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

(72) Inventors:  
• **LIU, Min**  
**Qingdao, Shandong 266101 (CN)**  
• **ZHOU, Zhixiang**  
**Qingdao, Shandong 266101 (CN)**  
• **WANG, Dong**  
**Qingdao, Shandong 266101 (CN)**

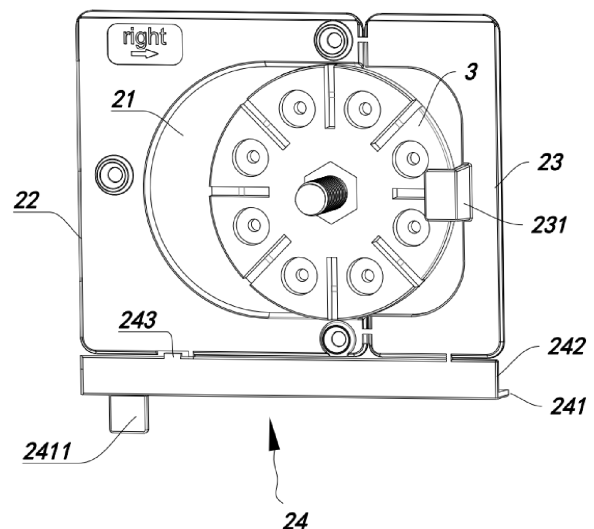
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(71) Applicants:  
• **Qingdao Haier Refrigerator Co., Ltd.**  
**Qingdao, Shandong 266101 (CN)**  
• **Qingdao Haier Smart Technology R&D Co., Ltd.**  
**Qingdao, Shandong 266101 (CN)**

(74) Representative: **Winter, Brandl - Partnerschaft mbB**  
**Alois-Steinecker-Straße 22**  
**85354 Freising (DE)**

(54) **EMBEDDED REFRIGERATION DEVICE**

(57) The present application discloses a built-in refrigeration device, comprising a cabinet, a refrigerator, and a plurality of positioning members, the refrigerator is installed in an accommodation chamber and has two front support legs located at a bottom of the refrigerator, the positioning members are disposed on a bottom wall of the accommodation chamber and have a positioning groove, the positioning member comprises a main body portion and a first auxiliary portion connected along a width direction of the cabinet, the positioning groove comprises a first portion at least partially located on the main body portion, the front support leg is at least partially located within the first portion.



**EP 4 772 818 A1**

## Description

[0001] The present application is based on Chinese patent application No. CN20231110159.4, filed on August 30, 2023, and claims the priority of the Chinese patent application..

## TECHNICAL FIELD

[0002] The present application relates to a field of refrigeration device manufacturing, and particularly to a built-in refrigeration device.

## BACKGROUND TECHNOLOGY

[0003] Installing a built-in refrigerator in a cabinet has many advantages, not only improving home aesthetics but also providing more practical functions. Firstly, installing a built-in refrigerator in a cabinet can create a more integrated home style. Compared to placing a refrigerator separately in one location, integrating the refrigerator into the cabinet can make an overall design more harmonious and a home style more unified. Secondly, installing a built-in refrigerator in a cabinet can increase storage space. If sufficient space is available, more drawers and partitions can be added to the cabinet to increase your storage space. Meanwhile, a space on a refrigerator door can also be used to place items.

[0004] Additionally, installing a built-in refrigerator in a cabinet can save more space. If a refrigerator is placed in a kitchen or a dining room, then you may need to reserve a certain amount of space for people to move around. However, embedding the refrigerator in the cabinet can save this part of space, making a home layout more flexible. Finally, installing a built-in refrigerator in a cabinet can also improve the energy efficiency of the refrigerator. Since this installation method will hide the refrigerator in the cabinet, thereby reducing an influence of external temperature and light, this helps maintain a temperature inside the refrigerator and reduce energy consumption.

[0005] When installing a refrigerator in an accommodation chamber inside a cabinet, if a position of the refrigerator in a front-rear direction shifts, a door of the cabinet will be unable to close the accommodation chamber. Therefore, it is necessary to provide a positioning member on a bottom wall of the accommodation chamber, and then confine a front support leg of the refrigerator within a positioning groove on the positioning member to limit the position of the refrigerator in the front-rear direction. When installing the positioning member, in order to determine an installation position of the positioning member in a left-right direction, one end of the positioning member is typically made to abut against a left side wall or a right side wall of the accommodation chamber. However, with this installation, when the refrigerator is installed in the accommodation chamber, lower ends of left and right side walls of a refrigerator cabinet body will

interfere with the positioning member.

[0006] Any prior art mentioned in the specification does not indicate confirmation or suggestion that said prior art constitutes part of common knowledge in any jurisdiction, or that said prior art can be reasonably expected to be understood, considered relevant, and/or combined with other prior art by a person skilled in the art.

## SUMMARY OF THE INVENTION

[0007] An object of the present application is to provide a built-in refrigeration device, to solve a problem in the prior art that a positioning member, which is installed on a bottom wall of an accommodation chamber of a cabinet for positioning a front support leg of a refrigerator and abuts against two lateral side walls of the accommodation chamber, will interfere with two side walls of a refrigerator cabinet body.

[0008] In order to achieve the above object of the present application, an embodiment of the present application provides a built-in refrigeration device, comprising a cabinet having an accommodation chamber, a refrigerator and a plurality of positioning members, the refrigerator is installed in the accommodation chamber and has two front support legs located at a bottom of the refrigerator, the positioning members are disposed on a bottom wall of the accommodation chamber and have a positioning groove configured to accommodate the front support leg, the positioning member comprises a main body portion and a first auxiliary portion connected along a width direction of the cabinet, the main body portion and the first auxiliary portion are separable under an external force, the positioning groove comprises a first portion at least partially located on the main body portion, the front support leg is at least partially located within the first portion, so that the first portion performs front and rear positioning on the front support leg, when the positioning member is installed in the cabinet, a side edge of the first auxiliary portion away from the main body portion abuts against a side wall of the accommodation chamber.

[0009] As a further improvement of an embodiment of the present application, a first handle is disposed on the first auxiliary portion, the first handle comprises a first connecting portion extending from an upper surface of the first auxiliary portion in a direction away from the first auxiliary portion and a bent portion formed on an end of the first connecting portion away from the first auxiliary portion.

[0010] As a further improvement of an embodiment of the present application, the positioning member further comprises a second auxiliary portion connected to a front side of the main body portion and/or the first auxiliary portion, the second auxiliary portion has a positioning portion downwardly bent to be in positioning engagement with a front wall of the cabinet, the second auxiliary portion is separable from the main body portion and/or the first auxiliary portion connected thereto under an external force.

**[0011]** As a further improvement of an embodiment of the present application, a second handle is disposed on the second auxiliary portion, the second handle extends from a front side of the positioning portion in a direction away from the positioning portion.

**[0012]** As a further improvement of an embodiment of the present application, the second auxiliary portion comprises a second connecting portion extending forwardly from the front side of the main body portion and/or the first auxiliary portion along the bottom wall of the accommodation chamber, the positioning portion is configured as a flanging formed downwardly from a front end of the second connecting portion, the flanging abuts against the front wall of the cabinet.

**[0013]** As a further improvement of an embodiment of the present application, the second auxiliary portion is connected to the main body portion and/or the first auxiliary portion through a plurality of connecting bridges.

**[0014]** As a further improvement of an embodiment of the present application, the refrigerator comprises a cabinet body and a plurality of support legs, the plurality of support legs are threadedly connected to a bottom of the cabinet body and are pivotable relative to the cabinet body, the plurality of support legs comprise the two front support legs close to a front side of the cabinet body and at least two rear support legs close to a rear side of the cabinet body, the at least two rear support legs are spaced apart in a left-right direction.

**[0015]** As a further improvement of an embodiment of the present application, the front support leg comprises a bolt connected to the bottom of the cabinet body and a support pad fixedly connected to an end of the bolt away from the cabinet body.

**[0016]** As a further improvement of an embodiment of the present application, a slot is provided on a side wall of the support pad.

**[0017]** As a further improvement of an embodiment of the present application, an inner wall of the positioning groove extends in a direction from bottom to top and is gradually inclined towards outside of the positioning groove.

**[0018]** Compared with the prior art, beneficial effects of the present application are:

When the positioning member is installed on the bottom wall of the accommodation chamber, the side edge of the first auxiliary portion away from the main body portion abuts against the side wall of the accommodation chamber, thereby restricting a lateral position of the positioning member relative to the cabinet, the front support leg is installed in the positioning groove, and the positioning groove is configured to limit a position of the front support leg in a front-rear direction, the first auxiliary portion can be separated from the main body portion through an external force, thereby avoiding interference between left and right side walls of the refrigerator cabinet body and the positioning member.

**[0019]** The term "comprise" and variations of the term, such as "comprises", "comprised", "comprising", "includ-

ing", "containing", do not exclude other features, components, elements or steps unless the context clearly requires otherwise.

## 5 BRIEF DESCRIPTION OF THE DRAWINGS

### [0020]

FIG. 1 is a structural schematic diagram of a built-in refrigeration device in an embodiment of the present application;

FIG. 2 is a structural schematic diagram of Figure 1 after a part of a cabinet door and a refrigerator door body are removed;

FIG. 3 is an enlarged view of a portion M in Figure 2; FIG. 4 is a structural schematic diagram of an engagement between a front support leg and a positioning member;

FIG. 5 is a structural schematic diagram of Figure 4 from another angle;

FIG. 6 is a cross-sectional view along a direction A-A in Figure 5;

FIG. 7 is a structural schematic diagram of the front support leg in Figure 4.

**[0021]** The above brief description of drawings includes the following reference numerals:

1. cabinet; 11. accommodation chamber; 2. positioning member; 21. positioning groove; 211. inner wall; 22. main body portion; 23. first auxiliary portion; 231. first handle; 2311. first connecting portion; 24. second auxiliary portion; 241. positioning portion; 2411. second handle; 242. second connecting portion; 243. connecting bridge; 3. front support leg; 31. bolt; 32. support pad; 321. slot; 4. cabinet body.

## DETAILED DESCRIPTION

**[0022]** It should be noted that, in non-conflicting cases, embodiments in the present application and features in the embodiments may be combined with each other. The present application will be described in detail below with reference to drawings and in combination with embodiments.

**[0023]** It should be pointed out that, unless otherwise indicated, all technical and scientific terms used in the present application have a same meaning as commonly understood by a person of ordinary skill in the technical field to which the present application belongs.

**[0024]** In the present application, unless stated to the contrary, directional terms used such as "upper", "lower", "top", "bottom" are generally with respect to directions shown in the drawings, or with respect to a component itself in a vertical, perpendicular or gravitational direction; similarly, for ease of understanding and description, "inner" and "outer" refer to an inside and an outside relative to a contour of each component itself, but the above

directional terms are not used to limit the present application.

**[0025]** In order to solve a problem in the prior art that a positioning member, which is installed on a bottom wall of an installation chamber of a cabinet for positioning a front support leg of a refrigerator, will interfere with left and right side walls of a cabinet body of the refrigerator when abutting against two lateral side walls of the installation chamber, the present application provides a built-in refrigeration device.

**[0026]** As shown in Figures 1-7, a built-in refrigeration device provided by an embodiment of the present application comprises a cabinet 1, a refrigerator, and a plurality of positioning members 2, the cabinet 1 has an accommodation chamber 11, the refrigerator is installed in the accommodation chamber 11, the refrigerator has two front support legs 3 located at a bottom of the refrigerator, the two front support legs 3 are typically spaced apart in a left-right direction.

**[0027]** The positioning members 2 are disposed on a bottom wall of the accommodation chamber 11, and a positioning member 2 has a positioning groove 21 configured to accommodate a front support leg 3, with this arrangement, after the positioning members 2 are installed on the bottom wall of the accommodation chamber 11, the front support legs 3 can be installed in the positioning grooves 21.

**[0028]** A positioning member 2 comprises a main body portion 22 and a first auxiliary portion 23 connected along a width direction of the cabinet 1, the main body portion 22 and the first auxiliary portion 23 are separable under an external force.

**[0029]** A positioning groove 21 comprises a first portion at least partially located on a main body portion 22, a front support leg 3 is at least partially located within the first portion, so that the first portion is configured to perform front and rear positioning on the front support leg 3.

**[0030]** When the positioning member is installed in the cabinet 1, a side edge of a first auxiliary portion 23 away from a main body portion 22 abuts against a side wall of the accommodation chamber, so that a position of the positioning member 2 during installation can be defined.

**[0031]** When a user installs the positioning members 2 on the bottom wall of the accommodation chamber 11, a side edge of a first auxiliary portion 23 away from a main body portion 22 abuts against a side wall of the accommodation chamber 11, thereby restricting a lateral position of the positioning member 2 relative to the cabinet 1, then, the front support legs 3 are installed in the positioning grooves 21, and the positioning grooves 21 are configured to limit a position of the front support legs 3 in a front-rear direction, finally, the first auxiliary portion 23 can be separated from the main body portion 22 through an external force, thereby avoiding interference between lower ends of left and right side walls of a cabinet body 4 of the refrigerator and the positioning members 2.

**[0032]** Preferably, as shown in Figures 4 and 6, a first handle 231 is disposed on the first auxiliary portion 23,

the first handle 231 comprises a first connecting portion 2311 extending from an upper surface of the first auxiliary portion 23 in a direction away from the first auxiliary portion 23 and a bent portion 2312 formed on an end of the first connecting portion 2311 away from the first auxiliary portion 23. When a user applies a force to the bent portion 2312, the first auxiliary portion 23 can be conveniently detached from the main body portion 22.

**[0033]** Further, the positioning member 2 further comprises a second auxiliary portion 24 connected to a front side of the main body portion 22 and the first auxiliary portion 23, the second auxiliary portion 24 has a positioning portion 241 downwardly bent to be in positioning engagement with a front wall of the cabinet 1, the second auxiliary portion 24 is separable from the main body portion 22 and the first auxiliary portion 23 connected thereto under an external force.

**[0034]** With this arrangement, the positioning engagement between the positioning portion 241 and the front wall of the cabinet 1 can restrict a front-rear position of the positioning member 2 on the bottom wall of the accommodation chamber 11, thereby ensuring that the front support legs 3 are installed inside the positioning grooves 21.

**[0035]** It should be noted that, the second auxiliary portion 24 is separable from the main body portion 22 and the first auxiliary portion 23 connected thereto under an external force, thereby ensuring that after the positioning members 2 are installed on the bottom wall of the accommodation chamber 11, the second auxiliary portion 24 can be removed through an external force, thereby preventing the second auxiliary portion 24 from affecting a sealing of a cabinet door during a closing process of the cabinet door of the cabinet 1.

**[0036]** In some embodiments, a second auxiliary portion 24 is connected to a front side of a main body portion 22 or connected to a front side of a first auxiliary portion 23, the second auxiliary portion 24 has a positioning portion 241 downwardly bent to be in positioning engagement with a front wall of the cabinet 1, the positioning portion 241 is downwardly bent to be in positioning engagement with the front wall of the cabinet 1, the second auxiliary portion 24 is separable from the main body portion 22 or the first auxiliary portion 23 connected thereto under an external force.

**[0037]** Further, a second handle 2411 is disposed on the second auxiliary portion 24, the second handle 2411 extends from a front side of the positioning portion 241 in a direction away from the positioning portion 241.

**[0038]** With this arrangement, when a user applies a force on the second handle 2411, an external force can be conveniently applied to the second auxiliary portion 24, facilitating detachment of the second auxiliary portion 24.

**[0039]** Referring to Figure 4, the second auxiliary portion 24 comprises a second connecting portion 242 extending forwardly from the front side of the main body portion 22 and/or the first auxiliary portion 23 along the bottom wall of the accommodation chamber 11, the po-

sitioning portion 241 is configured as a flanging formed downwardly from a front end of the second connecting portion 242, the flanging abuts against the front wall of the cabinet 1.

**[0040]** With this arrangement, when the flanging abuts against the front wall of the cabinet 1, a stable abutting effect can be obtained, thereby better limiting the position of the positioning member 2 in the front-rear direction.

**[0041]** Preferably, in the above embodiments, the second auxiliary portion 24 is connected to the main body portion 22 and/or the first auxiliary portion 23 through a plurality of connecting bridges 243. The connecting bridges 243 are typically made of a same material as the second auxiliary portion 24 and the main body portion 22.

**[0042]** The connecting bridge 243 is easy to break, with this arrangement, the second auxiliary portion 24 can be conveniently separated from the main body portion 22 and/or the first auxiliary portion 23.

**[0043]** Further, the refrigerator comprises a cabinet body 4 and a plurality of support legs, the plurality of support legs are threadedly connected to a bottom of the cabinet body 4 and are pivotable relative to the cabinet body 4.

**[0044]** With this arrangement, through pivoting of the support legs, a position of a support leg in a vertical direction relative to the cabinet body 4 can be adjusted, thereby enabling the support legs to better support the cabinet body 4 and avoiding shaking of the cabinet body 4 caused by uneven ground.

**[0045]** It should be noted that, the plurality of support legs comprise the two front support legs 3 close to a front side of the cabinet body 4 and at least two rear support legs close to a rear side of the cabinet body 4, the at least two rear support legs are also spaced apart in the left-right direction to ensure stability when supporting the cabinet body 4.

**[0046]** Specifically, referring to Figure 7, a front support leg 3 comprises a bolt 31 connected to the bottom of the cabinet body 4 and a support pad 32 fixedly connected to an end of the bolt 31 away from the cabinet body 4. Through a threaded connection between the bolt 31 and the bottom of the cabinet body 4, a height of the front support leg 3 in the vertical direction can be adjusted during a pivoting process of the bolt 31.

**[0047]** Referring to Figure 7, preferably, a slot 321 is provided on a side wall of the support pad 32. With this arrangement, when a rigid instrument such as a pry bar is inserted into the slot 321, the support pad 32 can be better rotated through a lever principle, thereby driving the bolt 31 to pivot relative to the bottom of the cabinet body 4.

**[0048]** Preferably, referring to Figure 6, in the above embodiments of the present application, an inner wall 211 of the positioning groove 21 extends in a direction from bottom to top and is gradually inclined towards outside of the positioning groove 21. With this arrangement, the inner wall 211 has a certain slope, and when the front support leg 3 is installed in the positioning groove 21, the

inner wall 211 can provide a good guiding function.

**[0049]** In summary, the built-in refrigeration device of the present application achieves the following technical effects:

5 When a positioning member 2 is installed on a bottom wall of an accommodation chamber 11, a side edge of a first auxiliary portion 23 away from a main body portion 22 abuts against a side wall of the accommodation chamber 11, thereby restricting a lateral position of the positioning member 2 relative to a cabinet 1, a front support leg 3 is installed in a positioning groove 21, and the positioning groove 21 is configured to limit a position of the front support leg 3 in a front-rear direction, the first auxiliary portion 23 can be separated from the main body portion 22 through an external force, thereby avoiding interference between left and right side walls of a cabinet body 4 of a refrigerator and the positioning member 2.

**[0050]** Obviously, the above-described embodiments are merely a part of the embodiments of the present application, rather than all of the embodiments. Based on the embodiments in the present application, all other embodiments obtained by a person of ordinary skill in the art without creative labor should fall within a protection scope of the present application.

25 **[0051]** It should be noted that terms used herein are only for describing specific embodiments, and are not intended to limit exemplary embodiments according to the present application. As used herein, unless the context clearly indicates otherwise, a singular form is also intended to include a plural form. Furthermore, it should also be understood that when the terms "comprise" and/or "include" are used in this specification, the terms indicate the presence of features, steps, operations, devices, components and/or combinations thereof.

30 **[0052]** It should be noted that terms "first", "second", etc. in the specification and claims of the present application and the above drawings are used to distinguish similar objects, and are not necessarily used to describe a specific order or sequence. It should be understood that data so used can be interchanged under appropriate circumstances, so that the embodiments of the present application described herein can be implemented in orders other than those illustrated or described herein.

35 **[0053]** The above descriptions are only preferred embodiments of the present application and are not used to limit the present application. For a person skilled in the art, the present application may have various modifications and changes. Any modifications, equivalent replacements, improvements, etc. made within a spirit and principles of the present application should be included within the protection scope of the present application.

## Claims

55 1. A built-in refrigeration device, comprising a cabinet (1) having an accommodation chamber (11), a refrigerator, and a plurality of positioning members (2),

the refrigerator is installed in the accommodation chamber (11) and has two front support legs (3) located at a bottom of the refrigerator, **characterized in that** the positioning members (2) are disposed on a bottom wall of the accommodation chamber (11) and have a positioning groove (21) configured to accommodate the front support leg (3), the positioning member (2) comprises a main body portion (22) and a first auxiliary portion (23) connected along a width direction of the cabinet (1), the main body portion (22) and the first auxiliary portion (23) are separable under an external force, the positioning groove (21) comprises a first portion at least partially located on the main body portion (22), the front support leg (3) is at least partially located within the first portion, so that the first portion performs front and rear positioning on the front support leg (3), when the positioning member (2) is installed in the cabinet (1), a side edge of the first auxiliary portion (23) away from the main body portion (22) abuts against a side wall of the accommodation chamber (11).

2. The built-in refrigeration device according to claim 1, **characterized in that** a first handle (231) is disposed on the first auxiliary portion (23), the first handle (231) comprises a first connecting portion (2311) extending from an upper surface of the first auxiliary portion (23) in a direction away from the first auxiliary portion (23) and a bent portion (2312) formed on an end of the first connecting portion (2311) away from the first auxiliary portion (23).

3. The built-in refrigeration device according to claim 1, **characterized in that** the positioning member (2) further comprises a second auxiliary portion (24) connected to a front side of the main body portion (22) and/or the first auxiliary portion (23), the second auxiliary portion (24) has a positioning portion (241) downwardly bent to be in positioning engagement with a front wall of the cabinet (1), the second auxiliary portion (24) is separable from the main body portion (22) and/or the first auxiliary portion (23) connected thereto under an external force.

4. The built-in refrigeration device according to claim 3, **characterized in that** a second handle (2411) is disposed on the second auxiliary portion (24), the second handle (2411) extends from a front side of the positioning portion (241) in a direction away from the positioning portion (241).

5. The built-in refrigeration device according to claim 3, **characterized in that** the second auxiliary portion (24) comprises a second connecting portion (242) extending forwardly from the front side of the main body portion (22) and/or the first auxiliary portion (23) along the bottom wall of the accommodation cham-

ber (11), the positioning portion (241) is configured as a flanging formed downwardly from a front end of the second connecting portion (242), the flanging abuts against the front wall of the cabinet (1).

6. The built-in refrigeration device according to claim 3, **characterized in that** the second auxiliary portion (24) is connected to the main body portion (22) and/or the first auxiliary portion (23) through a plurality of connecting bridges (243).

7. The built-in refrigeration device according to claim 1, **characterized in that** the refrigerator comprises a cabinet body (4) and a plurality of support legs, the plurality of support legs are threadedly connected to a bottom of the cabinet body (4) and are pivotable relative to the cabinet body (4), the plurality of support legs comprise the two front support legs (3) close to a front side of the cabinet body (4) and at least two rear support legs close to a rear side of the cabinet body (4), the at least two rear support legs are spaced apart in a left-right direction.

8. The built-in refrigeration device according to claim 7, **characterized in that** the front support leg (3) comprises a bolt (31) connected to the bottom of the cabinet body (4) and a support pad (32) fixedly connected to an end of the bolt (31) away from the cabinet body (4).

9. The built-in refrigeration device according to claim 8, **characterized in that** a slot (321) is provided on a side wall of the support pad (32).

10. The built-in refrigeration device according to claim 1, **characterized in that** an inner wall (211) of the positioning groove (21) extends in a direction from bottom to top and is gradually inclined towards outside of the positioning groove (21).

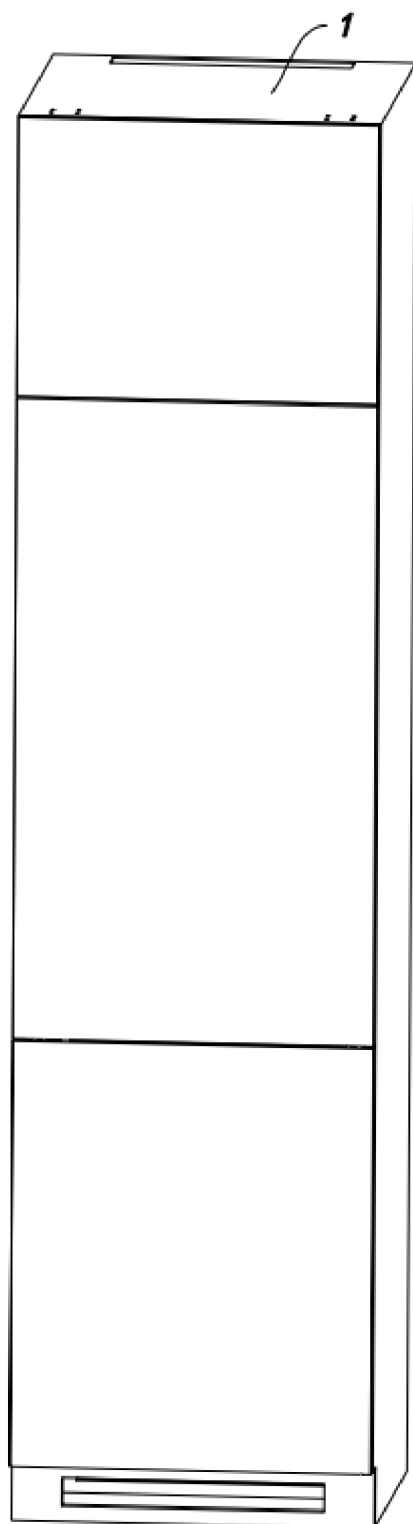


FIG. 1

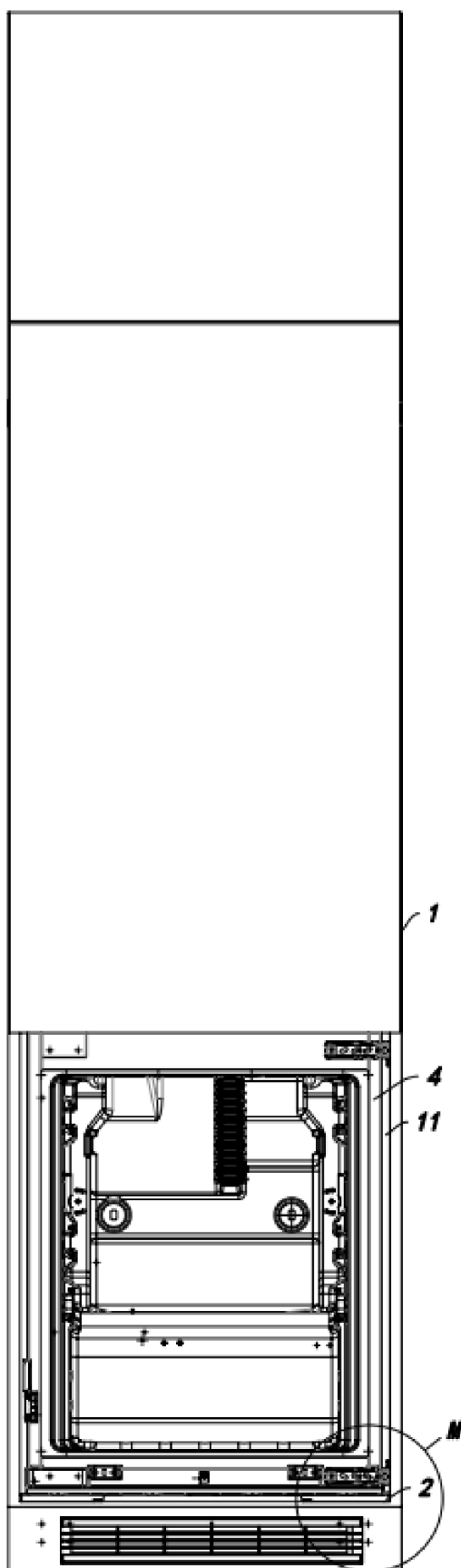


FIG. 2

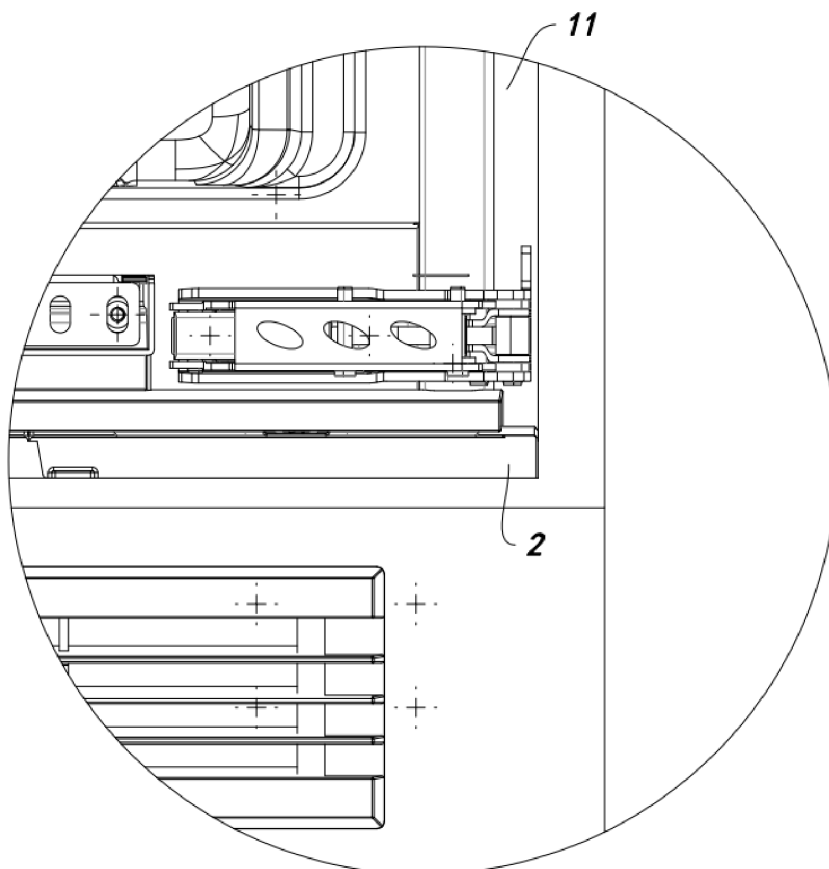


FIG. 3

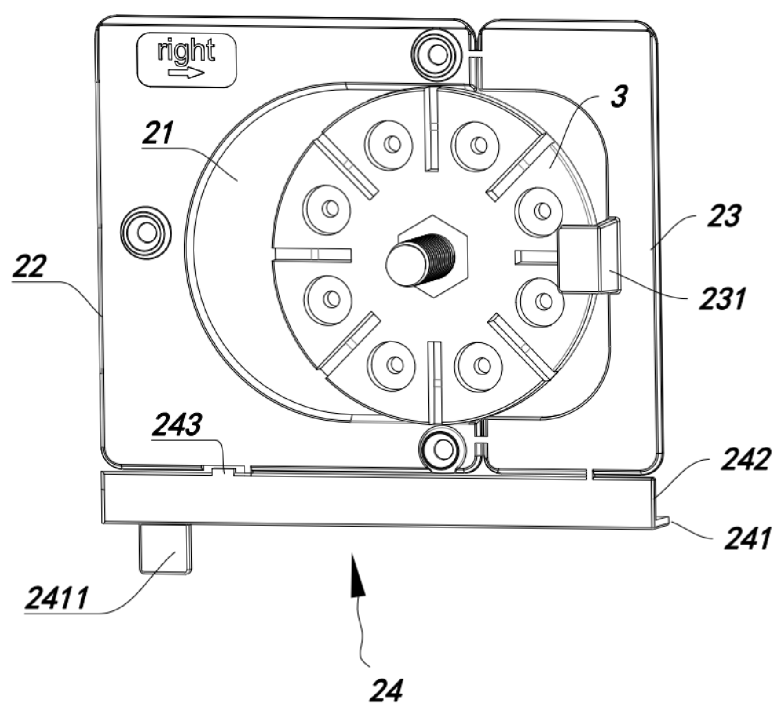


FIG. 4

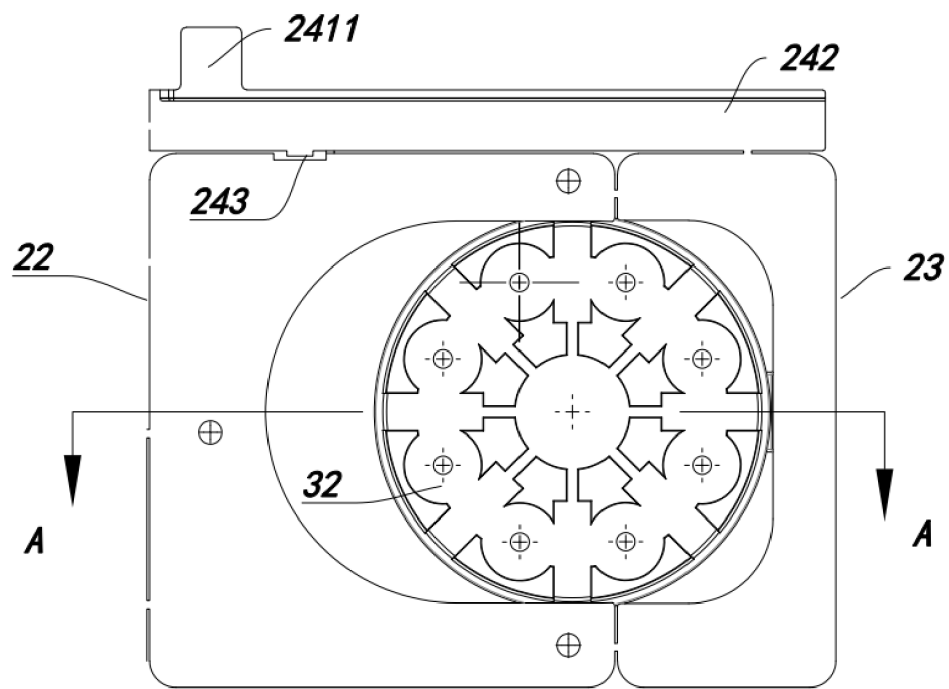


FIG. 5

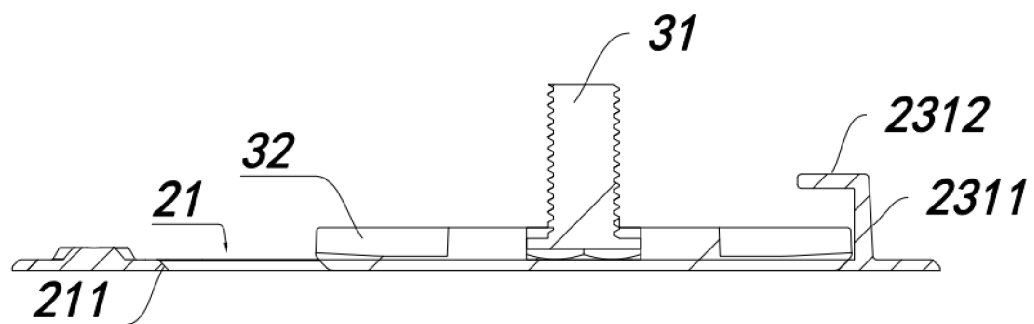


FIG. 6

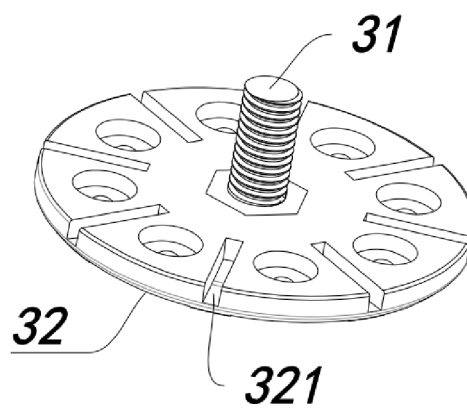


FIG. 7

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2024/114537

## A. CLASSIFICATION OF SUBJECT MATTER

F25D 23/10(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)

F25D23, F25D11, A47F3

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)

CNTXT, ENTXT, WPABS, WPABSC, ENTXTC, DWPI, VEN, CNKI: 一体, 嵌入, 橱柜, 限位, 支撑脚, 支脚, 支腿, 槽; embedded, built-in, integrated, cabinet, cupboard, stop, limit, support, leg, foot, feet, groove, slot

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                                                                 | Relevant to claim No. |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| PX        | CN 220959132 U (QINGDAO HAIER REFRIGERATOR CO., LTD. et al.) 14 May 2024 (2024-05-14)<br>description, paragraphs [0032]-[0056], and figures 1-7    | 1-10                  |
| A         | CN 216409471 U (QINGDAO HAIER REFRIGERATOR CO., LTD. et al.) 29 April 2022 (2022-04-29)<br>description, paragraphs [0041]-[0052], and figures 1-12 | 1-10                  |
| A         | CN 101982718 A (HEFEI MIDEA ROYALSTAR FRIDGE CO., LTD. et al.) 02 March 2011 (2011-03-02)<br>entire document                                       | 1-10                  |
| A         | CN 211601308 U (QINGDAO HAIER REFRIGERATOR CO., LTD. et al.) 29 September 2020 (2020-09-29)<br>entire document                                     | 1-10                  |
| A         | CN 107883661 A (HEFEI SNOWKY ELECTRIC CO., LTD.) 06 April 2018 (2018-04-06)<br>entire document                                                     | 1-10                  |
| A         | EP 2545809 A1 (BSH BOSCH SIEMENS HAUSGERAETE) 16 January 2013 (2013-01-16)<br>entire document                                                      | 1-10                  |

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

|                                                                                                                                                                         |                                                                                                                                                                                                                                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| * Special categories of cited documents:                                                                                                                                | "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                                              |
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|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| Date of the actual completion of the international search<br><b>23 December 2024</b>                                                                                                           | Date of mailing of the international search report<br><b>02 January 2025</b> |
| Name and mailing address of the ISA/CN<br><b>China National Intellectual Property Administration (ISA/CN)<br/>China No. 6, Xitucheng Road, Jimenqiao, Haidian District,<br/>Beijing 100088</b> | Authorized officer<br><br><br>Telephone No.                                  |

INTERNATIONAL SEARCH REPORT

International application No.  
**PCT/CN2024/114537**

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| C. DOCUMENTS CONSIDERED TO BE RELEVANT |                                                                                                                                    |                       |
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**REFERENCES CITED IN THE DESCRIPTION**

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