

(19)



(11)

EP 3 149 412 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention of the grant of the patent:

08.05.2019 Bulletin 2019/19

(51) Int Cl.:

F25D 23/02 ^(2006.01)

(21) Application number: **14728515.9**

(86) International application number:

PCT/EP2014/061311

(22) Date of filing: **02.06.2014**

(87) International publication number:

WO 2015/185078 (10.12.2015 Gazette 2015/49)

(54) **REFRIGERATION APPLIANCE WITH A DOOR-IN-DOOR STRUCTURE**

KÄLTEVORRICHTUNG MIT EINER TÜR-IN-TÜR-STRUKTUR

APPAREIL FRIGORIFIQUE DOTÉ D'UNE STRUCTURE DE PORTE INTÉGRÉE DANS UNE PORTE

(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**

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(43) Date of publication of application:

05.04.2017 Bulletin 2017/14

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Description

[0001] The present invention relates to a refrigeration appliance having a first door with an opening to which a second door is hinge connected in a pivoting manner.

[0002] A refrigerator having an enlarged storage compartment may comprise a cabinet with a freezer compartment and a refrigeration compartment, each compartment having a respective door at the front of the cabinet allowing access thereto. A refrigeration appliance has a plurality of shelves and containers for preserving food items. A plurality of withdrawable containers are also arranged in the manner that the bases thereof extends in parallel with the ground so as to be movable out of the internal space of the appliance in order for allowing the users to reach the stored food items.

[0003] A second door can be provided in the refrigeration compartment door such that one can open the second door to gain access into the internal space without necessarily having to open the first door. This provides the additional freedom to put and remove food into and from the refrigeration compartment in a more practical manner.

[0004] As the opened position of the second door can be used as a carrier shelf, it is expected that it can withstand relatively heavy loads such as large pans filled with food. To this end, a design option may be suggested as making use of a pair of hinge brackets either articulated or not, extending between the pivoting door and the side surfaces of the door frame to support the door in its open position when pivoted down to an horizontal plane. It is, however, to be noted that such hinge brackets with their bulky structures do not particularly present an attractive appearance.

[0005] Among others, one of the prior art disclosures in the technical field of the present invention can be referred to as US5209082, which defines a multi-purpose refrigerator with a main door and a fresh storage compartment mounted on a rear side of said main door and being accessible through an auxiliary door formed in the main door. The fresh storage compartment comprises a multi-section housing mounted to a pair of vertical walls disposed on the rear or inner side of the main door. Each housing section includes front and rear portions. The front portion fits between the walls. The rear portion is wider than the front portion to form shoulders therebetween. The shoulders carry hooks which fit removably into slots formed in rearwardly facing edges of the walls. The housing has openable apertures to communicate the refrigerator compartment with the fresh storage compartment.

[0006] Prior art document US 2006/119240 describes a refrigerator having a door and in that door an auxiliary door which extends horizontally in an opened state. In the opened state, a horizontally extending flange of the auxiliary door abuts against a horizontally extending flange of the refrigerator's door.

[0007] The present invention on the other hand pro-

vides a refrigeration appliance having a first door with an opening to which a second door is hinge connected in a robust and sturdy manner so that the second door can reliably carry relatively heavy loads.

[0008] The present invention therefore provides a refrigeration appliance with a door hinge connected to a main door in a mechanically reliable manner as provided by the characterizing features defined in Claim 1.

[0009] Primary object of the present invention is to provide a refrigeration appliance having a door hinge connected to a main door and which can reliably carry relatively heavy loads.

[0010] The present invention proposes a refrigeration appliance having a refrigeration appliance door and an auxiliary access door being connected to an auxiliary door frame in a pivoting manner. An inclined contact surface supports the auxiliary access door in its opened position such that when the latter presses against the auxiliary door frame at the inclined contact surface, a first and second reinforcement elements behind external cover parts of the auxiliary access door and the auxiliary door frame respectively therein are positioned in parallel alignment so as to support the auxiliary access door around the inclined contact surface.

[0011] The edge of the auxiliary access door communicating with the auxiliary door frame has a contact surface inclination in the manner that a projecting part of the auxiliary access door is movable into an internal cavity of the auxiliary door frame in a position closest to the base of the refrigeration appliance in opened position of the auxiliary access door. Further, a protruding member provided on the auxiliary access door inter-engages with a frame recess of the auxiliary door frame in the opened position of the auxiliary access door.

[0012] Accompanying drawings are given solely for the purpose of exemplifying a refrigeration appliance with an auxiliary access door, whose advantages over prior art were outlined above and will be explained in brief hereinafter. The drawings are not meant to delimit the scope of protection as identified in the claims nor should they be referred to alone in an effort to interpret the scope identified in said claims without recourse to the technical disclosure in the description of the present invention.

Fig. 1 demonstrates a general perspective view of a refrigeration appliance door having an auxiliary access door according to the present invention.

Fig. 2 demonstrates a general perspective view of a refrigeration appliance door with an auxiliary access door in opened position according to the present invention.

Fig. 3 demonstrates a lateral cross-sectional view of the auxiliary access door in opened position relative to the auxiliary door frame according to the present invention.

Fig. 4 demonstrates a general perspective view of the auxiliary access door in opened position relative to the auxiliary door frame according to background

art.

Fig. 5 demonstrates a general perspective view of the auxiliary access door according to background art.

Fig. 6 demonstrates a lateral cross-sectional view of the auxiliary access door in opened position relative to the auxiliary door frame along a plane across a protruding member of the auxiliary access door engaging with a frame recess of the auxiliary door frame according to background art.

[0013] The following numerals are assigned to different parts demonstrated in the drawings:

1. Refrigeration appliance door
2. Auxiliary access door
3. Auxiliary door frame
4. Access opening
5. Contact surface
6. First reinforcement element
7. Second reinforcement element
8. Protruding member
9. Frame recess
10. Door hinge
11. Projecting part
12. Internal cavity

[0014] The present invention proposes a refrigeration appliance typically having a cabinet with a multitude of storage compartments associated with respective doors opening a front side of said cabinet. A refrigerating compartment as well as a freezing compartment may be disposed so as to provide two separate divisions within the inside of the cabinet. The refrigerating and/or freezing compartments may comprise a plurality of shelves as well as withdrawable storage containers generally designated as a storage space for food items such as vegetables and fruits.

[0015] According to the present invention, a refrigeration appliance having a first door (refrigeration appliance door, 1) with an access opening (4) to which a second door (auxiliary access door, 2) is hinge connected in a pivoting manner is proposed. The auxiliary access door (2) typically provides that one can open the same in order for gaining access into the inside of the refrigeration compartment without having to open the refrigeration appliance door (1).

[0016] Due to the fact that the opened position of the auxiliary access door (2) is also used as a temporary shelf, the auxiliary access door (2) needs to be able to carry relatively heavy loads such as large pans filled with food. In this regard, the present invention provides that an inclined contact surface (5) is formed between the auxiliary access door (2) and the auxiliary door frame (3) such that a larger contact area and therefore support surface can be obtained at the fully opened position of the auxiliary access door (2).

[0017] The inclined contact surface (5) is designed

such that the auxiliary access door (2) bears against said inclined contact surface (5) of the auxiliary door frame (3) while a first and second reinforcement elements (6, 7) are aligned respectively in the auxiliary access door (2) and the auxiliary door frame (3). The first and second reinforcement elements (6, 7) in the form of sheet-like planar elements, respectively mounted behind external cover parts of the auxiliary access door (2) and the auxiliary door frame (3) and so as to be extending substantially in parallel with each other provides that said auxiliary access door (2) is reinforced and supported against relatively high-impact forces.

[0018] As is seen in Fig. 3 demonstrating a lateral cross-sectional view of the auxiliary access door (2) in opened position relative to the auxiliary door frame (3), the contact surface (5) where the auxiliary access door (2) presses against the auxiliary door frame (3) is backed and supported by the first and second reinforcement elements (6, 7) at both sides of the contact surface (5). Further, the contact surface (5) being inclined, that is, not perpendicular to the plane in which the auxiliary access door (2) extends in opened horizontal position, while allowing for a larger contact surface area, additionally enables that larger reinforcement elements can be installed.

[0019] In accordance with the present invention, the lower edge of the auxiliary access door (2) hingedly communicating with the auxiliary door frame (3) has a contact surface (5) inclination such that the innermost projecting part (11) of the auxiliary access door (2) in opened position reaches an internal cavity (12) of the auxiliary door frame (3), the projecting part (11) also forming the lowermost part of the auxiliary access door (2) in non-opened position. In other words, the contact surface (5) is inclined in the direction of the projecting part (11) and the internal cavity (12). This inclinational aspect of the contact surface (5) ensures a visually smooth flat-surface appearance when the auxiliary access door (2) is closed as the projecting part (11) extends adjacent to the auxiliary door frame (3) in this position.

[0020] Another measure, which is not part of the present invention, to provide the auxiliary access door (2) with relatively heavy load endurance, sturdy structure and durability is that a pair of protruding members (8) on the auxiliary access door (2) engages with respective frame recesses (9) of the auxiliary door frame (3) in the opened position of the auxiliary access door (2). As seen in Fig. 6 demonstrating a lateral cross-sectional view of the auxiliary access door (2) in opened position along a plane across which a protruding member (8) engages with a frame recess (9), the downward rotation of the auxiliary access door (2) is stopped by the frame recesses (9) receiving the protruding members (8) and as such it is provided, additional to the stopping effect of the inclined contact surface (5), a robust mechanical durability for the auxiliary access door (2).

[0021] In a nutshell, the present invention proposes a refrigeration appliance having a refrigeration appliance

door (1) and a cabinet with at least one storage compartment associated with the refrigeration appliance door (1) opening a front side of the cabinet, said at least one storage compartment comprising a plurality of shelves for carrying and preserving food items, the refrigeration appliance door (1) having an auxiliary access door (2) being connected to an auxiliary door frame (3) in a pivoting manner.

[0022] An inclined contact surface (5) is formed between the auxiliary access door (2) and the auxiliary door frame (3) at the fully opened position of the auxiliary access door (2) relative to the auxiliary door frame (3). Said inclined contact surface (5) is configured such that the auxiliary access door (2) bears against the inclined contact surface (5) of the auxiliary door frame (3) while a first and second reinforcement elements (6, 7) are aligned respectively in the auxiliary access door (2) and the auxiliary door frame (3).

[0023] In an embodiment of the present invention, the first and second reinforcement elements (6, 7) in the form of sheet-like planar elements are respectively mounted in the auxiliary access door (2) and the auxiliary door frame (3) extending substantially in parallel with each other.

[0024] In the present invention, the first and second reinforcement elements (6, 7) are mounted behind external cover parts of the auxiliary access door (2) and the auxiliary door frame (3).

[0025] In the present invention, the edge of the auxiliary access door (2) hingedly communicating with the auxiliary door frame (3) has a contact surface (5) inclination such that a projecting part (11) of the auxiliary access door (2) is inserted in the direction of an internal cavity (12) of the auxiliary door frame (3) in a position closest to the base of the refrigeration appliance in opened position of the auxiliary access door (2).

[0026] In a yet still further embodiment of the present invention, the projecting part (11) forms the closest part of the auxiliary access door (2) to the base of the refrigeration appliance in non-opened position.

[0027] The present invention therefore proposes a refrigeration appliance having a first door with an access opening (4) to which the auxiliary access door (2) is hinge connected in a robust and sturdy manner whereby the auxiliary access door (2) is imparted relatively heavy load endurance, sturdy structure and durability.

Claims

1. A refrigeration appliance having a refrigeration appliance door (1) and a cabinet with at least one storage compartment associated with said refrigeration appliance door (1) opening a front side of said cabinet, said at least one storage compartment comprising a plurality of shelves for carrying and preserving food items, the refrigeration appliance door (1) having an auxiliary access door (2) being connected to

an auxiliary door frame (3) in a pivoting manner, **characterized in that**

- a contact surface (5) of the auxiliary door frame (3) is inclined, said inclined contact surface (5) not being perpendicular to the plane in which the auxiliary access door (2) extends in fully opened horizontal position;
- the inclined contact surface (5) is configured such that the auxiliary access door (2) bears against it while a first and a second reinforcement element (6, 7) are aligned respectively in the auxiliary access door (2) and the auxiliary door frame (3),
- the first and second reinforcement elements (6, 7) are respectively mounted in the auxiliary access door (2) and the auxiliary door frame (3) extending substantially in parallel with each other while the door is in open position;
- the first and second reinforcement elements (6, 7) are mounted behind external cover parts of the auxiliary access door (2) and the auxiliary door frame (3);
- the edge of the auxiliary access door (2) hingedly communicating with the auxiliary door frame (3) has an inclination such that a projecting part (11) of the auxiliary access door (2) is movable into an internal cavity (12) of the auxiliary door frame (3) in a position closest to the base of the refrigeration appliance in opened position of the auxiliary access door (2).

2. A refrigeration appliance as in Claim 1, **characterized in that** the first and second reinforcement elements (6, 7) are in the form of sheet-like planar elements.
3. A refrigeration appliance as in Claim 1 or 2, **characterized in that** the projecting part (11) forms the closest part of the auxiliary access door (2) to the base of the refrigeration appliance in non-opened position.

Patentansprüche

1. Ein Kühlgerät besitzt eine Kühlgerättür (1) und ein Gehäuse, mit mindestens einem Aufbewahrungsfach, dass an dem Kühlgerättür (1) angeordnet ist und sich an der Vorderseite befindet, des Weiteren besitzt das Aufbewahrungsfach mindestens eine bis zu mehrere Regale, die für das Tragen und Konservieren von Lebensmitteln zuständig sind, wobei die Kühlgerättür (1) gemeinsam mit einer Zusatzhilfstür (2) schwenkbar an einem Türrahmen (3) verbunden ist, **und gekennzeichnet dadurch,**

- **dass** die Kontaktfläche (5) von dem Türrahmen

(3) geneigt ist, wobei die geneigte Kontaktfläche (5) sich nicht senkrecht zu der Ebene befindet, in der sich die Hilfszugangstür in einer vollständig geöffneten und horizontalen Position erstreckt;

- **dass** die geneigte Kontaktfläche (5) so konfiguriert ist, dass die Hilfszugangstür (2) an ihr anliegt, während ein erstes und zweites Verstärkungselement (6, 7) in der Hilfszugangstür (2) und der Hilfstürrahmen (3) ausgerichtet sind;

- **dass** das erste und zweite Verstärkungselement (6, 7) jeweils in der Hilfszugangstür (2) und dem Hilfstürrahmen (3) angebracht sind, die sich parallel zueinander erstrecken, während sich die Tür in der offenen Position befindet;

- **dass** das erste und zweite Verstärkungselement (6, 7) sich hinter den äußeren Abdeckungsteilen der Hilfszugangstür (2) und des Hilfstürrahmen (3) befinden;

- **dass** die Kante der Hilfszugangstür (2), die gelenkig mit dem Hilfstürrahmen (3) verbunden ist, so geneigt ist, dass ein vorspringender Teil (11) der Hilfszugangstür (2) in einen inneren Hohlraum (12) hinein verschiebbar ist und der Hilfstürrahmen (3) sich in einer Position befindet, die der Basis des Kühlgeräts am nächsten ist, wenn die Position der Zusatzhilfstür (2) geöffnet ist.

2. Ein Kühlgerät, wie in Anspruch 1 aufgeführt, **ist dadurch gekennzeichnet, dass** das erste und zweite Verstärkungselement (6,7) als folienartige Flächenelemente ausgebildet ist.

3. Ein Kühlgerät, wie in Anspruch 1 oder 2 aufgeführt, **ist dadurch gekennzeichnet, dass** der vorspringende Teil (11) sich in nicht geöffneten Position mit dem nächstgelegenen Teil der Zusatzhilfstür (2) den Boden des Kältegeräts bildet.

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plan dans lequel la porte d'accès auxiliaire (2) s'étend en position horizontale complètement ouverte ;

- la surface de contact inclinée (5) est configurée de telle sorte que la porte d'accès auxiliaire (2) s'appuie contre elle tandis qu'un premier et un deuxième élément de renforcement (6, 7) sont alignés respectivement dans la porte d'accès auxiliaire (2) et le cadre de porte auxiliaire (3),

- les premier et second éléments de renforcement (6, 7) sont respectivement montés dans la porte d'accès auxiliaire (2) et le cadre de porte auxiliaire (3) s'étendant sensiblement parallèlement l'un à l'autre lorsque la porte est en position ouverte ;

- les premier et second éléments de renforcement (6, 7) sont montés derrière des parties de recouvrement extérieures de la porte d'accès auxiliaire (2) et du cadre de porte auxiliaire (3) ;

- le bord de la porte d'accès auxiliaire (2) communiquant de manière articulée avec le cadre de porte auxiliaire (3) présente une inclinaison telle qu'une partie saillante (11) de la porte d'accès auxiliaire (2) est mobile dans une cavité interne (12) du cadre de porte auxiliaire (3) dans une position proche de la base de l'appareil de réfrigération dans la position ouverte de la porte d'accès auxiliaire (2).

2. Un appareil de réfrigération selon la déclaration 1, **est caractérisé en ce que** les premier et second éléments de renforcement (6, 7) sont sous la forme d'éléments plans en forme de plaques.

3. Un appareil de réfrigération selon la déclaration 1 ou 2, **est caractérisé en ce que** la partie saillante (11) forme la partie de la porte d'accès auxiliaire (2) la plus proche de la base de l'appareil de réfrigération en position non ouverte.

Revendications

1. Un appareil de réfrigération ayant une porte d'appareil de réfrigération (1) et une armoire avec au moins un compartiment de rangement associé à ladite porte d'appareil de réfrigération (1) ouvrant une face avant de ladite armoire, ledit au moins un compartiment de rangement comprenant une pluralité de rayons pour porter et conserver des aliments, la porte (1) d'appareil de réfrigération ayant une porte auxiliaire (2) d'accès reliée à un cadre auxiliaire (3) de porte, de manière pivotante, **est caractérisé en ce que**

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- une surface de contact (5) du cadre de porte auxiliaire (3) est inclinée, ladite surface de contact inclinée (5) n'étant pas perpendiculaire au

Fig. 1

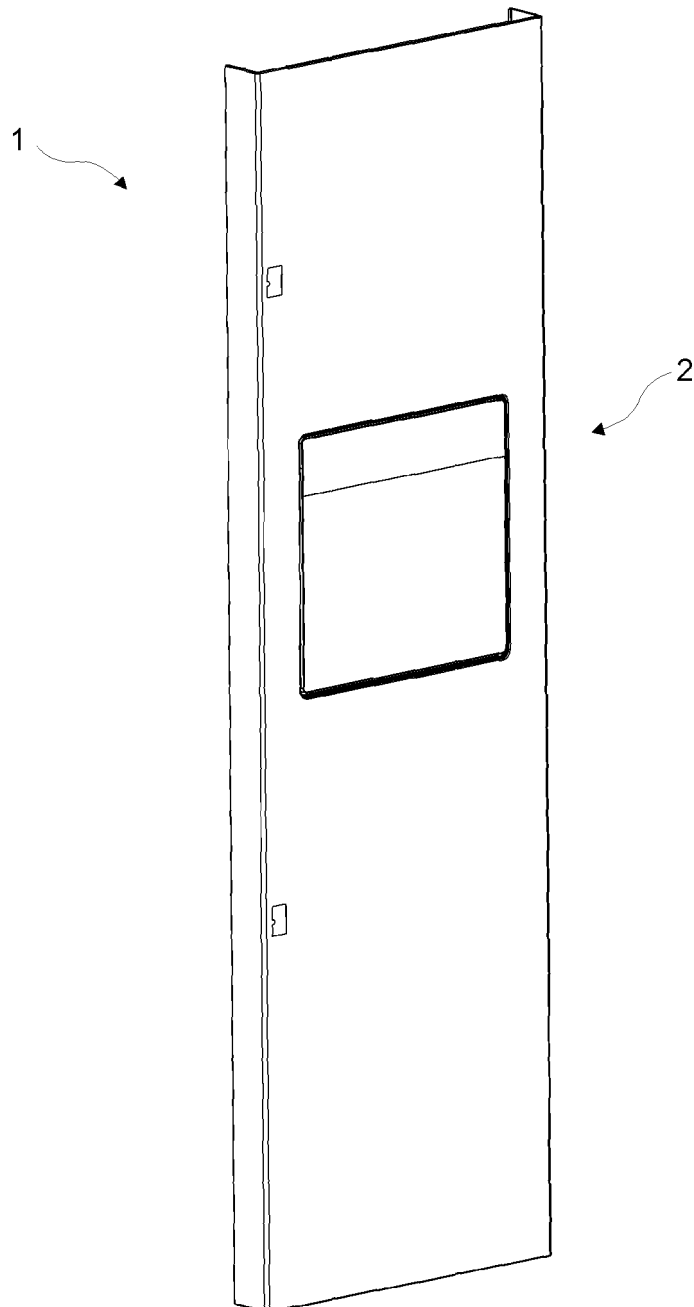


Fig. 2

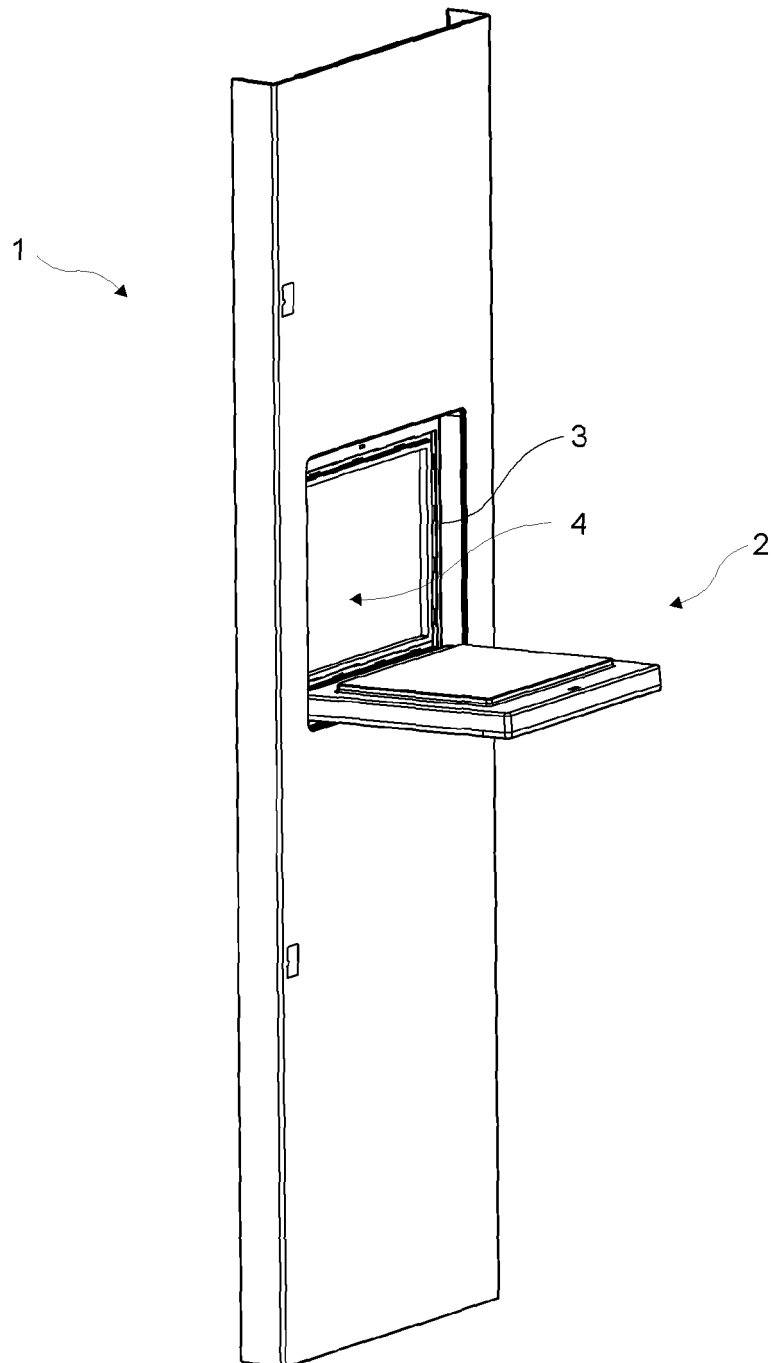


Fig. 3

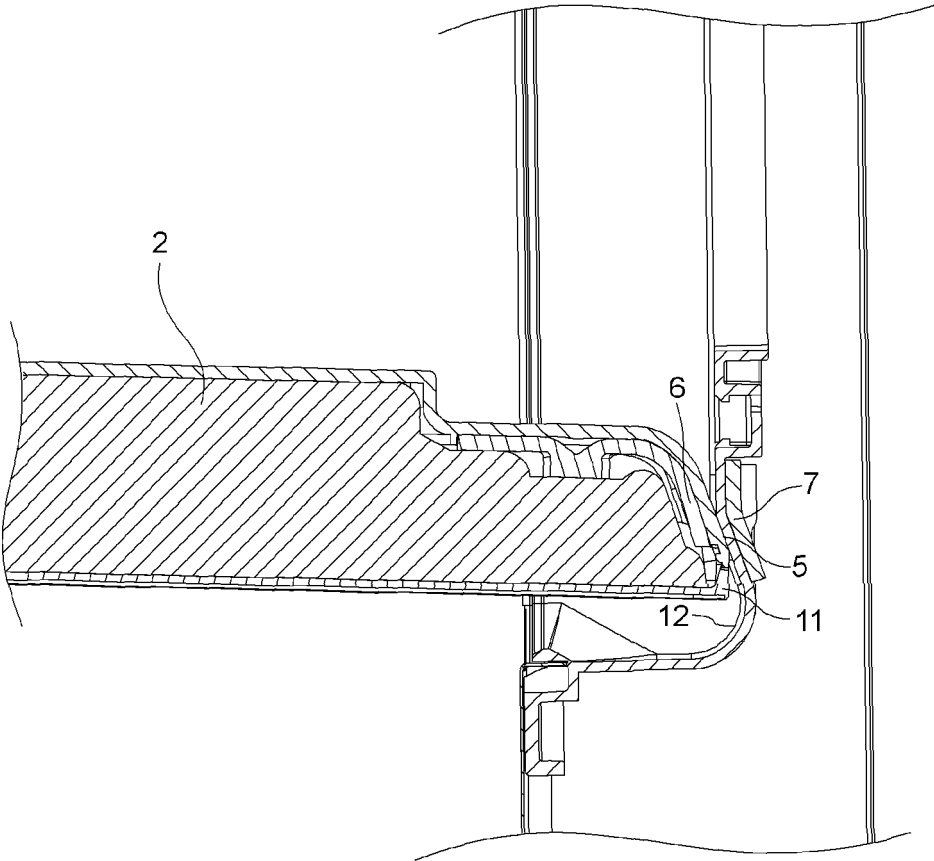


Fig. 4

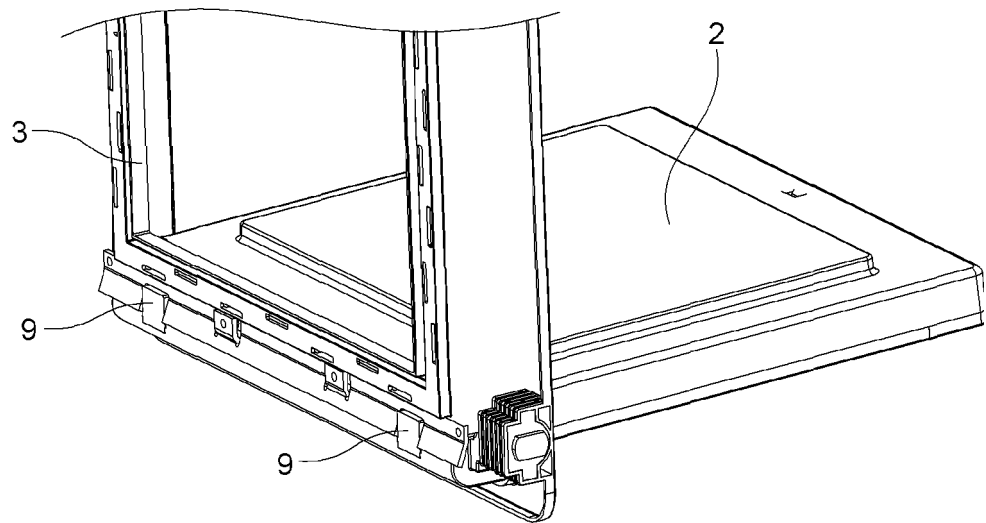


Fig. 5

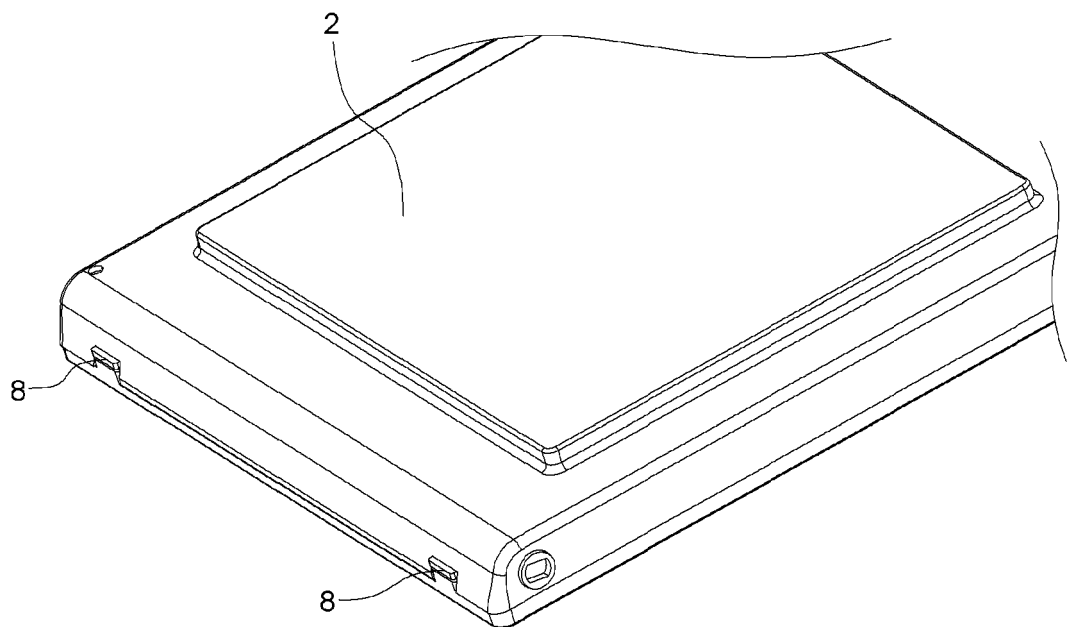
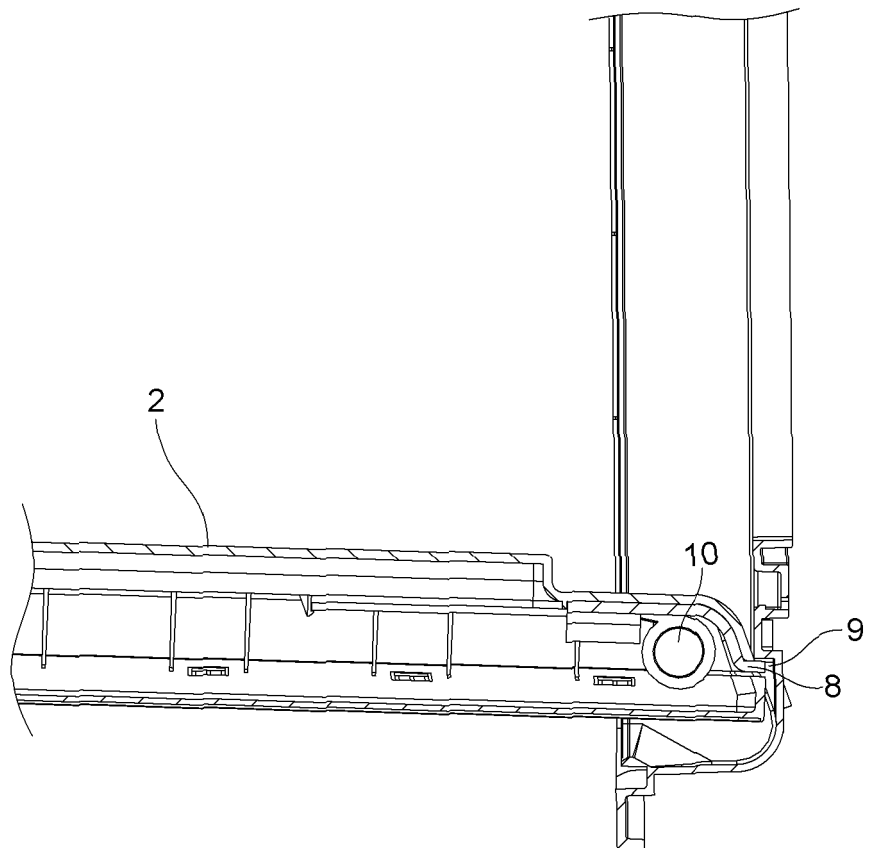


Fig. 6



REFERENCES CITED IN THE DESCRIPTION

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