumulation of dirt on the window seal. Furthermore, the sealing decorative plate in this embodiment can block the structure at the opening of the outer drum, making the opening of the outer drum cleaner and more aesthetically pleasing, thus improving the user experience.

[0029] As shown in Figures 2 and 3, to achieve a sealed contact between the door 6 and the opening of the outer drum 15, in one embodiment, the sealing mechanism includes a first elastic sealing ring 23 installed on the opening of the outer drum 15. When the door 6 is closed, the first elastic sealing ring 23 maintains a circular sealed contact with the inner wall of the door 6. The first elastic sealing ring 23 directly contacts the inner wall of the door 6 to achieve the sealing of the opening of the outer drum 15 by the door 6. The structure of the first elastic sealing ring 23 is simpler compared to the window seal, it is less prone to dirt accumulation, and the sealing effect is increased by the compression between the door 6 and the opening of the outer drum 15 when the door is closed.

[0030] Furthermore, the first elastic sealing ring 23 in this embodiment includes a fitting part 28 and a sealing part 27. The outer wall of the opening of the outer drum 15 has a circular sealing groove 29. The sealing decorative plate 21 is fixedly installed on the outer wall of the opening of the outer drum 15 through the connecting member 30, and the fitting part 28 is compressed into the sealing groove 29. When the door 6 is closed, the sealing part 27 maintains a circular sealed contact with the inner wall of the door 6.

[0031] During the installation of the sealing decorative plate 21 in this embodiment, the fitting part 28 of the first elastic sealing ring 23 is compressed into the sealing groove 29, facilitating the installation of the first elastic sealing ring 23 and the assembly method is simple and reliable. The sealing groove 29 is located on the back of the sealing decorative plate 21 corresponding to the edge of the opening of the outer drum 15. The fitting part 28 is a circular elastic body that is compressed into the sealing groove 29 during the installation of the sealing decorative plate 21.

[0032] Additionally, the sealing decorative plate 21 in this embodiment has a recess 31 with installation holes, and the connecting member 30 pass through the installation holes and are fixed in the recess 31. The first elastic sealing ring 23 extends into the recess 31 to form a blocking portion 24 that blocks the connecting member 30. After the installation of the connecting members 30, the blocking portion 24 recovers its elastic deformation, covering the connecting members 30 and the recess 31, achieving a visually clean appearance.

[0033] Preferably, the connecting members 30 in this embodiment can be fastening screws.

[0034] Furthermore, the edge of the sealing decorative plate 21 in this embodiment has a flange 26, and the recess 31 is located on the inner side of the flange 26.

The first elastic sealing ring 23 includes a sleeve part 25, which has an open groove fitted on the flange 26. One side wall of the open groove horizontally extends to form the blocking portion 24, and the other side wall of the open groove extends to form the fitting part 28 and the sealing part 27 respectively. The flange 26 on the edge of the sealing decorative plate 21 increases the overall strength of the sealing decorative plate 21 and prevents deformation when the outer drum 15 vibrates. It also prevents users getting hurt from coming into contact with the flange 26 by wrapping the first elastic ring 23 around the flange 26, while enhancing the overall aesthetics of the sealing decorative plate 21.

[0035] Furthermore, the door 6 in this embodiment includes a door frame and a glass basin 7 installed on the door frame. When the door 6 is closed, the sealing part 27 maintains a circular sealed contact with the glass basin 7.

[0036] From the above, it can be seen that the drum washing machine of this embodiment eliminates the window pad. The installation of the first elastic sealing ring 23 is achieved by installing a sealing decorative plate at the opening of the outer drum. The first elastic sealing ring 23 maintains a sealed contact with the machine door 6 when it is closed, achieving a sealed connection between the machine door 6 and the opening of the outer drum. At the same time, in order to further increase the seal between the machine door 6 and the sealing decorative plate 21, and enhance its effectiveness, as shown in Figures 2 and 4, this embodiment includes a sealing mechanism comprising a second elastic sealing ring 22 installed on the machine door 6. When the door 6 closed, there is an annular seal contact between second elastic sealing ring 22 and outer surface of sealing decorative plate 21.

[0037] Furthermore, the second elastic sealing ring 22 includes a sealing body 33, and the sealing body 33 has a hollow elastic deformation cavity. In this way, when the door 6 is closed, the sealing body 33 is compressed to maintain elastic deformation and seal contact. Preferably, in this embodiment, the sealing body 33 has multiple separate elastic deformation cavities to increase the range of elastic deformation and ensure sealing effectiveness.

[0038] The second elastic sealing ring 22 described in this embodiment includes a snap buckle 32 integrally formed with the sealing body 33. The door 6 has a slot, and the snap buckle 32 is engaged in the slot to achieve the installation of the second elastic sealing ring 22 on the door 6.

[0039] Furthermore, one side of the second elastic sealing ring 22 described in this embodiment that contacts with the sealing decorative plate 21 is provided with a magnet 34. When the door 6 is closed, the magnet 34 adheres to the sealing decorative plate 21, maintaining annular sealed contact between the outer surface of the second elastic sealing ring 22 and sealing decorative plate 21. The sealing decorative plate in this embodiment

is made of metal material, and a magnet 34 is provided on the second elastic sealing ring 22 for keeping the door 6 closed by the magnet 34 adhering to the sealing decorative plate 21, and increasing sealing effect between door 6 and second elastic sealing ring 22.

[0040] The glass basin inside the inner ring of door 6 in this embodiment is sealed by the first elastic sealing ring 23 to maintain contact with the opening of outer drum 15 for sealing. The door frame outside the outer ring of the door is sealed by the second elastic sealing ring 22 to maintain contact with the sealing decorative plate 21 for sealing. In this way, when door 6 is closed, at least two seals are formed from inside to outside between the opening of outer drum 15 and door 6, ensuring a seal effect of door 6 on the opening of outer drum 15 and avoiding water leakage.

[0041] As shown in Figure 2, the door 6 in this embodiment is rotatably installed on the front panel 4 of the housing 2. A shaft seat 10 is installed on the front panel at the side of the loading opening 3 by a shaft seat screw 11. One side of the door 6 is equipped with a shaft 9, and the shaft 9 is rotatably mounted on the shaft seat 10, allowing the door 6 to be rotatably installed on the front panel 4.

[0042] On the front panel located opposite to the loading opening 3 and the shaft seat 10, a lock seat 19 is fixedly installed using a lock seat screw 18. One side of the door 6 corresponding to the shaft 9 is equipped with a lock hook.

[0043] The second elastic sealing ring 22 in this embodiment is positioned corresponding to the shaft 9 and lock hook. This allows the second elastic sealing ring 22 to better contact and seal when the door 6 is closed and locked.

[0044] In one embodiment, a front counterweight ring of the outer drum 20 is installed on the opening of the outer drum 15, and the sealing decorative plate 21 blocks the front counterweight ring of the outer drum 20.

[0045] Inside the outer drum 15 of this embodiment, an inner drum 14 is installed. Ribs 13 are attached to the inner wall of the inner drum 14 to lift the clothing. The drum wall of the inner drum 14 has drainage holes 12. At the bottom of the outer drum 15, a drive motor 17 is installed, the drive motor 17 is connected to the inner drum 14 through a drive shaft 16, driving the rotation of the inner drum 14.

[0046] On the upper part of the housing 2, a control panel 1 and a detergent dispenser 8 are installed. The housing 2 is mounted with base feet 5 at the bottom.

[0047] The above description is merely an exemplary embodiment of the present disclosure and does not limit the present disclosure in any form. Although the present disclosure has been disclosed in the exemplary embodiment, it should be understood that any simple modification, equivalent change, or modification made to the above embodiments based on the technical essence of the present disclosure by those skilled in the art without departing from the technical scope of the present disclo-

sure is still within the scope of the present disclosure.

Claims

1. A drum washing machine, **characterized by** comprising:
 - a housing, and a loading opening provided at a front panel of the housing;
 - a door installed on the front panel at the loading opening, capable of opening and closing;
 - an outer drum set inside the housing, an opening of the outer drum facing the loading opening;
 - and a sealing decorative plate fixedly installed on the opening of the outer drum, the door maintaining a sealed contact with the sealing decorative plate via a sealing mechanism when the door is closed.
2. The drum washing machine according to claim 1, **characterized in that** the sealing mechanism comprises a first elastic sealing ring set on the opening of the outer drum, and when the door is closed, the first elastic sealing ring maintains a circular sealed contact with an inner wall surface of the door.
3. The drum washing machine according to claim 2, **characterized in that** the first elastic sealing ring comprises a fitting part and a sealing part, and an outer wall of the opening of the outer drum is provided with a circular sealing groove, the sealing decorative plate is fixedly installed on the outer wall of the opening of the outer drum by a connecting member, and the fitting part is squeezed into the sealing groove, when the door is closed, the sealing part maintains a circular sealed contact with the inner wall surface of the door.
4. The drum washing machine according to claim 3, **characterized in that** the sealing decorative plate has a recess, and the recess is provided with an installation hole, and the connecting member passes through the installation hole and is fixed in the recess, the first elastic sealing ring extends into the recess to form a blocking portion for blocking the connecting member.
5. The drum washing machine according to claim 4, **characterized in that** an edge of the sealing decorative plate has a flange, and the recess is located on an inner side of the flange, the first elastic sealing ring comprises a sleeve part, and the sleeve part has an open groove fitted on the flange, one side wall of the open groove extends horizontally to form the blocking portion, and an other side wall of the open groove extends to form the fitting part and the sealing part.

6. The drum washing machine according to claim 3, **characterized in that** the door comprises a door frame and a glass basin installed on the door frame, when the door is closed, the sealing part maintains a circular sealed contact with the glass basin. 5
7. The drum washing machine according to claim 1, **characterized in that** the sealing mechanism comprises a second elastic sealing ring set on the door, and when the door is closed, the second elastic sealing ring maintains a circular sealed contact with an outer surface of the sealing decorative plate. 10
8. The drum washing machine according to claim 7, **characterized in that** the second elastic sealing ring comprises a sealing body, and the sealing body is provided with a hollow elastic deformation cavity. 15
9. The drum washing machine according to claim 8, **characterized in that** the second elastic sealing ring includes a snap buckle integrally formed with the sealing body, and the door has a slot, and the snap buckle is engaged in the slot. 20
10. The drum washing machine according to any one of claims 7 to 9, **characterized in that** a magnet is arranged on a side of the second elastic sealing ring in contact with the sealing decorative plate, and when the door is closed, the magnet adheres to the sealing decorative plate, thereby maintaining a circular sealed contact between the second elastic sealing ring and the outer surface of the sealing decorative plate. 25 30

35

40

45

50

55

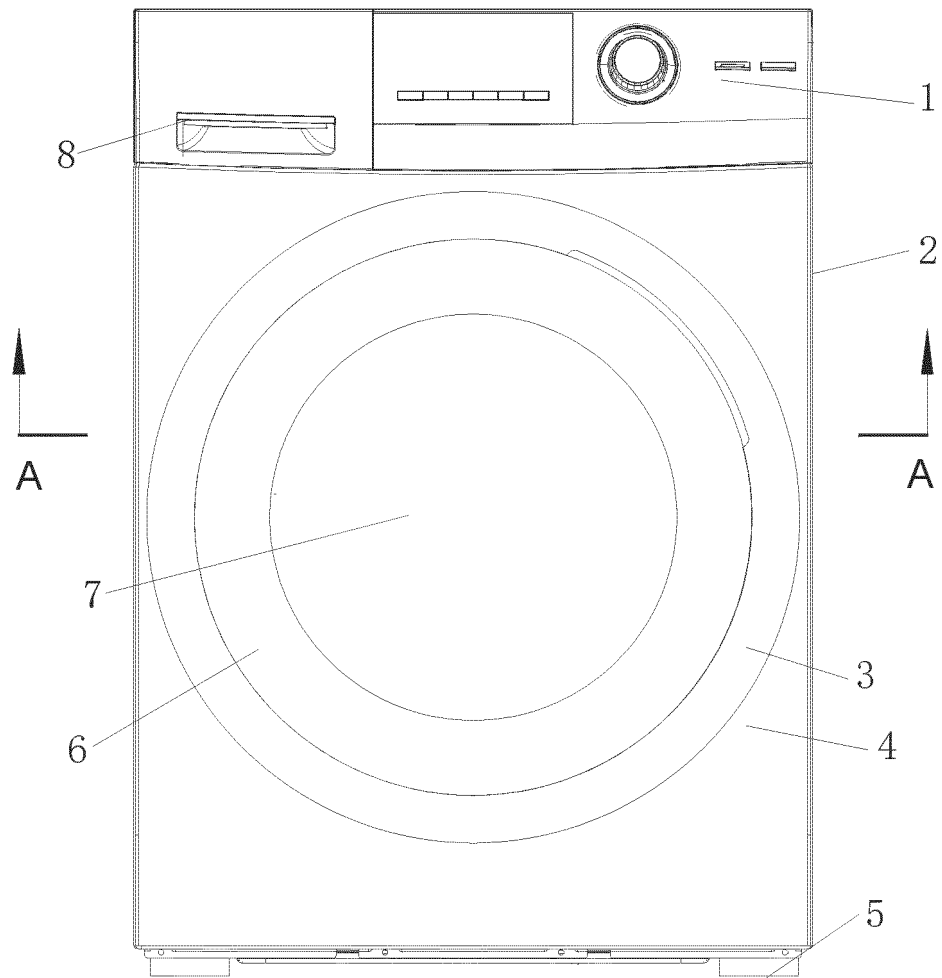
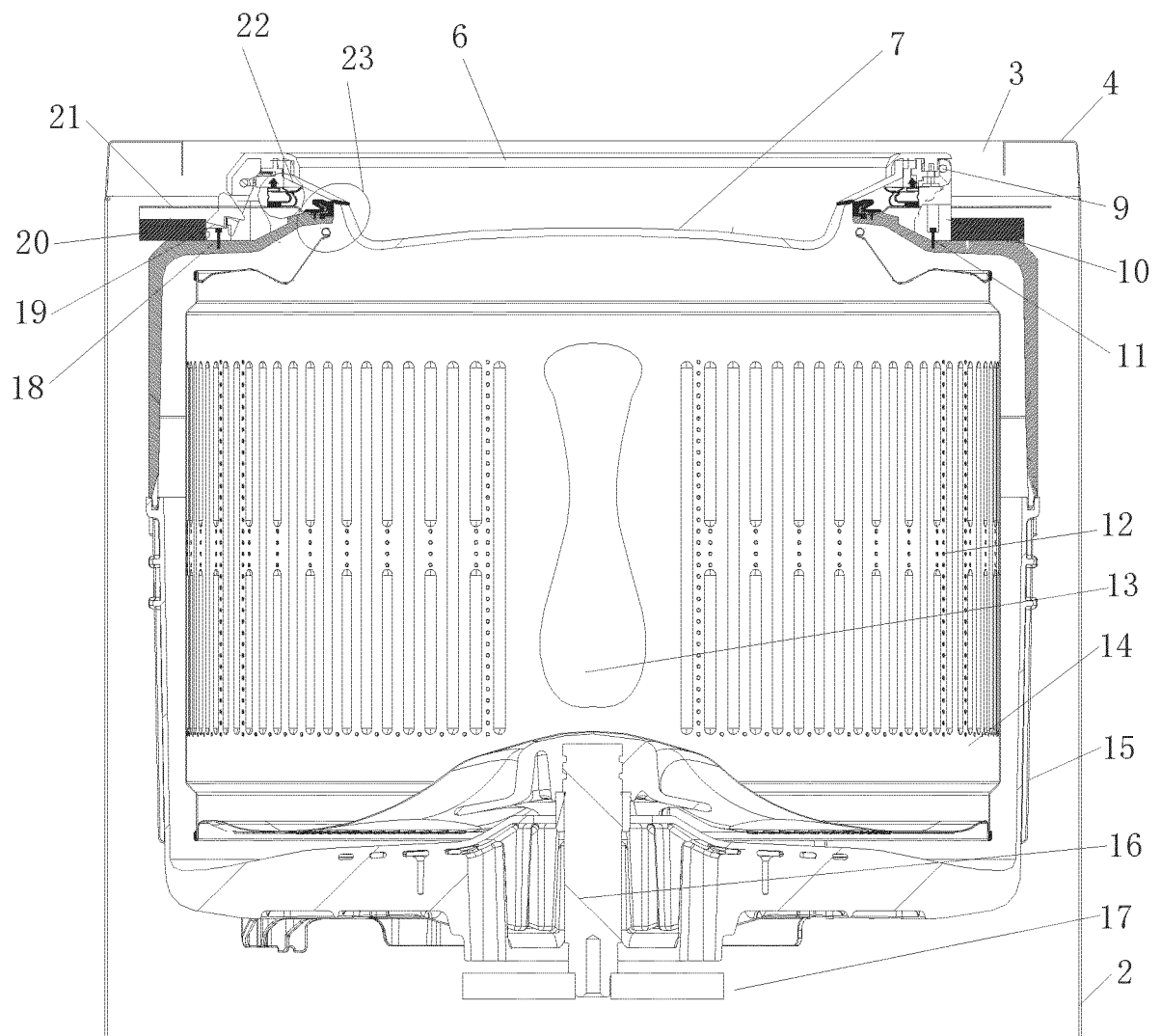


Fig. 1



A-A

Fig. 2

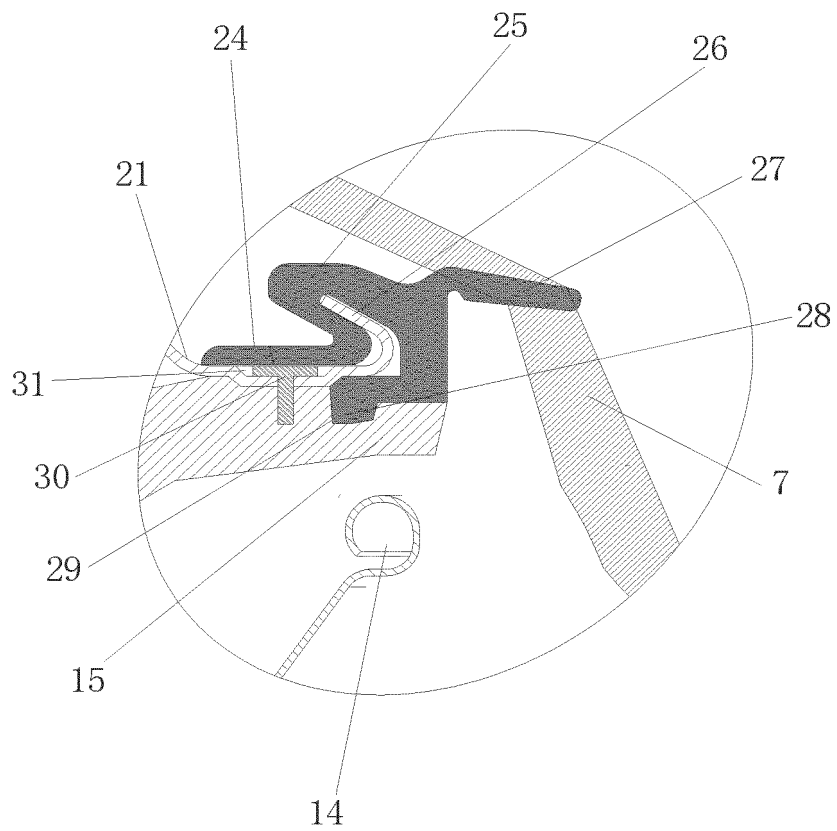


Fig. 3

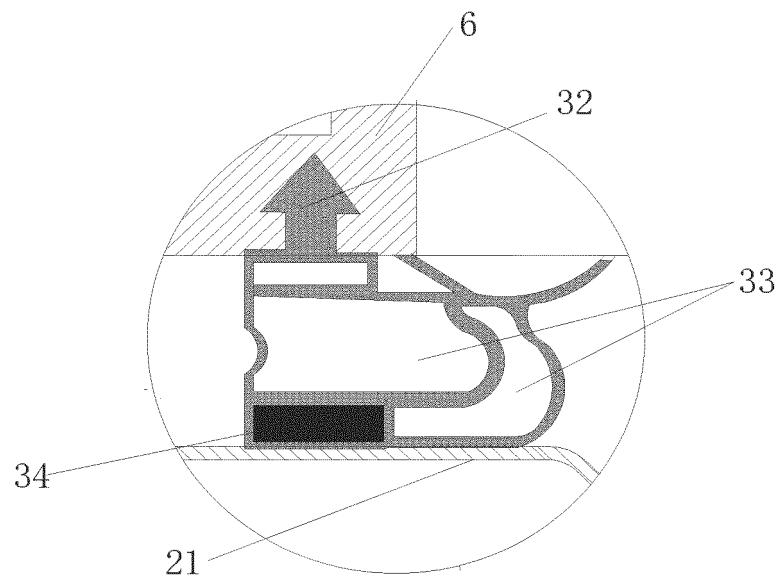


Fig. 4

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2021/139578

A. CLASSIFICATION OF SUBJECT MATTER D06F 37/26(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) D06F																					
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched																					
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) WPI; EPODOC; CNPAT; CNKI; 海尔, 滚筒, 转筒, 洗衣机, 密封, 衬垫, 窗, 污染, 脏, wash+, laundry+, cover+, door, lip+, drum, cabinet, gasket, bellow?, seal+.																					
C. DOCUMENTS CONSIDERED TO BE RELEVANT																					
<table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>X</td> <td>CN 110872780 A (WUXI LITTLE SWAN ELECTRICAL APPLIANCE CO., LTD.; MIDEA GROUP CO., LTD. et al.) 10 March 2020 (2020-03-10) description, paragraphs 60-137, figures 1-19</td> <td>1, 7-10</td> </tr> <tr> <td>Y</td> <td>CN 110872780 A (WUXI LITTLE SWAN ELECTRICAL APPLIANCE CO., LTD.; MIDEA GROUP CO., LTD. et al.) 10 March 2020 (2020-03-10) description, paragraphs 60-137, figures 1-19</td> <td>2-6</td> </tr> <tr> <td>Y</td> <td>KR 20060065939 A (LG ELECTRONICS INC.) 15 June 2006 (2006-06-15) description page 2 last paragraph - page 5 last paragraph, figures 2-4</td> <td>2-6</td> </tr> <tr> <td>A</td> <td>CN 104342880 A (SUZHOU SAMSUNNG ELECTRONICS CO., LTD. et al.) 11 February 2015 (2015-02-11) entire document</td> <td>1-10</td> </tr> <tr> <td>A</td> <td>CN 108691161 A (QINGDAO HAIER DRUM WASHING MACHINE CO., LTD.) 23 October 2018 (2018-10-23) entire document</td> <td>1-10</td> </tr> <tr> <td>A</td> <td>JP 2014090778 A (PANASONIC CORP.) 19 May 2014 (2014-05-19) entire document</td> <td>1-10</td> </tr> </tbody> </table>	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	X	CN 110872780 A (WUXI LITTLE SWAN ELECTRICAL APPLIANCE CO., LTD.; MIDEA GROUP CO., LTD. et al.) 10 March 2020 (2020-03-10) description, paragraphs 60-137, figures 1-19	1, 7-10	Y	CN 110872780 A (WUXI LITTLE SWAN ELECTRICAL APPLIANCE CO., LTD.; MIDEA GROUP CO., LTD. et al.) 10 March 2020 (2020-03-10) description, paragraphs 60-137, figures 1-19	2-6	Y	KR 20060065939 A (LG ELECTRONICS INC.) 15 June 2006 (2006-06-15) description page 2 last paragraph - page 5 last paragraph, figures 2-4	2-6	A	CN 104342880 A (SUZHOU SAMSUNNG ELECTRONICS CO., LTD. et al.) 11 February 2015 (2015-02-11) entire document	1-10	A	CN 108691161 A (QINGDAO HAIER DRUM WASHING MACHINE CO., LTD.) 23 October 2018 (2018-10-23) entire document	1-10	A	JP 2014090778 A (PANASONIC CORP.) 19 May 2014 (2014-05-19) entire document	1-10
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.																			
X	CN 110872780 A (WUXI LITTLE SWAN ELECTRICAL APPLIANCE CO., LTD.; MIDEA GROUP CO., LTD. et al.) 10 March 2020 (2020-03-10) description, paragraphs 60-137, figures 1-19	1, 7-10																			
Y	CN 110872780 A (WUXI LITTLE SWAN ELECTRICAL APPLIANCE CO., LTD.; MIDEA GROUP CO., LTD. et al.) 10 March 2020 (2020-03-10) description, paragraphs 60-137, figures 1-19	2-6																			
Y	KR 20060065939 A (LG ELECTRONICS INC.) 15 June 2006 (2006-06-15) description page 2 last paragraph - page 5 last paragraph, figures 2-4	2-6																			
A	CN 104342880 A (SUZHOU SAMSUNNG ELECTRONICS CO., LTD. et al.) 11 February 2015 (2015-02-11) entire document	1-10																			
A	CN 108691161 A (QINGDAO HAIER DRUM WASHING MACHINE CO., LTD.) 23 October 2018 (2018-10-23) entire document	1-10																			
A	JP 2014090778 A (PANASONIC CORP.) 19 May 2014 (2014-05-19) entire document	1-10																			
☐ Further documents are listed in the continuation of Box C.	☒ See patent family annex.																				
* 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	“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 22 February 2022	Date of mailing of the international search report 15 March 2022																				
Name and mailing address of the ISA/CN China National Intellectual Property Administration (ISA/CN) No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088, China Facsimile No. (86-10)62019451	Authorized officer Telephone No.																				

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2021/139578

5

10

15

20

25

30

35

40

45

50

55

Patent document cited in search report				Publication date (day/month/year)		Patent family member(s)		Publication date (day/month/year)	
CN	110872780	A		10 March 2020		CN	209958106	U	17 January 2020
						CN	110872781	A	10 March 2020
						CN	110872779	A	10 March 2020
						CN	209958105	U	17 January 2020
KR	20060065939	A		15 June 2006		KR	100672409	B1	24 January 2007
CN	104342880	A		11 February 2015		CN	104342880	B	07 September 2016
CN	108691161	A		23 October 2018		None			
JP	2014090778	A		19 May 2014		None			