(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 3 258 052 A1

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

(43) Date of publication:
20.12.2017 Bulletin 2017/51

(21) Application number: **16748551.5**

(22) Date of filing: **12.01.2016**

(51) Int Cl.:
E06B 7/14 *(2006.01)*

(86) International application number:
PCT/CN2016/070695

(87) International publication number:
WO 2016/127750 (18.08.2016 Gazette 2016/33)

(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:
MA MD

(30) Priority: **13.02.2015 CN 201510083579**

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(54) DRAINAGE DEVICE OF PUSH-PULL DEVICE

(57) Disclosed is a drainage device of a push-pull device, the drainage device (1) comprising a drainage box (10), and the drainage box (10) comprising a first trough body (110) and a drainage chamber body (111), wherein the first trough body (110) is in communication with a first end (1111) of the drainage chamber body (111), and the first end (1111) of the drainage chamber body (111) is in communication with a second end (1112) of the drainage chamber body (111); the drainage device (1) further comprises a water plugging block (30), the water plugging block (30) comprising a first connecting part (310) and a water plugging part, under an installation state, the water plugging part of the water plugging block (30) is arranged between overlapping parts of two push-pull leaves of the push-pull device, the first connecting part (310) penetrates through a downward sliding first opening of the push-pull device and is fixedly arranged in the first trough body (110), and the drainage box (10) is arranged in a downward sliding chamber body; the second end (1112) of the drainage chamber body (111) extends out of a downward sliding second opening of the push-pull device; and the drainage device (1) further comprises a first one-way valve (20), wherein the first one-way valve (20) is arranged on the first connecting part (310) and is used for controlling opening and closing of a communicating passageway between the first trough body (110) and the drainage chamber body (111).

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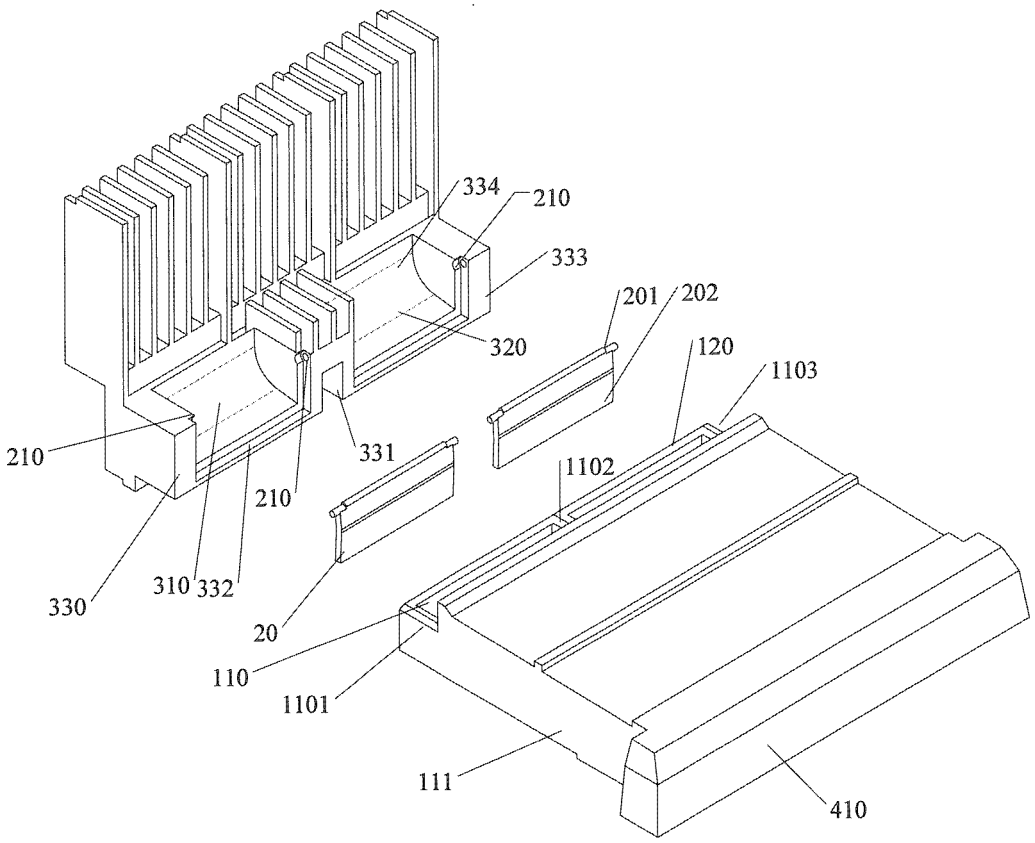
334
210
333
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1102
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330
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332
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110
1101
111
410

Figure 1

Description

[0001] The application claims the priority of Chinese Patent Application No. 201510083579.7, filed on February 13, 2015 and entitled "DRAINAGE DEVICE OF PUSH-PULL DEVICE", the disclosure of which is hereby incorporated by reference in its entirety.

Technical Field of the present invention

[0002] The present invention relates to the technical field of push-pull devices, and in particular to a drainage device of a push-pull device.

Background of the present invention

[0003] In most traditional push-pull devices, a drainage hole has always been directly formed on a lower rail thereof for draining water away. The absence of a drainage device leads to both poor gas tightness and water tightness. In addition, as a result of doing so, when there is heavy rain and strong wind outside, rainwater is highly likely to flow backward into rooms, thus greatly influencing our daily life.

Summary of the present invention

[0004] With regard to the problems mentioned above, the purpose of the present invention is to provide a drainage device of a push-pull device so as to solve the problem that outside rainwater flows backward into rooms. In this way, the water tightness of push-pull devices is improved.

[0005] The present invention provides a drainage device of a push-pull device, including a drainage box, the drainage box including a first trough body and a drainage chamber body, the first trough body being communicated with a first end of the drainage chamber body, the first end of the drainage chamber body being communicated with a second end of the drainage chamber body.

the drainage device further includes a water plugging block, the water plugging block including a first connecting part and a water plugging part; in the mounted state, the water plugging part of the water plugging block is arranged between overlapped parts of two push-pull leaves of a push-pull device, the first connecting part penetrates through a downward-sliding first opening of the push-pull device and is fixedly arranged inside the first trough body, and the drainage box is arranged inside a downward-sliding chamber body; and the second end of the drainage chamber body extends out of a downward-sliding second opening of the push-pull device; and

the drainage device further includes a first one-way valve, which is arranged on the first connecting part to control the opening or closing of a communication passageway between the first trough body and the drainage chamber body.

wherein, the water plugging block further includes a second connecting part, and the drainage box includes a second trough body; in the mounted state, the second connecting part penetrates through a downward-sliding first opening of the push-pull device and is fixedly arranged inside the second trough body.The drainage device further includes a second one-way valve which is arranged on the second connecting part.

wherein, the first connecting part is arranged inside the first trough body, and/or the second connecting part is arranged inside the second trough body.

[0006] Wherein, the first connecting part includes a first connecting device, a second connecting device and a first buffering channel, the first connecting device and the second connecting device (331) are respectively arranged on two sides of the first buffering channel, and the first connecting device, the first buffering channel and the second connecting device allow the first connecting part to have a U-shaped longitudinal section.

[0007] The first trough body includes a first receiving device , a second receiving device and a first bottom, and the first receiving device, the first bottom and the second receiving device allow the first trough body to have a U-shaped longitudinal section.

[0008] In the mounted state, the first connecting device is mounted on the first receiving device, and the second connecting device is mounted on the second receiving device, so that the first connecting part is arranged inside the first trough body.

[0009] Wherein, the first one-way valve includes a clamping part and a cover plate; a clamping structure is provided on the first connecting device and the second connecting device of the first connecting part, and the clamping part can be rotatably clamped on the clamping structure.

[0010] Wherein, the second connecting part includes a second buffering channel and a third connecting device, the third connecting device, the second buffering channel and the second connecting device allow the second connecting part to have a U-shaped longitudinal section.

[0011] The second trough body (120) further includes a third receiving device (1103) and a second bottom, the second receiving device, the second bottom and a third receiving device allow the second trough body to have a U-shaped longitudinal section.

[0012] In the mounted state, the third connecting device is mounted on the third receiving device, and the second connecting device is mounted on the second receiving device, so that the second connecting part is arranged inside the first trough body.

[0013] Wherein, the second one-way valve includes a clamping part and a cover plate; a clamping structure is provided on the second connecting device and the third connecting device of the second connecting part, and the clamping part can be rotatably clamped on the clamping structure.

[0014] Wherein, the cover plate is a curved cover plate.

[0015] Wherein, the first connecting part is hermetical-

ly arranged inside the first trough body, and/or the second connecting part is hermetically arranged inside the second trough body.

[0016] Wherein, a drainage lid is provided at a second end of the drainage chamber body, and the length of the drainage lid is greater than that of the downward-sliding second opening of the push-pull device.

[0017] With regard to the present invention, a water plugging structure of a push-pull device is used, and a drainage box is designed inside a lower-rail profile chamber of a push-pull device in coordination with the structure, so as to enhance the gas tightness and water tightness and solve the problem that rainwater flows backward and into rooms in the existing push-pull devices.

Brief Description of the Drawings

[0018] The accompanying drawings incorporated into the description and constitute a part of the description show the embodiments of the present invention, and are used to explain the principle of the present invention together with the description. In these drawings, similar reference numerals are used to denote similar elements. The drawings described below show some but not all of the embodiments of the present invention. For a person of ordinary skill in the art, other drawings can be obtained according to these drawings without paying any creative effort.

Fig. 1 is an exploded view of a drainage device of a push-pull device according to an embodiment of the present invention;

Fig. 2 is a schematic view of a drainage device of a push-pull device according to an embodiment of the present invention; and

Fig. 3 is a cross-sectional view of a drainage device of a push-pull device according to an embodiment of the present invention.

Detailed Description of the present invention

[0019] To make the purposes, technical solutions and advantages of the embodiments of the present invention more clear, the technical solutions in the embodiments of the present invention will be clearly and completely described with reference to the drawings in the embodiments of the present invention. Apparently, the embodiments described are some but not all of the embodiments of the present invention.On the basis of the embodiments in the present invention, all other embodiments, obtained by a person of ordinary skill in the art without paying any creative efforts, shall fall into the protection scope of the present invention. It should be noted that, if not conflict, the embodiments in the application and characteristics in the embodiments can be arbitrarily combined with each other.

[0020] The present invention provides a drainage device of a push-pull device, which is particularly suitable to be mounted between two push-pull leaves. The purpose is that a drainage box is provided in coordination with a downward-sliding inner chamber of a push-pull device and is meanwhile combined with a water plugging block to form a hermetic water guide passageway, so that the water tightness of the push-pull device is enhanced.

[0021] The drainage device of a push-pull device provided by the present invention will be described in detail with reference to the drawings. The push-pull device provided in the present invention can be a push-pullwindow or a push-pulldoor, or other apparatuses to which this push-pull device is applied. In the present invention, a sliding window is exemplified for detailed description.

[0022] As shown in Fig. 1, the present invention provides a drainage device 1 of a push-pull device, including a drainage box 10, the drainage box 10 including a first trough body 110 and a drainage chamber body 111. As shown in Fig. 3, the first trough body 110 is communicated with a first end 1111 of the drainage chamber body 111, and the first end 1111 of the drainage chamber body 111 is communicated with a second end 1112 of the drainage chamber body 111.

[0023] Again, as shown in Fig. 1, the drainage device1 further includes a water plugging block 30, the water plugging block 30 including a first connecting part 310 and a water plugging part; and in the mounted state, the water plugging part of the water plugging block 30 is arranged between overlapped parts of two push-pull leaves of a push-pull window, the first connecting part 310 penetrates through a downward-sliding first opening of the push-pull window and is fixedly arranged inside the first trough body 110, and the drainage box 10 is arranged inside a downward-sliding chamber body. Wherein, the shape of the drainage box 10 can be adapted to the downward-sliding chamber body. The second end 1112 of the drainage chamber body 111 extends out of a downward-sliding second opening of the push-pull device.

[0024] The drainage device 1 further includes a first one-way valve 20 which is arranged on the first connecting part 310 to control the opening and closing of a communication passageway between the first trough body 110 and the drainage chamber body 111.

[0025] As shown in Fig. 1, the water plugging block 30 can further include a second connecting part 320, and the drainage box 10 can also include a second trough body 120.

[0026] In the mounted state, the second connecting part 320 penetrates through a downward-sliding first opening of the push-pull device and is fixedly arranged inside the second trough body 120.

[0027] Wherein, the structure and configuration of the second connecting part 320 of the water plugging block 30 are the same as those of the first connecting part 310 of the water plugging block 30; and correspondingly, the structure and configuration of the first trough body 110 are the same as those of the second trough body 120.

[0028] The water plugging block 30 can include Q con-

necting parts, and correspondingly, the drainage box 10 can include Q trough bodys; and the Q connecting parts are respectively fixedly connected to the corresponding trough bodys, and all the Q trough bodys are communicated with the drainage chamber body. Of course, there may be one or more drainage chamber bodies, and the drainage chamber body is communicated with one or more of the Q trough bodys as desired. The number of drainage valves can be correspondingly set according to the number of trough bodys.

[0029] Wherein, Q can be any natural number greater than zero. In Fig. 1, Q equals to 2.

[0030] As shown in Fig. 1, the first connecting part 310 of the water plugging block 30 includes a first buffering channel 332, a first connecting device 330 and a second connecting device 331, and the first buffering channel 332 includes a top-down bevel structure 3321 which is convenient for water to flow. The accumulated water flowing from the upper part of the water plugging block enters the first buffering channel 332 and flows through the bevel structure 3321, and enters the drainage chamber body 111 via the first one-way valve 20. On one hand, the arrangement of such a bevel structure 3321 can slow down water flowing from the upper part, without resulting in splashing because of the direct falling of water into the first connecting part 310. On the other hand, the water flowing from the upper part can be directly pushed to the first one-way valve 20, so that the first one-way valve 20 can be fully opened under the pressure. In this way, the accumulated water is guided into the drainage chamber body 111 and further led out of the push-pull device 1.

[0031] The first buffering channel 332 can also include a gentle section 3322 so as to further slow-down the flowing of the accumulated water. In this way, impact on the first one-way valve 20 is weakened.

[0032] The first connecting device 330 and the second connecting device 331 are respectively located on two sides of the first buffering channel 332, so that the first connecting part 310 is allowed to have a U-shaped longitudinal section. Correspondingly, the first trough body 110 of the drainage box 10 includes a first receiving device 1101 and a second receiving device 1102, both of which are matched with the first connecting device 330 and the second connecting device 331 of the first connecting part 310, and also includes a first bottom (not shown) connecting the first receiving device 1101 and the second receiving device 1102. In this way, the first trough body 110 is allowed to have a U-shaped longitudinal section.

[0033] The first receiving device 1101 and the second receiving device 1102 of the first trough body 110 corresponding to the first connecting device 330 and the second connecting device 331 of the first connecting part 310 can be connected in any way. Any structure, as long as it can realize the connection between the first trough body 110 and the first connecting part 310, shall fall into the protection scope of the present invention. In the present invention, a structure connected by snap fit is exemplarily shown. Specifically, the first connecting device 330 and the second connecting device 331 are of recessed structures, for example, slots. The first receiving device 1101 and the second receiving device 1102 are of protruded structures fitted with the recessed structures, for example, plates. In the mounted state, the first connecting device 330 of the first connecting part 310 is clamped in the first receiving device 1101, and the second connecting device 331 thereof is clamped in the second receiving device 1102. In this way, the first buffering channel 332 of the first connecting part 310 is arranged inside the first trough body 110. The first buffering channel 332 corresponds to the first one-way valve 20.

[0034] As shown in Fig. 2, the first one-way valve 20 is arranged on the first connecting part 310 of the water plugging block.

[0035] The first one-way valve 20 can be arranged on the water plugging block or the drainage box in any way. In the present invention, detailed description will be given by taking the arrangement of the first one-way valve 20 on the water plugging block as an example.

[0036] The first one-way valve 20 includes a clamping part 201 and a cover plate 202. The clamping part is cylindrical and is clamped between the first connecting device and the second connecting device of the first connecting part. The cover plate 202 is a curved cover plate having a curved longitudinal section. As shown in Fig. 1, a clamping structure 210 is provided at corresponding locations on the first connecting device and the second connecting device. The clamping part 201 of the first one-way valve 20 can be rotatably clamped at the clamping structure 210 of the first connecting device and the second connecting device. Wherein, the width of the cover plate 202 is greater than the depth of the first connecting part 310. In the non-drainage state, the location of the cover plate 202 is lower than the depth of the first connecting part 310. In this way, in the non-drainage state, the first one-way valve 20 makes it possible to separate the inside of the push-pull device from the outside thereof. Even in the windy state, the cover plate 202 generates a thrust force towards the inside under the impact of wind. since the location of the cover plate 202 of the first one-way valve 20 is lower than the depth of the first connecting part 310, the cover plate 202 receives resistance from a first bottom surface of the first connecting part 310, the cover plate 202 will not rotate towards the inside, making it possible to separate the inside of the push-pull device from the outside thereof.

[0037] In actual application, the width of the cover plate 202 can be the same as the depth of the first trough body.

[0038] When the drainage device provided by the present invention further includes a second connecting part, a second trough body and a second one-way valve, the second connecting part can further include a second buffering channel and a third connecting device. In this way, the second connecting device, the second buffering channel and the third connecting device allow the second connecting part to have a U-shaped longitudinal section.

[0039] The second trough body further includes a third receiving device 1103 and a second bottom. In this way, the second connecting device 1102, the second bottom and the third receiving device 1103 allow the second trough body 120 to have a U-shaped longitudinal section. In the mounted state, the second connecting device 331 and the third connecting device 333 are respectively connected to the second receiving device 1102 and the third receiving device 1103, so that the second buffering channel 334 of the second connecting part 320 is arranged inside the second trough body 120.

[0040] Wherein, the second buffering channel can have the same structure as the first buffering channel.

[0041] The second one-way valve is arranged on the second connecting part and has a same connecting structure as the first one-way valve.

[0042] Similarly, the drainage device can also include a third connecting part and a third trough body and has a same structure as the second connecting part and the second trough body mentioned above.

[0043] Further, the first connecting part 310 is hermetically arranged inside the first trough body 110, and/or the second connecting part 320 is hermetically arranged inside the second trough body 120. The sealing can be performed in any way. For example, a sealant is applied so that the first connecting part 310 is hermetically arranged inside the first trough body 110, and/ or the second connecting part 320 is hermetically arranged inside the second trough body 120.

[0044] When in windy or rainy days, the accumulated water entering the rooms flows down from the upper part of the water plugging block 20, through the water plugging part, and into the buffering channel of the connecting part; the hydraulic pressure generated by water entering the buffering channel forces the one-way valve 20 to open; and the accumulated water enters the drainage chamber body 111 via the drainage valve. Meanwhile, since the first end of the drainage chamber body 111 is in a hermetic state when the one-way valve 20 is closed, when rainwater from the outside enters into the drainage chamber body 111 because of the wind pressure, the rainwater is blocked out of the valve and thus unable to enter the inside. In this way, the water tightness of the whole window is guaranteed.

[0045] It is proved by a large quantity of performance tests that the water tightness Δ P of the drainage device provided with the push-pull devices in the present invention is up to above 500 Pa, equivalent to Grade 5 in the national standard.

[0046] In addition, again as shown in Fig. 3, the first connecting part 310 and/or the second connecting part 320 includes a top-down bevel structure. A gentle section connected to the bevel structure can also be included. A drainage lid 410 is provided at a second end 1112 of the drainage chamber body 111, and the length of the drainage lid 410 is greater than that of the downward-sliding second opening of the push-pull door/window. In addition, a clamping structure is also provided on each of four sides of the second end 1112 of the drainage box 10 to be clamped with the drainage lid.

[0047] As described above, in the present invention, a water plugging structure of a push-pull device is used, and a drainage box is designed inside a lower-rail profile chamber of a push-pull device in coordination with the structure, so as to enhance the gas tightness and water tightness and solve the problem that rainwater flows backward and into rooms in the existing push-pull devices.

[0048] The content described above can be implemented separately or incombinations in various ways. However, all those variations shall fall into the protection scope of the present invention.

[0049] The value of the specific size of components listed in the present invention is exemplary. The size parameters of different components may take different values during practical construction according to construction requirements.

[0050] It should be noted that terms as used here, such as "include", "comprise" or other variants, are intended to cover non-exclusive inclusion, so that an item or an apparatus including a series of elements includes not only these elements, and also other elements not explicitly listed, or also includes elements intrinsic to this item or apparatus. In the absence of more restrictions, an element defined by a statement "include...." does not exclude the possibility that there are additional same elements in the item or apparatus including this element.

[0051] The embodiments above are merely used to describe but not to limit the technical solutions of the present invention. The present invention has been described in detail merely with reference to preferred embodiments. It should be understood by a person of ordinary skill in the art that modifications and equivalent replacements can be made to the technical solutions of the present invention without departing from the spirit and scope of the technical solutions of the present invention, and those modifications and equivalent replacementsshall fall into the scopedefined by the claims of the present invention.

Industrial Applicability

[0052] In the present invention, a water plugging block structure of a push-pull structure is used, and a drainage box is provided in coordination with a downward-sliding inner chamber of the push-pull device, and also in combination with the water plugging block to form a hermetic water guide passageway. In this way, the water tightness of the push-pull device is enhanced.

Claims

1. A drainage device (1) of a push-pull device, **characterized in that**, the drainage device (1) comprises a drainage box (10), the drainage box (10) comprising a first trough body (110) and a drainage chamber

body (111), the first trough body (110) being communicated with a first end (1111) of the drainage chamber body (111), the first end (1111) of the drainage chamber body (111) being communicated with a second end (1112) of the drainage chamber body (111);
the drainage device (1) further comprises a water plugging block (30), the water plugging block (30) comprising a first connecting part (310) and a water plugging part; in the mounted state, the water plugging part of the water plugging block (30) is arranged between overlapped parts of two push-pull leaves of the push-pull device, the first connecting part (310) penetrates through a downward-sliding first opening of the push-pull device and is fixedly arranged inside the first trough body (110), and the drainage box (10) is arranged inside a downward-sliding chamber body; and the second end (1112) of the drainage chamber body (111) extends out of a downward-sliding second opening of the push-pull device; and
the drainage device (1) further comprises a first one-way valve (20) which is arranged on the first connecting part (310) to control the opening and closing of a communication passageway between the first trough body (110) and the drainage chamber body (111).

2. The drainage device (1) according to claim 1, **characterized in that**, the water plugging block (30) further comprises a second connecting part (320), and the drainage box (10) comprises a second trough body (120);
in the mounted state, the second connecting part (320) penetrates through a downward-sliding first opening of the push-pull device and is fixedly arranged inside the second trough body (120); and
the drainage device (1) further comprises a second one-way valve which is arranged on the second connecting part (320).

3. The drainage device (1) according to claim 1 or 2, **characterized in that**, the first connecting part (310) is arranged inside the first trough body (110), and/or the second connecting part (320) is arranged inside the second trough body (120).

4. The drainage device (1) according to claim 3, **characterized in that**, the first connecting part (310) comprises a first connecting device (330), a second connecting device (331) and a first buffering channel (332), the first connecting device (330) and the second connecting device (331) are respectively arranged on two sides of the first buffering channel (332), and the first connecting device (330), the first buffering channel (332) and the second connecting device (331) allow the first connecting part (310) to have a U-shaped longitudinal section;
the first trough body (110) comprises a first receiving device (1101), a second receiving device (1102) and a first bottom, and the first receiving device (1101), the first bottom and the second receiving device (1102) allow the first trough body (110) to have a U-shaped longitudinal section; and
in the mounted state, the first connecting device (330) is mounted on the first receiving device (1101), and the second connecting device (331) is mounted on the second receiving device (1102), so that the first connecting part (310) is arranged inside the first trough body (110).

5. The drainage device (1) according to claim 4, **characterized in that**, the first one-way valve (20) comprises a clamping part (201) and a cover plate (202); a clamping structure (210) is provided on the first connecting device (330) and the second connecting device (331) of the first connecting part (310), and the clamping part (201) can be rotatably clamped on the clamping structure (210).

6. The drainage device (1) according to claim 4, **characterized in that**, the second connecting part (320) comprises a second buffering channel (334) and a third connecting device (333), the third connecting device (333), the second buffering channel (334) and the second connecting device (331) allow the second connecting part (320) to have a U-shaped longitudinal section;
the second trough body (120) further comprises a third receiving device (1103) and a second bottom, the second receiving device (1102), the second bottom and a third receiving device (1103) allow the second trough body (120) to have a U-shaped longitudinal section; and
in the mounted state, the third connecting device (333) is mounted on the third receiving device (1103), the second connecting device (331) is mounted on the second receiving device (1102), so that the second connecting part (320) is arranged inside the first trough body (120).

7. The drainage device (1) according to claim 6, **characterized in that**, the second one-way valve comprises a clamping part (201) and a cover plate (202); a clamping structure (210) is provided on the second connecting device (331) and the third connecting device (333) of the second connecting part (320), and the clamping part (201) can be rotatably clamped on the clamping structure (210).

8. The drainage device (1) according to claim 5, **characterized in that**, the cover plate (202) is a curved cover plate.

9. The drainage device (1) according to claim 3, **characterized in that**, the first connecting part (310) is hermetically arranged inside the first trough body

(110), and/or the second connecting part (320) is hermetically arranged inside the second trough body (120).

10. The drainage device (1) according to claim 1, **characterized in that**, a drainage lid is provided at a second end (1112) of the drainage chamber body (111), and the length of the drainage lid is greater than that of the downward-sliding second opening of the push-pull device.

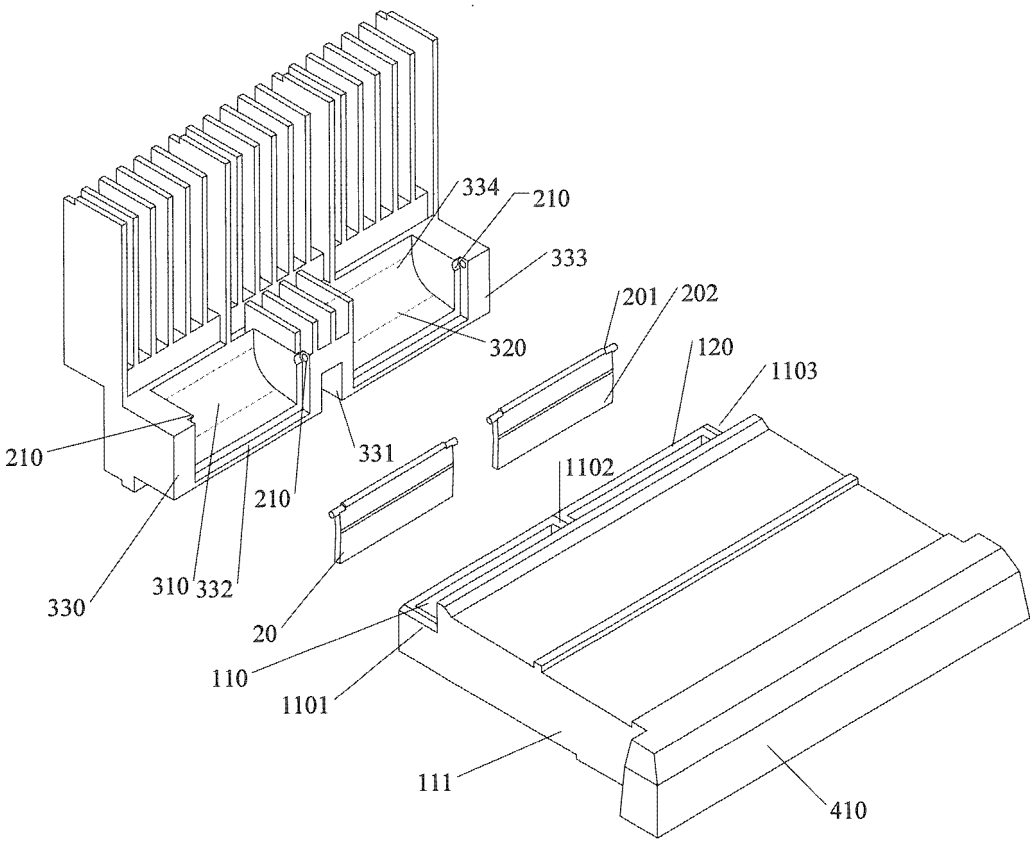
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Figure 1

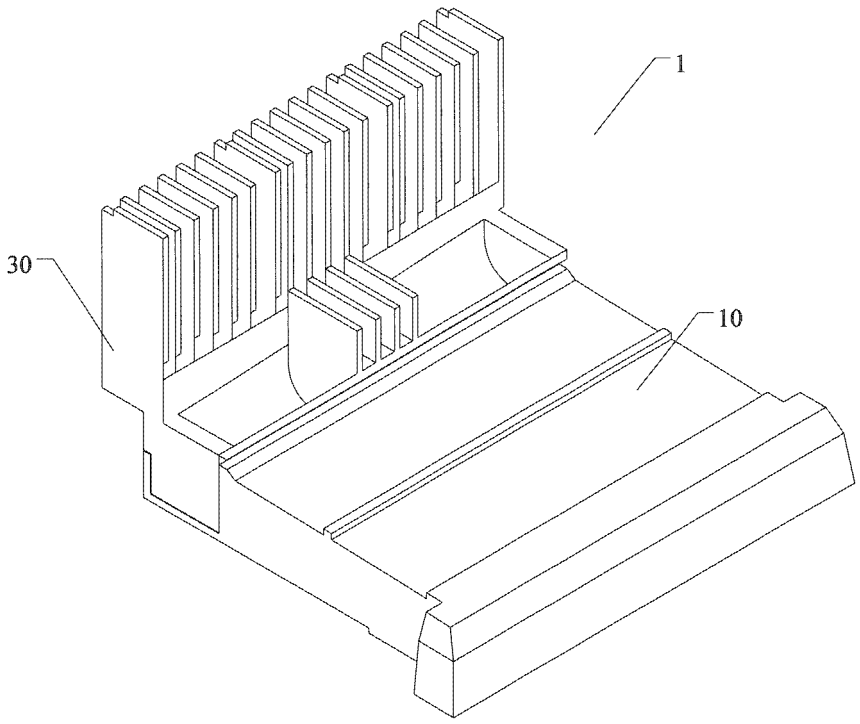

Figure 2

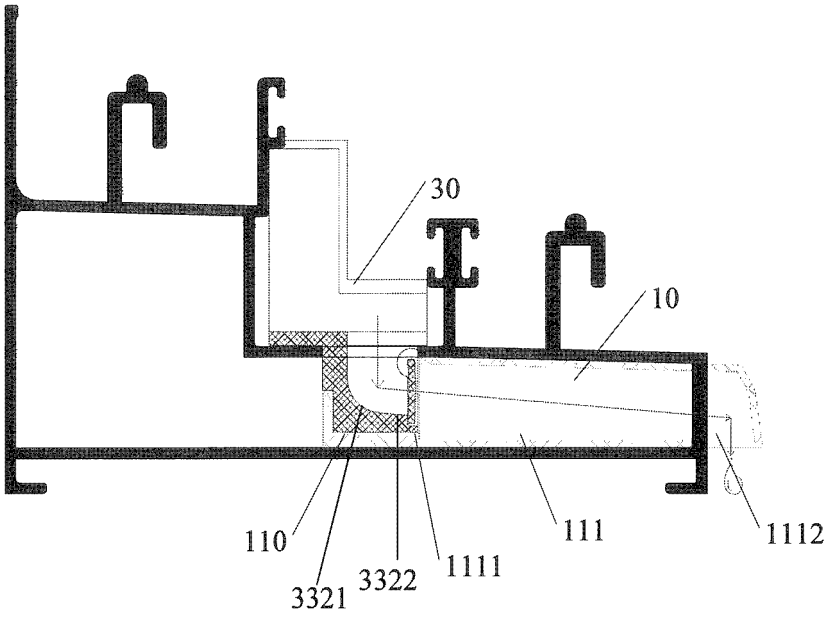

Figure 3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2016/070695

A. CLASSIFICATION OF SUBJECT MATTER

E06B 7/14 (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)

E06B 7

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)

CPRSABS; VEN; CNKI: sinker, discharg+, drain+, exhaust, flowing, weir, spout, box, case, casing, cavity, chamber, bore, water W tight, joint W filling, backing W up, back W flow, down W draught, gas W seal, airtight W seal, air W tightness, ark, canal, driving W slot, groove, slot, socket, push W pull

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 104653073 A (GUANGDONG JIANMEI ALUMINIUM PROFILE) 27 May 2015 (27.05.2015) claims 1-10 and figures 1 to 3	1-10
Y	FR 2989719 A1 (FAIRIER L) 25 October 2013 (25.10.2013) the abstract and figures 1 to 4	1-3, 9, 10
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Date of the actual completion of the international search	Date of mailing of the international search report
22 March 2016	14 April 2016

Name and mailing address of the ISA	Authorized officer
State Intellectual Property Office of the P. R. China No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088, China Facsimile No. (86-10) 62019451	YAN, Junxia Telephone No. (86-10) 62084950

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INTERNATIONAL SEARCH REPORT

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Information on patent family members

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JPH 1030382 A	03 February 1998	None	

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REFERENCES CITED IN THE DESCRIPTION

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