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(54) **STORAGE BOX AND REFRIGERATOR HAVING THE SAME**

(57) The present application discloses a storage box, comprising an enclosure, a storage box body, a pivot shaft connected to the enclosure and the storage box body, an elastic element disposed between the pivot shaft and the enclosure, and a locking device, wherein the elastic element always provides a driving force driving the storage box body to turn outwards the enclosure about the pivot shaft; the locking device comprises a locking portion disposed on the enclosure, and a fitting portion which is disposed on the storage box body and push-fitted with the locking portion. The storage box body can automatically turn without a handle being disposed, thereby expanding the space for storing items.

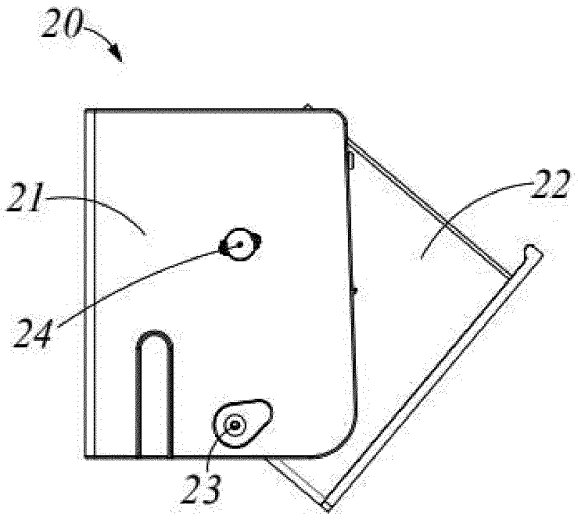

Fig. 1

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Description

TECHNICAL FIELD

[0001] The present utility model relates to the technical field of refrigerating devices, and specifically to a storage box and a refrigerator having the same.

BACKGROUND

[0002] A refrigerator is a refrigerating device commonly used in daily life. The refrigerator usually stores many diverse items. To store some items that need to be isolated from other items, storage boxes are disposed in the refrigerator, and are provided with a pull handle to facilitate opening and closing the storage boxes.

[0003] However, the designed pull handles occupy partial space. Since the space available for placing the storage boxes in the refrigerator is certain, when the storage boxes are disposed in the refrigerator, the space available for storing items will be substantially reduced; when the user's hands are dirty, they might pollute the pull handles when the user opens the storage boxes, thereby affecting the overall appearance of the storage boxes, and providing an undesirable experience effect.

SUMMARY

[0004] To solve the problems in the prior art, the present utility model provides a storage box and a refrigerator having the same, to solve the problems in the prior art that the space for storing items is substantially reduced since the handle is provided on the storage box, and the handle is likely to be polluted when the storage box is opened.

[0005] To achieve the above object of the utility model, an embodiment provides a storage box, comprising an enclosure, a storage box body, a pivot shaft connected to the enclosure and the storage box body, the storage box further comprising:

an elastic element disposed between the pivot shaft and the enclosure, the elastic element always providing a driving force driving the storage box body to turn outwards the enclosure about the pivot shaft;
a locking device comprising a locking portion and a fitting portion which is push-fitted with the locking portion, where one of the locking portion and the fitting portion is disposed on the enclosure, and the other is disposed on the storage box body.

[0006] Optionally, the elastic element is a torsion spring, the torsion spring comprises a spring body, and a spring arm connected to the spring body, and the spring body is sleeved on the pivot shaft.

[0007] Optionally, the enclosure comprises a fixing portion connected to a side wall of the enclosure, the fixing portion is provided with a through hole, and the spring arm passes through the through hole.

[0008] Optionally, the fitting portion is a lock tongue provided on a rear wall of the storage box body, and the locking portion is a push lock provided on a rear wall of the enclosure.

[0009] Optionally, the push lock comprises a first force receiving portion, a second force receiving portion, and a resisting portion, the first force receiving portion causes the resisting portion to release the lock tongue, and the second force receiving portion causes the resisting portion to clamp the lock tongue.

[0010] Optionally, the resisting portion is provided with a first protrusion, and the lock tongue is provided with a second protrusion.

[0011] Optionally, the storage box further comprises a damping device connected to the enclosure and the storage box body, and the damping device provides a resistance against the turn of the storage box body outward the enclosure.

[0012] Optionally, the damping device comprises:

a rotary damper fixedly connected to a side wall of the enclosure;
a gear fixedly connected to a damping rotation shaft of the rotary damper;
an arc-shaped rack fixedly connected to the side wall of the storage box body and meshing with the gear.

[0013] Optionally, the storage box further comprises a buffer structure which is a rubber member disposed on the enclosure.

[0014] To achieve the above object of the invention, an embodiment provides a refrigerator, comprising a door body, a storage box is disposed on an inner side of the door body; the storage box comprises an enclosure, a storage box body, a pivot shaft connected to the enclosure and the storage box body, the storage box further comprising:

an elastic element disposed between the pivot shaft and the enclosure, the elastic element always providing a driving force driving the storage box body to turn outwards the enclosure about the pivot shaft;
a locking device comprising a locking portion and a fitting portion which is push-fitted with the locking portion, where one of the locking portion and the fitting portion is disposed on the enclosure, and the other is disposed on the storage box body.

[0015] Optionally, the elastic element is a torsion spring, the torsion spring comprises a spring body, and a spring arm connected to the spring body, and the spring body is sleeved on the pivot shaft.

[0016] Optionally, the enclosure comprises a fixing portion connected to a side wall of the enclosure, the fixing portion is provided with a through hole, and the spring arm passes through the through hole.

[0017] Optionally, the fitting portion is a lock tongue

provided on a rear wall of the storage box body, and the locking portion is a push lock provided on a rear wall of the enclosure.

[0018] Optionally, the push lock comprises a first force receiving portion, a second force receiving portion, and a resisting portion, the first force receiving portion causes the resisting portion to release the lock tongue, and the second force receiving portion causes the resisting portion to clamp the lock tongue.

[0019] Optionally, the resisting portion is provided with a first protrusion, and the lock tongue is provided with a second protrusion.

[0020] Optionally, the storage box further comprises a damping device connected to the enclosure and the storage box body, and the damping device provides a resistance against the turn of the storage box body outward the enclosure.

[0021] Optionally, the damping device comprises:

a rotary damper fixedly connected to a side wall of the enclosure;
a gear fixedly connected to a damping rotation shaft of the rotary damper;
an arc-shaped rack fixedly connected to the side wall of the storage box body and meshing with the gear.

[0022] Optionally, the storage box further comprises a buffer structure which is a rubber member disposed on the enclosure.

[0023] As compared with the prior art, the present utility model has the following advantageous effects: the elastic element is fitted with the locking device so that the storage box body can turn automatically; the storage box needn't be provided with a handle, thereby expanding the space for storing items, and the user needn't manually open the storage box so that his experience can be improved.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024]

FIG. 1 is a side view of a storage box in an embodiment of the present utility model;
FIG. 2 is a structural schematic diagram of an enclosure in an embodiment of the present utility model;
FIG. 3 is an enlarged schematic diagram of position A of FIG. 2;
FIG. 4 is an enlarged schematic diagram of position B of FIG. 2;
FIG. 5 is an enlarged schematic diagram of position C of FIG. 2;
FIG. 6 is a structural schematic diagram of a storage box body in an embodiment of the present utility model;
FIG. 7 is a structural schematic structural view showing that a storage box is disposed on a refrigerator door body in an embodiment of the present utility model.

DETAILED DESCRIPTION

[0025] The present utility model will be described in detail below in conjunction with specific embodiments shown in the figures. However, these embodiments are not intended to limit the present utility model. Variations in structures, methods or functions made by those having ordinary skill in the art according to these embodiments all are included in the extent of protection of the present utility model.

[0026] In the figures of the present utility model, some dimensions of structures or parts will be enlarged relative to other structures or parts for the convenience of illustration. Therefore, the figures are only used to illustrate the basic structures of the subject matter of the present utility model.

[0027] Referring to FIG. 1, the present utility model provides a storage box 20, comprising an enclosure 21, a storage box body 22, a pivot shaft 23 connected to the enclosure 21 and the storage box body 22, an elastic element, and a locking device.

[0028] The storage box body 22 is formed with a cavity for storing items, the enclosure 21 has an opening on one side, and the storage box body 22 is turnable outward about the pivot shaft 23 from the opening to open.

[0029] Referring to FIG. 2 through FIG. 6, in the present embodiment, the pivot shaft 23 is fixedly disposed on side walls of the enclosure 21, the side walls of the storage box body 22 are each provided with a pivot hole 221, the pivot shaft 23 is inserted into the pivot holes 221, and the pivot shaft 23 rotates in the pivot holes 221 so that the storage box body 22 pivots relative to the enclosure 21, thereby helping the user to take out the items from the storage box body 22.

[0030] The elastic element is disposed between the pivot shaft 23 and the enclosure 21, and the elastic element always provides a driving force driving the storage box body 22 to turn outwards the enclosure 21 about the pivot shaft 23. When a user needs to take an item, the storage box body 22 can be automatically opened under the action of the elastic element, and the user needn't manually open the storage box body 22, so that the user experience can be improved.

[0031] Specifically, the elastic element is a torsion spring 25. The torsion spring 25 comprises a spring body 251, and a spring arm 252 connected to the spring body 251. The spring body 251 is sleeved on the pivot shaft 23. When the storage box body 22 is in a closed state, the spring body 251 is in a torsional energy-storing state, and the elastic potential energy can be continuously released while the spring body 251 drives the storage box body 22 to open. At the same time, the torsion spring 25 can make the storage box body 22 in an open state, and the user may take items out of the cavity without holding the storage box body.

[0032] Further, the enclosure 21 comprises a fixing

portion 213 connected to the side wall of the enclosure 21, the fixing portion 213 is provided with a through hole, the spring arm 252 passes through the through hole, and the through hole catches the spring arm 252, thereby improving the stability of the torsion spring 25.

[0033] The locking device can lock or unlock the enclosure 21 to the storage box body 22. It may be appreciated that when the locking device locks, the elastic element cannot make the storage box body 22 open, so that the closeness of the storage box 20 may be maintained; when the locking device unlocks, the elastic element can make the storage box body 22 open, which is convenient for users to use.

[0034] Specifically, the locking device comprises a locking portion and a fitting portion which is push-fitted with the locking portion. One of the locking portion and the fitting portion is disposed on the enclosure 21, and the other is disposed on the storage box body 22.

[0035] The fitting portion is a lock tongue 222 provided on a rear wall of the storage box body 22, and the locking portion is a push lock 211 provided on a rear wall of the enclosure 21. When the storage box body 22 is in the closed state, the lock tongue 222 extends into the push lock 211; when the storage box body 22 is in the open state, the lock tongue 222 separates from the push lock 211.

[0036] The push lock 211 comprises a first force receiving portion 2111, a second force receiving portion 2113, and a resisting portion 2112. The first force receiving portion 2111 causes the resisting portion 2112 to release the lock tongue 222, and the second force receiving portion 2113 causes the resisting portion 2112 to clamp the lock tongue 222.

[0037] When the storage box body 22 is in the closed state, the user may apply a push elastic force to any position of the front wall of the storage box body 22, and the push elastic force may be transferred to the first force receiving part 2111 to cause the resisting portion 2112 to release the lock tongue 222 to open the storage box body 22. When the storage box body 22 is closed, after the lock tongue 222 contacts the second force receiving portion 2113, the resisting portion 2112 clamps the lock tongue 222.

[0038] Preferably, the resisting portion 2112 is provided with a first protrusion, and the lock tongue 222 is provided with a second protrusion. When the storage box 20 is in the closed state, the first protrusion abuts against the second protrusion so that the second protrusion cannot cross the first protrusion, such that the lock tongue 222 is locked in the push lock 211.

[0039] Further, the storage box 20 further comprises a damping device 24 connected to the enclosure 21 and the storage box body 22, and the damping device 24 provides a resistance against the turn of the storage box body 22 outward the enclosure 21. During the opening process of the storage box body 22, the damping device 24 can reduce a turning speed of the storage box body 22, so that the storage box body 22 can slowly open and the storage box body 22, thereby preventing damages of the storage box body 22 and the enclosure 21 caused by the storage box body 22 violently stroking the enclosure 21 due to an excessive turning speed.

[0040] Specifically, the damping device 24 comprises a rotary damper 242, a gear 243, and an arc-shaped rack 241. The rotary damper 242 is fixedly connected to a side wall of the enclosure 21, the gear 243 is fixedly connected to a damping rotation shaft 244 of the rotary damper 242, the arc-shaped rack 241 is fixedly connected to the side wall of the storage box body 22, and the arc-shaped rack 241 meshes with the gear 243.

[0041] During the opening of the storage box body 22, the arc-shaped rack 241 rotates and drives the gear 243 to rotate, then the gear 243 drives the damping rotation shaft 244 to rotate, the damping rotation shaft 244 has a rotational damping force, and the storage box body 22 receives the rotational damping force so that the opening speed of the storage box body 22 is reduced.

[0042] Furthermore, the storage box 20 further comprises a buffer structure. When the body of the storage box 20 turns inward the enclosure 21 about the pivot shaft 23, the buffer structure can further prevent damages caused by the storage box 20 body striking the enclosure 21, and reduce the noise generated when the storage box body 22 strikes the enclosure 21.

[0043] Specifically, the buffer structure is a rubber member 212 disposed on the enclosure 21. The rubber member 212 can cooperate with the front wall of the storage box body 22 to prevent the storage box body 22 from violently striking the enclosure 21. In other embodiments, the buffer structure may also be disposed on the storage box body 22, and may also be any of other members functioning to buffer, such as a sponge.

[0044] Referring to FIG. 7, the present utility model further provides a refrigerator, comprising a door body 10, wherein the storage box 20 is disposed on an inner side of the door body 10.

[0045] The detailed descriptions set forth above are merely specific illustrations of feasible embodiments of the present utility model, and are not intended to limit the scope of protection of the present utility model. All equivalent embodiments or modifications that do not depart from the art spirit of the present utility model should fall within the scope of protection of the present utility model.

Claims

1. A storage box, comprising an enclosure, a storage box body, a pivot shaft connected to the enclosure and the storage box body, wherein the storage box further comprises:

   an elastic element disposed between the pivot shaft and the enclosure, the elastic element always providing a driving force driving the storage box body to turn outwards the enclosure

about the pivot shaft;
a locking device comprising a locking portion and a fitting portion which is push-fitted with the locking portion, where one of the locking portion and the fitting portion is disposed on the enclosure, and the other is disposed on the storage box body.

2. The storage box according to claim 1, wherein the elastic element is a torsion spring, the torsion spring comprises a spring body, and a spring arm connected to the spring body, and the spring body is sleeved on the pivot shaft.

3. The storage box according to claim 2, wherein the enclosure comprises a fixing portion connected to a side wall of the enclosure, the fixing portion is provided with a through hole, and the spring arm passes through the through hole.

4. The storage box according to claim 1, wherein the fitting portion is a lock tongue provided on a rear wall of the storage box body, and the locking portion is a push lock provided on a rear wall of the enclosure.

5. The storage box according to claim 4, wherein the push lock comprises a first force receiving portion, a second force receiving portion, and a resisting portion, the first force receiving portion causes the resisting portion to release the lock tongue, and the second force receiving portion causes the resisting portion to clamp the lock tongue.

6. The storage box according to claim 5, wherein the resisting portion is provided with a first protrusion, and the lock tongue is provided with a second protrusion.

7. The storage box according to claim 1, wherein the storage box further comprises a damping device connected to the enclosure and the storage box body, and the damping device provides a resistance against the turn of the storage box body outward the enclosure.

8. The storage box according to claim 7, wherein the damping device comprises:

a rotary damper fixedly connected to a side wall of the enclosure;
a gear fixedly connected to a damping rotation shaft of the rotary damper;
an arc-shaped rack fixedly connected to the side wall of the storage box body and meshing with the gear.

9. The storage box according to claim 1, wherein the storage box further comprises a buffer structure which is a rubber member disposed on the enclosure.

10. A refrigerator, comprising a door body, wherein the storage box according to claim 1 is disposed on an inner side of the door body.

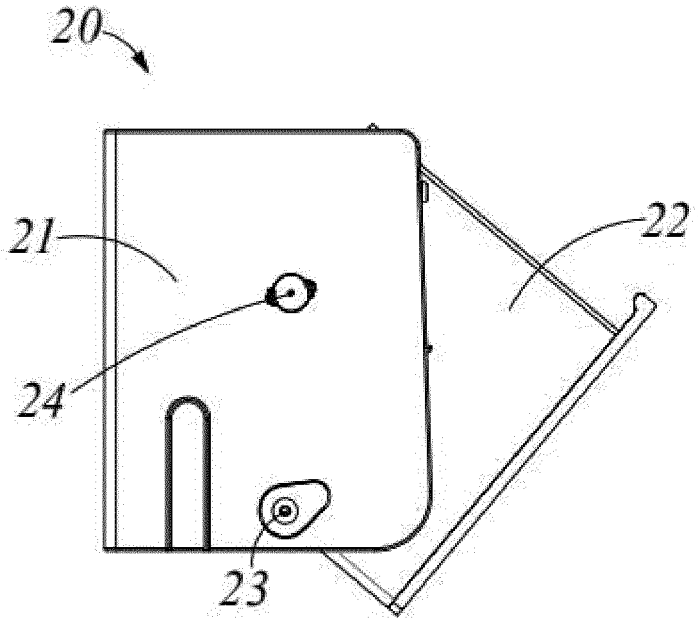

Fig. 1

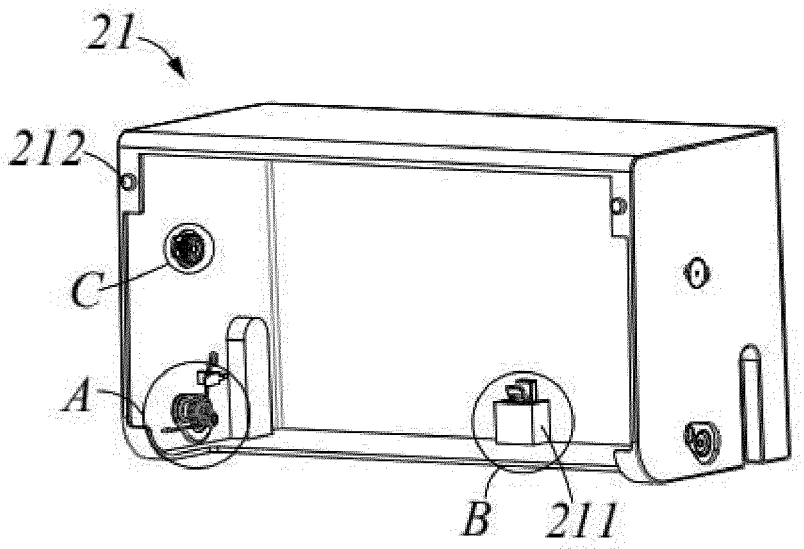

Fig. 2

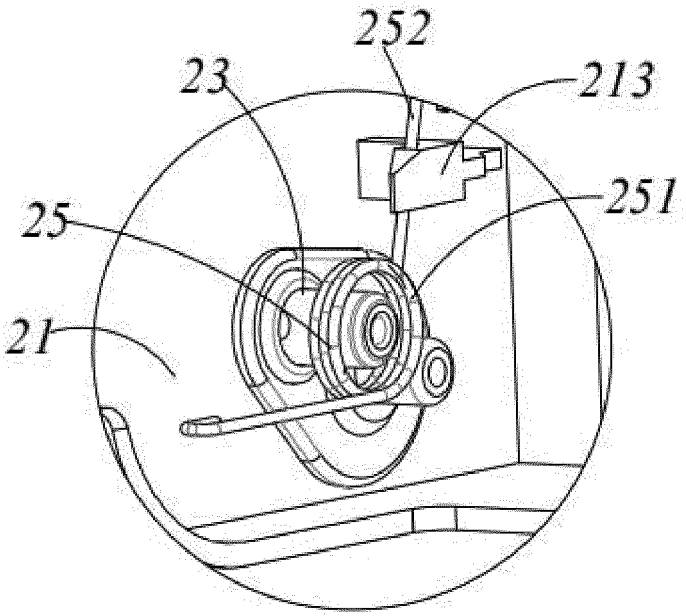

Fig. 3

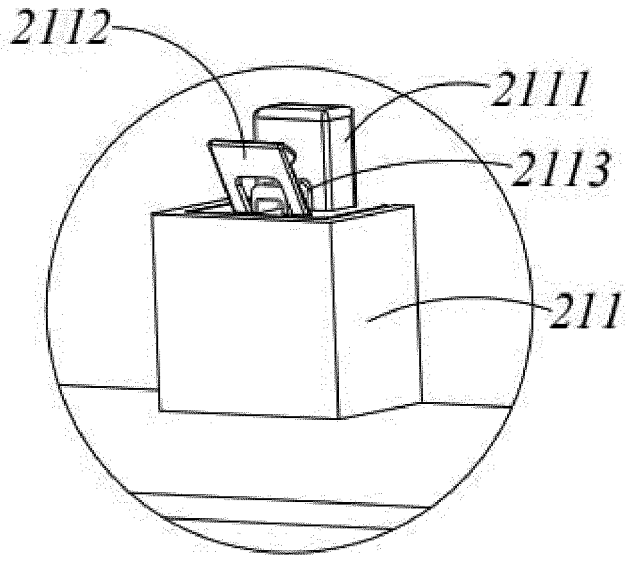

Fig. 4

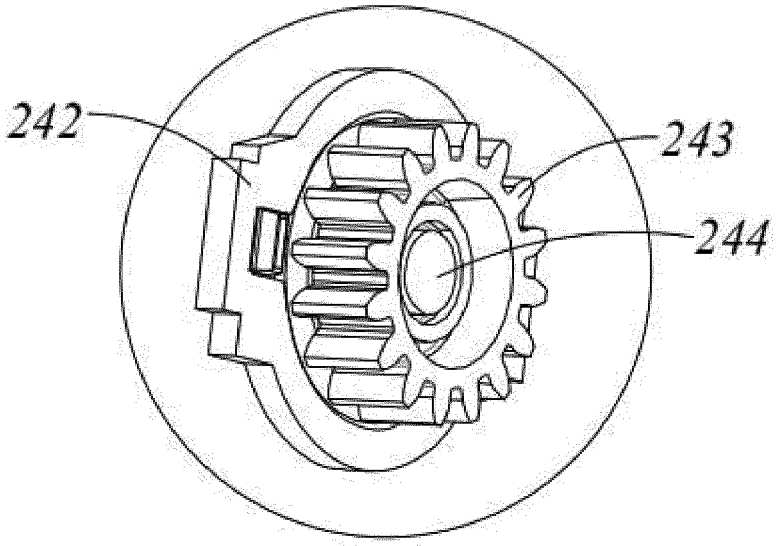

Fig. 5

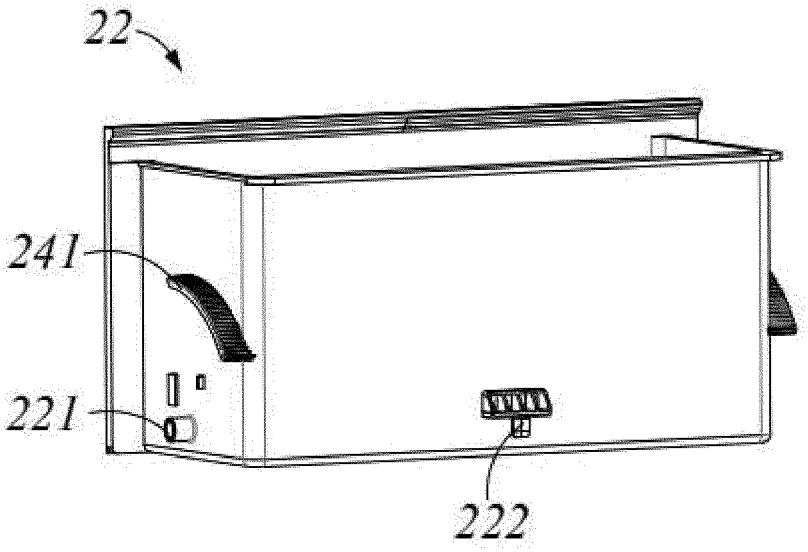

Fig. 6

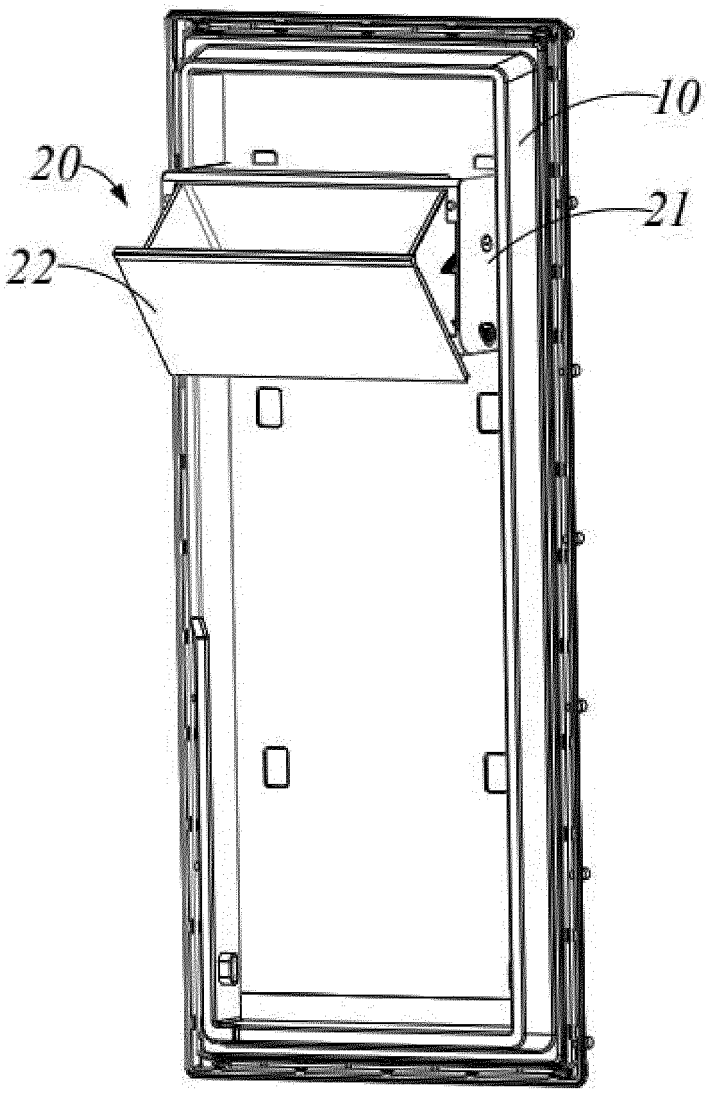

Fig. 7

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2021/070215

A. CLASSIFICATION OF SUBJECT MATTER

F25D 25/00(2006.01)i; F25D 25/02(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)

F25D

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, CNKI, 读秀, 超星科技数字图书馆, DWPI, SIPOABS, USTXT, EPTXT: 青岛海尔电冰箱有限公司, 马明明, 付伟健, 张珩, 刘文龙, 冰箱, 储物盒, 盒, 箱, 弹性, 弹簧, 轴, 锁紧, 锁定, 扭簧, 锁舌, 阻尼, 齿轮, 齿条, 缓冲, refrigerator, storage, box, elastic, spring, axis, lock+, damp+, gear, rack, cushion

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Y	CN 106568289 A (QINGDAO HAIER CO., LTD.) 19 April 2017 (2017-04-19) description, paragraphs 32-81, and figures 1-6	1-10
PX	CN 212205306 U (QINGDAO HAIER REFRIGERATOR CO., LTD. et al.) 22 December 2020 (2020-12-22) claims 1-10	1-10
A	CN 102538373 A (HEFEI MIDEA RONGSHIDA REFRIGERATOR CO., LTD. et al.) 04 July 2012 (2012-07-04) entire document	1-10
A	CN 104344676 A (HAIER GROUP CORP. et al.) 11 February 2015 (2015-02-11) entire document	1-10
A	CN 103541614 A (SAMSUNG ELECTRONICS CO., LTD.) 29 January 2014 (2014-01-29) 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
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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
15 March 2021	**26 March 2021**

Name and mailing address of the ISA/CN	Authorized officer
China National Intellectual Property Administration (ISA/CN) **No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088** **China**	
Facsimile No. **(86-10)62019451**	Telephone No.

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

INTERNATIONAL SEARCH REPORT

International application No.
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C. DOCUMENTS CONSIDERED TO BE RELEVANT

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

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
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