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(54) **DETERGENT BOX AND WASHING MACHINE COMPRISING SAME**

(57) Provided are a detergent box and a washing machine including the detergent box. The detergent box includes an additive box provided with an addition cavity, and further includes a siphon structure and a limit plate. The siphon structure is rotatably disposed in the addition cavity and is configured to divide the addition cavity into

two chambers, and the two chambers are communicated through the siphon structure when liquid detergent is delivered. The limit plate is configured to support the siphon structure to enable the two chambers to be completely communicated when solid detergent is delivered.

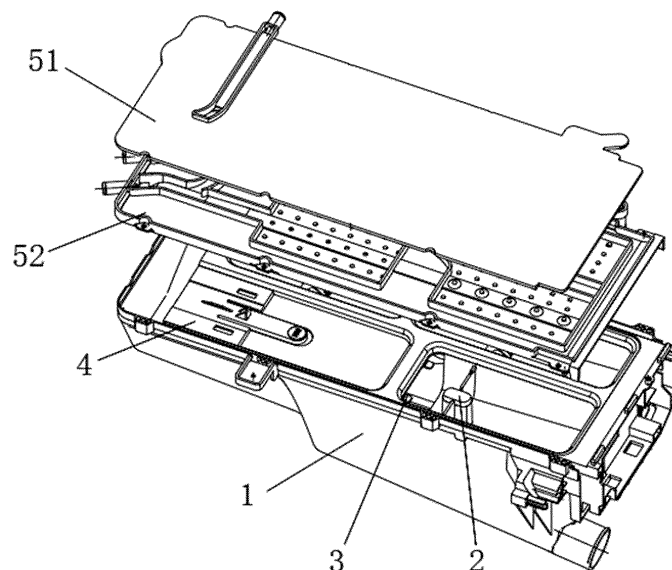


FIG. 1

Description

[0001] This application claims priority to Chinese Patent Application No. 201811245848.5 filed Oct. 24, 2018, the disclosure of which is incorporated herein by reference in its entirety.

TECHNICAL FIELD

[0002] The present disclosure relates to the field of washing machines, for example, to a detergent box and a washing machine including the detergent box.

BACKGROUND

[0003] Washing powder is a solid-powder structure. Detergent, softener, disinfectant and the like are liquids. In the related art, a siphon structure is generally adopted by a detergent box to deliver liquid additives, and a mode of direct rinsing with water flow is adopted to deliver solid additives such as the washing powder and the like. As a result, a detergent box in the related art is provided with a washing-powder-delivery chamber, a detergent delivery chamber and a softener delivery chamber, and some detergent boxes are further provided with a disinfectant delivery chamber. The detergent box of the above structure has disadvantages such as having a large volume, occupying a large mounting space and having a complex structure.

SUMMARY

[0004] The present disclosure provides a detergent box and a washing machine including the detergent box, so that problems of a detergent box in the related art such as having a large volume, occupying a large mounting space and having a complex structure are solved.

[0005] An embodiment provides a detergent box. The detergent box includes an additive box provided with an addition cavity, and further includes a siphon structure and a limit plate. The siphon structure is rotatably disposed in the addition cavity and is configured to divide the addition cavity into two chambers, and the two chambers are communicated through the siphon structure when liquid detergent is delivered. The limit plate is configured to support the siphon structure to enable the two chambers to be completely communicated when solid detergent is delivered.

[0006] An embodiment provides a washing machine. The washing machine includes a washing machine body and the detergent box described above, where the detergent box is configured to be drawn horizontally and is disposed on the washing machine body.

BRIEF DESCRIPTION OF DRAWINGS

[0007]

FIG. 1 is an exploded view of a detergent box (which has an upper lid and a lower lid) according to an embodiment;

FIG. 2 is a schematic view of a siphon structure according to an embodiment;

FIG. 3 is a sectional view of a detergent box according to an embodiment;

FIG. 4 is a view showing a state when a detergent box is configured to deliver liquid detergent; and

FIG. 5 is a view showing a state when a detergent box is configured to deliver solid detergent.

Reference list

[0008]

- | | |
|-----|------------------|
| 1 | additive box |
| 11 | addition cavity |
| 12 | bottom wall |
| 13 | water outlet |
| 2 | siphon structure |
| 21 | siphon cap |
| 211 | cap body |
| 212 | division plate |
| 22 | partition dam |
| 3 | limit plate |
| 4 | box lid |
| 51 | upper lid |
| 52 | lower lid |

DETAILED DESCRIPTION

[0009] As shown in FIGS. 1 to 5, an embodiment provides a detergent box. The detergent box includes an additive box 1 provided with an addition cavity 11 and a siphon structure 2 rotatably disposed in the addition cavity 11. As shown in FIG. 2, the siphon structure 2 includes a siphon cap 21 and partition dams 22 respectively disposed on two sides of the siphon cap 21, and two partition dams 22 are respectively rotatably connected to two opposite inner walls of the addition cavity 11. In an embodiment, each partition dam 22 and the siphon cap 21 are welded integrally. In other embodiments, the siphon cap 21 may further be directly rotatably connected to an inner wall of the addition cavity 11. Alternatively, a siphon cap 21 is set, a partition dam 22 is disposed on a first side of the siphon cap 21, and a second side of the siphon cap 21 and the partition dam 22 are respectively rotatably connected to the two opposite inner walls of the addition cavity 11.

[0010] As shown in FIGS. 1 and 3, the detergent box further includes a box lid 4. Limit plates 3 are disposed on the box lid 4. In the embodiment, two limit plates 3 are set. The additive box 1 is provided with a water outlet 13

communicated with the addition cavity 11, and the limit plates 3 and the water outlet 13 are disposed on the same side of the additive box 1. The limit plate 3 and the water outlet 13 may further be respectively disposed on two sides of the siphon structure 2, and in this configuration, the limit plate 3 may be disposed on the inner wall of the addition cavity 11.

[0011] Referring to FIG. 4, when liquid detergent is delivered, the siphon structure 2 described above is vertically disposed and divides the addition cavity 11 into two chambers, and the two chambers can be communicated through the siphon structure 2 when the liquid detergent such as detergent or softener is delivered. As shown in FIG. 5, when solid detergent such as washing powder is delivered, a user may manually rotate the siphon structure 2, for example, clockwise rotate the siphon structure 2 so as to rotate the siphon structure 2 to a horizontal position. At this time, the limit plate 3 restricts the siphon structure 2 from continuing to rotate, and the siphon structure 2 is supported by the limit plate 3 so that the limit plate 3 is kept in the horizontal position, and thus the two chambers are completely communicated.

[0012] Referring to FIG. 3, the siphon cap 21 includes a cap body 211, and a division plate 212 is disposed in the cap body 211. The division plate 212 divides an inner cavity of the cap body 211 into two siphon cavities communicated with each other, and each one of the two siphon cavities is communicated with a respective one of the two cavities. The siphon structure 2 is used when liquid detergent is delivered.

[0013] In order to prevent water from remaining in the addition cavity 11, a bottom wall 12 of the addition cavity 11 is disposed at a non-zero angle from a horizontal direction, and a first side of the bottom wall 12 close to the water outlet 13 is lower than a second side of the bottom wall 12 away from the water outlet 13, so that water droplets remaining on the bottom wall 12 can slide down along the bottom wall 12 to the water outlet 13 under the action of gravity.

[0014] Since the siphon structure 2 described above is to be clockwise rotated, in order to prevent the bottom wall 12 from limiting the rotation of the siphon structure 2, a space is provided between a lower end surface of the siphon structure 2 and the bottom wall 12. In an embodiment, lower end surfaces of the division plate 212 are located above the bottom wall 12, and in order to ensure that the siphon structure 2 operates normally, a lower end surface of the cap body 211 is located above the lower end surfaces of the division plate 212. The size of the space is determined according to the angle of inclination of the bottom wall 12 relative to a horizontal plane and according to the height of the siphon cap 21.

[0015] Compared with the related art in which different addition cavities 11 are adopted to respectively deliver detergent in different forms, in the detergent box described above, liquid detergent and solid detergent are delivered through the same addition cavity 11, so that the volume of the detergent box is reduced, the occupied

mounting space is small, the processing cost is reduced, and the structure of the detergent box is simplified.

[0016] The embodiment further provides a washing machine. The washing machine includes a washing machine body and the detergent box described above capable of being drawn horizontally relative to the washing machine body. Referring to FIG. 1, a lower lid 52 is disposed above the detergent box. An upper lid 51 which is connected, by depositing, with the lower lid 52 is disposed above the lower lid 52. A water flow channel is formed between the upper lid 51 and the lower lid 52. Multiple through holes are provided in a position of the lower lid 52 right opposite to the addition cavity 11, and the multiple through holes are disposed to allow washing water to pass through.

[0017] For the washing machine including the detergent box described above, detergent in different forms may be delivered through one addition cavity, so that the washing machine has the advantages of a small volume and a low processing cost.

Claims

1. A detergent box, comprising an additive box (1) provided with an addition cavity (11), and further comprising:
 - a siphon structure (2), wherein the siphon structure (2) is rotatably disposed in the addition cavity (11) and is configured to divide the addition cavity (11) into two chambers, and the two chambers are communicated through the siphon structure (2) when liquid detergent is delivered; and
 - a limit plate (3), wherein the limit plate (3) is configured to support the siphon structure (2) to enable the two chambers to be completely communicated when solid detergent is delivered.
2. The detergent box according to claim 1, wherein the siphon structure (2) comprises a siphon cap (21), and the siphon cap (21) comprises a cap body (211) and a division plate (212) disposed in the cap body (211), wherein the division plate (212) divides an inner cavity of the cap body (211) into two siphon cavities communicated with each other, and each one of the two siphon cavities is communicated with a respective one of the two cavities.
3. The detergent box according to claim 2, wherein the siphon cap (21) is rotatably connected to an inner wall of the addition cavity (11).
4. The detergent box according to claim 2, wherein the siphon structure (2) further comprises two partition dams (22), wherein the two partition dams (22) are respectively disposed on two sides of the siphon cap

(21), and each of the two partition dams (22) are rotatably connected to an inner wall of the addition cavity (11).

5. The detergent box according to claim 4, wherein the two partition dams (22) and the siphon cap (21) are welded integrally. 5
6. The detergent box according to claim 1, wherein the additive box (1) is provided with a water outlet (13) communicated with the addition cavity (11), a bottom wall (12) of the addition cavity (11) is disposed at a non-zero angle from a horizontal direction, and a first side of the bottom wall (12) close to the water outlet (13) is lower than a second side of the bottom wall (12) away from the water outlet (13). 10 15
7. The detergent box according to claim 6, wherein a space is provided between the bottom wall (12) and a lower end surface of the siphon structure (2). 20
8. The detergent box according to claim 6, further comprising a box lid (4), wherein the box lid is configured to be buckled into the additive box (1). 25
9. The detergent box according to claim 8, wherein the limit plate (3) is disposed on the box lid (4), and the limit plate (3) and the water outlet (13) are disposed on a same side of the additive box (1). 30
10. A washing machine, comprising a washing machine body and the detergent box according to any one of claims 1 to 9, wherein the detergent box is configured to be drawn horizontally and is disposed on the washing machine body. 35

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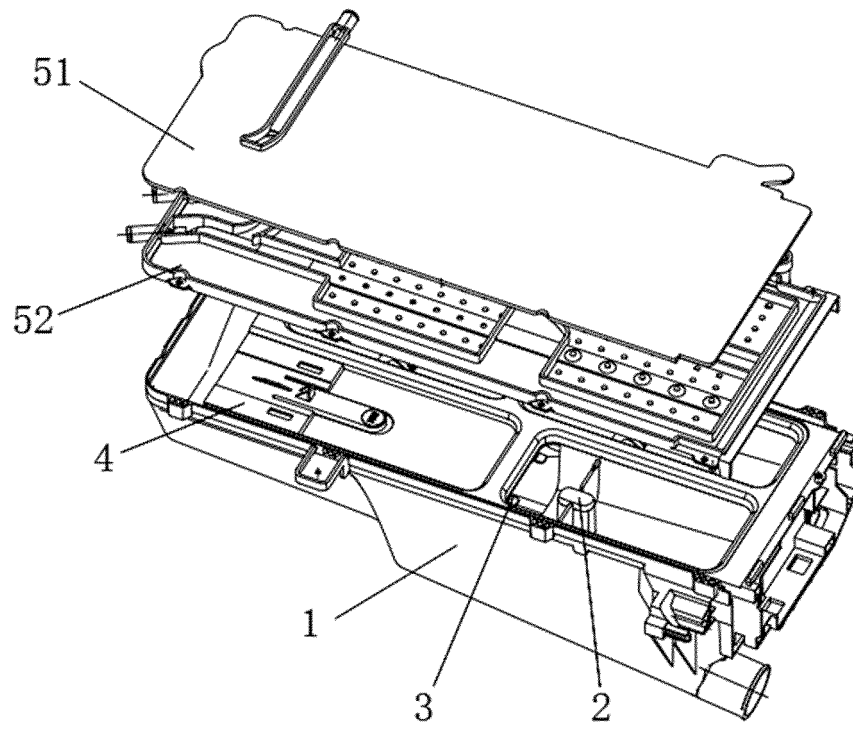


FIG. 1

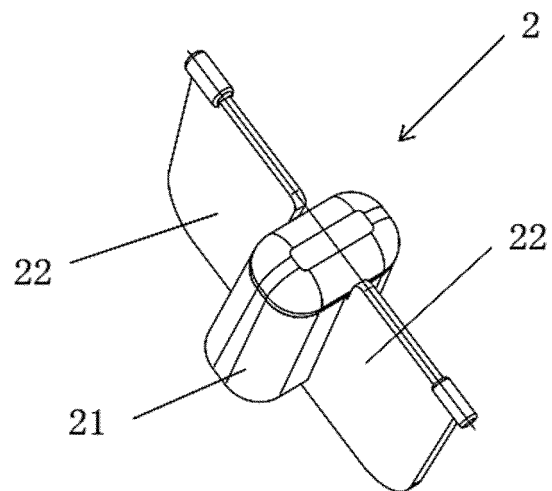


FIG. 2

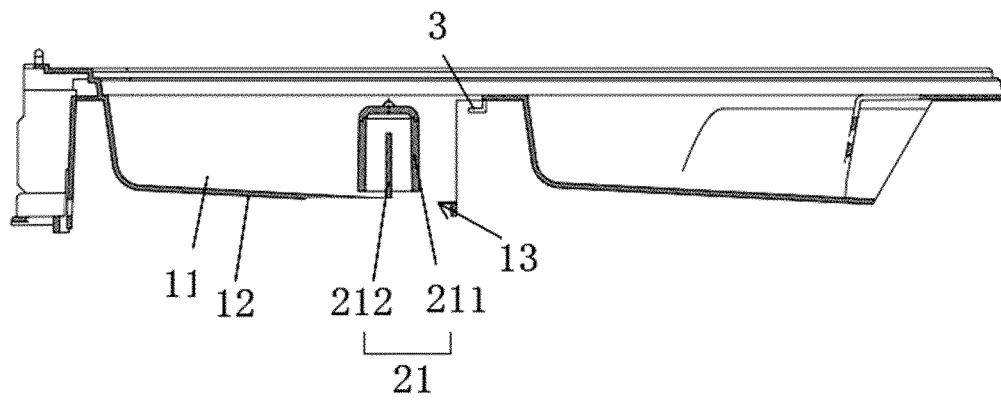


FIG. 3

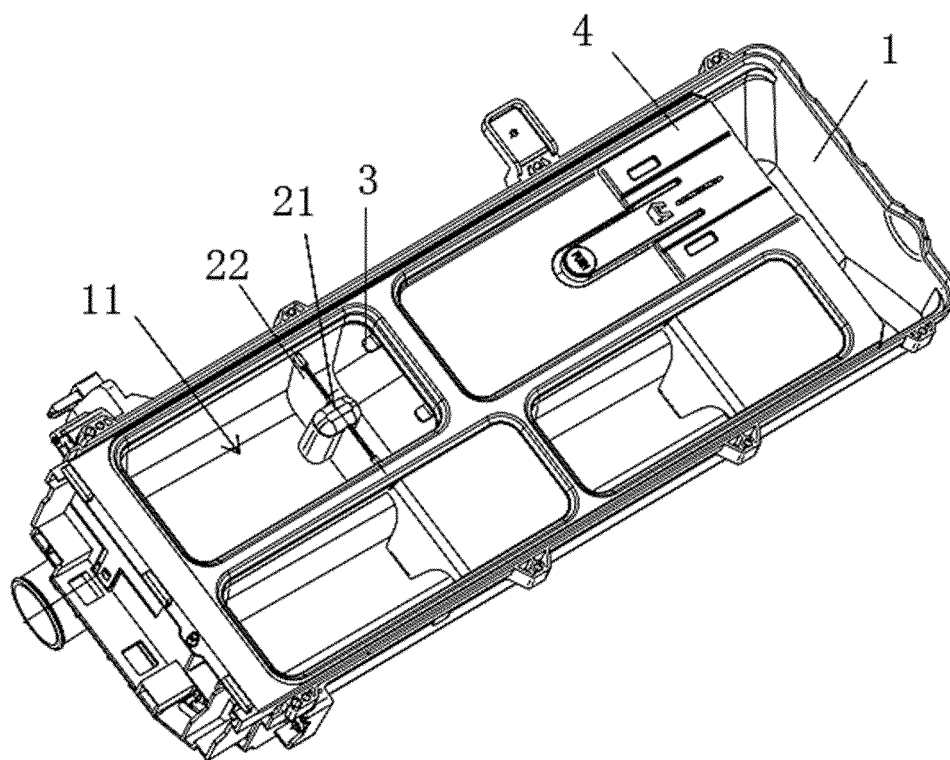


FIG. 4

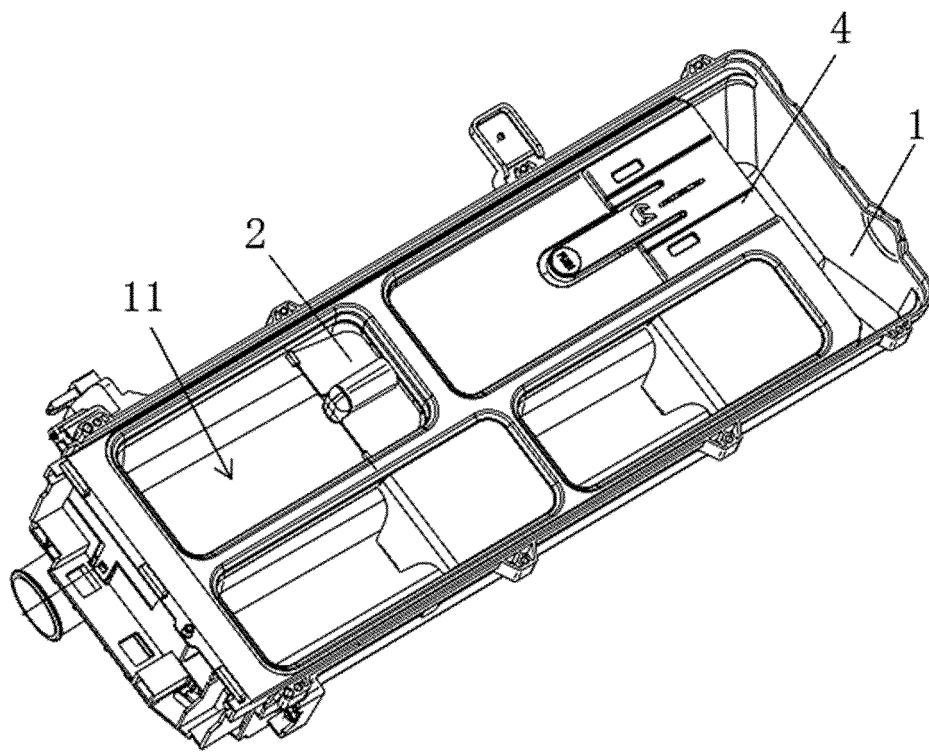


FIG. 5

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2019/111234

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 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) CNABS, CNTXT, DWPI, SIPOABS, CNKI: 洗涤剂盒, 虹吸, 旋转, 转动, 洗涤剂, 洗涤液, 液体, 固体, 洗衣粉, 限位, 支撑, 定位, detergent, abluent, agent, abstergent, box, case, rotat+, revolv+, twirl+, rotary, turn+, siphon, syphon, siphonate, liquid, fluid, solid, powder, limit, stop, support																		
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>A</td> <td>US 2011247147 A1 (WHIRLPOOL CO.) 13 October 2011 (2011-10-13) description, paragraph [0019], and figures 1 and 2</td> <td>1-10</td> </tr> <tr> <td>PX</td> <td>CN 109183360 A (QINGDAO HAIER DRUM WASHING MACHINE CO., LTD.) 11 January 2019 (2019-01-11) claims 1-10</td> <td>1-10</td> </tr> <tr> <td>A</td> <td>CN 108221289 A (QINGDAO HAIER WASHING MACHINE CO., LTD. et al.) 29 June 2018 (2018-06-29) entire document</td> <td>1-10</td> </tr> <tr> <td>A</td> <td>CN 204509794 U (HEFEI HONGJIAN PRECISION MOLD CO., LTD.) 29 July 2015 (2015-07-29) entire document</td> <td>1-10</td> </tr> <tr> <td>A</td> <td>KR 101010680 B1 (LG ELECTRONICS INC.) 24 January 2011 (2011-01-24) 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.	A	US 2011247147 A1 (WHIRLPOOL CO.) 13 October 2011 (2011-10-13) description, paragraph [0019], and figures 1 and 2	1-10	PX	CN 109183360 A (QINGDAO HAIER DRUM WASHING MACHINE CO., LTD.) 11 January 2019 (2019-01-11) claims 1-10	1-10	A	CN 108221289 A (QINGDAO HAIER WASHING MACHINE CO., LTD. et al.) 29 June 2018 (2018-06-29) entire document	1-10	A	CN 204509794 U (HEFEI HONGJIAN PRECISION MOLD CO., LTD.) 29 July 2015 (2015-07-29) entire document	1-10	A	KR 101010680 B1 (LG ELECTRONICS INC.) 24 January 2011 (2011-01-24) entire document	1-10
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Date of the actual completion of the international search 14 January 2020	Date of mailing of the international search report 22 January 2020																	
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.																	

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

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REFERENCES CITED IN THE DESCRIPTION

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