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(54) A COOLING DEVICE COMPRISING A DRAWER

KÜHLVORRICHTUNG MIT EINER SCHUBLADE

DISPOSITIF DE REFROIDISSEMENT COMPORTANT UN TIROIR

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Description

[0001] The present invention relates to a cooling device comprising a drawer.

[0002] Generally, refrigerators comprise a fresh food compartment and a freezing compartment kept at different temperatures. In recent years, in accordance with customer demands, embodiments wherein the freezing compartment is situated below and the fresh food compartment is situated above have become widespread. In refrigerators wherein the freezing compartment is situated below, the freezing compartment is designed in the form of a drawer so as to be easily accessed from above. In order to close and open the drawers, various mechanisms consisting of rails and wheels are used. In these mechanisms, in cases wherein the rails do not move together, structural problems such as distortion, breaking and axial escape occur in the drawer and/or movement mechanism in course of time. Various methods are developed for the solution of the said problems, however in these methods either an additional element is required to be used or the volume of the compartment cannot be efficiently used. This causes the usable volume of the compartment wherein the drawer is situated to decrease and the deterioration in aesthetic appearance due to the complex mechanisms. The same problem is also observed in other cooling devices wherein a drawer is used.

[0003] In the state of the art International Patent Application No. WO2008051003, a cooling device is described comprising two pinions that move together with the drawer on a toothed rack. In this embodiment, the pinions are connected to each other by means of a shaft and disposed at the lower side of the drawer. The basket wherein items to be cooled are placed is detachably placed into the drawer.

[0004] In the state of the art Japanese Patent Application No. JP1305286, a cooling device is described comprising a pair of pinions disposed under the drawer and fixed on the side wall and a pair of toothed racks moving on the pinions. The pinions are positioned on the portion near the front side of the body. No shaft is disposed between the pinions and each pinion is driven by a motor.

[0005] The aim of the present invention is the realization of a cooling device wherein the compartment interior volume is used effectively.

[0006] The cooling device realized in order to attain the aim of the present invention, explicated in the first claim and the respective claims thereof, comprises at least two opposite pinions fixed on the side wall and at least two toothed racks that provide the drawer to which they are connected to move by moving on the pinions.

[0007] In the cooling device of the present invention, the pinions and the shaft are placed at the rear side of the mullion. Thus the usable volume of the drawer is increased. Since the pinions and the shaft, which are placed behind the mullion, cannot be seen by the user, an aesthetic external appearance is obtained.

[0008] In an embodiment of the present invention, gaps, wherein the pinions can be placed, are left at the corners of the mullion that face the inside of the compartment and a large portion of the shaft that connects the pinions to each other is passed through the mullion. Thus the pinion and the shaft do not occupy any space in the usable volume of the compartment.

[0009] In another embodiment of the present invention, oppositely placed channel shaped carriers are disposed on the side walls of the cooling device. The carriers are connected to the lid by means of the movement mechanism. The movement mechanism consists of arms that form a telescopic structure by sliding on each other.

[0010] In an embodiment of the present invention, the movement mechanism consists of three arms. The first arm is fixed into the carrier and the second arm to the lid. The third arm is connected to the first arm from one end and to the second arm from the other end. When the lid is pulled outwards, firstly the second arm moves inside the third arm and provides the drawer to extend outside slightly, and upon reaching the end of the third arm, the second arm moves the third arm and provides the third arm to move on the first arm and the drawer to be brought to the entirely open position.

[0011] In another embodiment of the present invention, a housing, whereinto the second arm is fixed, is disposed just above the toothed rack. After being placed into the housing, the second arm is fixed to the housing by means of the connection elements.

[0012] In another embodiment of the present invention, the cooling device comprises at least two support elements that provide the housing and the toothed rack to be mounted on the rear surface of the lid by being produced together as a single-piece. The support elements are oppositely mounted to the lower portion of the side edges of the lid.

[0013] In another embodiment of the present invention, the upper surfaces of the support elements are shaped such that the drawer can be seated thereon. The drawer is seated on the support elements without a connection element and can be easily mounted/dismounted when desired.

[0014] By means of the present invention, the toothed rack and the pinion pair, which is one of the biggest factors that adversely affect the drawer volume, is placed in the dead volume of the cooling device and the usable volume is provided to be increased. Moreover, the aesthetic appearance of the cooling device is improved.

[0015] The cooling device realized in order to attain the aim of the present invention is illustrated in the attached figures, where:

Figure 1 - is the schematic view of a cooling device.
Figure 2 - is the sideways view of the drawers and the body.
Figure 3 - is the perspective view of the drawers and the body.
Figure 4 - is the perspective view of the drawers.
Figure 5 - is the rear perspective view of the lid.

[0016] The elements illustrated in the figures are numbered as follows:

1. Cooling device
2. Body
3. Side wall
4. Compartment
5. Mullion
6. Drawer
7. Lid
8. Pinion
9. Shaft
10. Toothed rack
11. Carrier
12. Movement mechanism
13. First arm
14. Second arm
15. Third arm
16. Housing
17. Support element

[0017] The cooling device (1) comprises a body (2) having two opposite side walls (3), at least two compartments (4) disposed in the body (2) and wherein the items to be cooled are placed, at least one mullion (5) that extends between the two side walls (3) and divides the compartments (4) from each other, at least one drawer (6) placed into the compartment (4) that remains above the mullion (5), at least one lid (7) that provides the drawer (6) to be pulled outside the body (2) and provides access therein, at least two concentric pinions (8) oppositely fixed to the front side of the side walls (3) rotatably, at least one shaft (9) that provides the pinions (8) to rotate around themselves simultaneously by connecting pinions (8) to each other, and at least two toothed racks (10) disposed on the two opposite sides of the base of the drawer (6) and provide the drawer (6) to move on the pinions (8).

[0018] When the drawer (6) is in the closed position, the teeth of the toothed rack (10) and the teeth of the pinion (8) are locked with each other. When the drawer (6) is desired to be reached, the lid (7) is moved and while the teeth on the toothed rack (10) connected to the lid (7) provide the pinion (8) to make circular motion by pushing the teeth of the pinion (8), the toothed rack (10) makes linear motion and provides the lid (7) to move backward and forward. The shaft (9) provides the pinions (8) to rotate at the same time and amount, and thus provides the side edges of the drawer (6) to move together.

[0019] In the cooling device (1) of the present invention, the pinions (8) and the shaft (9) are positioned at the rear side of the mullion (5) so as not to be seen by the user from across. By means of the pinions (8) being under the level of the drawer (6), the shaft (9) is placed between the pinions (8) so as not to prevent the movement of the drawer (6). During the movement of the drawer (6), the pinions (8) and the shaft (9) rotate only around themselves. By means of the placement of the pinion (8) - shaft (9) group behind the mullion (5) which is considered dead volume, the volume of the compartment (4) is effectively used. Moreover, since the rotating components are not seen from outside, the cooling device (1) has a more aesthetic external appearance.

[0020] In an embodiment of the present invention, the pinions (8) are oppositely placed into the gaps formed at the rear corners of the mullion (5) and the shaft (9) connects the pinions (8) to each other such that almost the entire shaft (9) passes through the mullion (5). Thus, the volume occupied by the pinions (8) and the shaft (9) does not extend out of the volume occupied by the mullion (5) and the inner volume of the compartment (4) is used in the most effective way.

[0021] In another embodiment of the present invention, the cooling device (1) comprises at least two channel shaped carriers (11) fastened oppositely to the side walls (3) so as to face each other and at least two movement mechanisms (12) having a first arm (13) disposed into the carrier (11), a second arm (14) fixed to the drawer (6) and a third arm (15) which provides the drawer (6) to be taken outside in steps by sliding on the first arm (13) and the second arm (14). The carrier (11) provides the drawer (6) to move in a single direction by preventing the movement of the arm (15) in the horizontal direction. In this embodiment, the first arm (13) is fixed into the carrier (11) on the side wall (3) and the second arm (14) is fixed on the drawer (6). The third arm (15) is connected to the first arm (13) from one end and to the second arm (14) from the other end. Thus the door is opened in steps and ease of use is provided. Moreover, the sliding movement during the opening of the drawer (6) is provided to be performed in a more controlled manner.

[0022] In another embodiment of the present invention, the cooling device (1) comprises at least two housings (16) disposed on the toothed rack (10) and whereinto the second arm (14) is placed. The second arm (14) is placed into the housing (16) which has an opening with the same size as the cross-sectional area of the second arm (14) and fixed into the housing (16) from the open surface of the housing (16) by means of the connection elements.

[0023] In an embodiment of the present invention, the cooling device (1) comprises at least two support elements (17) which group the housing (16) and the toothed rack (10) and provide them to be mounted to the rear surface of the lid (7). The support elements (17) are oppositely mounted to the sides of the lower edge of the lid (7), one on each side. When the support element (17) is mounted to the lid (7), the toothed rack (10) and the housing (16) extend backwards from the lid (7) vertically to the lid (7). In this embodiment, since the toothed rack (10) and the housing (16) are connected to the lid (7) with a single connection, the total number of the connections in the drawer (6) is decreased and the drawer (6) is provided to be strengthened.

[0024] In another embodiment of the present invention, the drawer (6) is detachably seated on the support elements (17). When seated on the support elements (17),

the drawer (6) can be taken outside the body (2) together with the lid (7) and the items to be stored can be placed therein. Since the drawer (6) being placed on the support elements (17) without any connection element, the drawer (6) can be easily mounted/dismounted. In a variation of this embodiment, the drawers (6) are taken outside the body (2) and thus allow the compartment (4) wherein they are disposed to be used as a larger, single compartment (4).

[0025] By means of the present invention, the compartments (4) of the cooling device (1) can be used in a more effective and flexible manner, and the aesthetic appearance of the cooling device (1) is improved.

[0026] It is to be understood that the present invention is not limited by the embodiments disclosed above and a person skilled in the art can easily introduce different embodiments. These should be considered within the scope of the protection postulated by the claims of the present invention.

Claims

1. A cooling device (1) **comprising** a body (2) having two opposite side walls (3), at least two compartments (4) disposed in the body (2) and wherein the items to be cooled are placed, at least one mullion (5) that extends between the two side walls (3) and divides the compartments (4) from each other, at least one drawer (6) placed into the compartment (4) that remains above the mullion (5), at least one lid (7) that provides the drawer (6) to be pulled outside the body (2) and provides access therein, at least two concentric pinions (8) oppositely fixed to the front side of the side walls (3) rotatably, at least one shaft (9) that provides the pinions (8) to rotate around themselves simultaneously by connecting the pinions (8) to each other, and at least two toothed racks (10) disposed on the two opposite sides of the base of the drawer (6) and provide the drawer (6) to move on the pinions (8), **characterized by** the pinions (8) and the shaft (9) positioned at the rear side of the mullion (5) so as not to be seen by the user from across.

2. A cooling device (1) as in Claim 1, **characterized by** the pinions (8) oppositely placed into the gaps formed at the rear corners of the mullion (5) and the shaft (9) that connects the pinions (8) to each other such that almost the entire shaft (9) passes through the mullion (5).

3. A cooling device (1) as in Claim 1 or 2, **characterized by** at least two channel shaped carriers (11) fastened oppositely to the side walls (3) so as to face each other and at least two movement mechanisms (12) having a first arm (13) disposed into the carrier (11), a second arm (14) fixed to the drawer (6) and a third arm (15) which provides the drawer (6) to be taken outside in steps by sliding on the first arm (13) and the second arm (14).

4. A cooling device (1) as in Claim 3, **characterized by** at least two housings (16) disposed on the toothed rack (10) and whereinto the second arm (14) is placed.

5. A cooling device (1) as in Claim 4, **characterized by** at least two support elements (17) which group the housing (16) and the toothed rack (10) and provide them to be mounted to the rear surface of the lid (7).

6. A cooling device (1) as in Claim 5, **characterized by** the drawer (6) detachably seated on the support elements (17).

Patentansprüche

1. Ein Kühlgerät (1) **bestehend aus** einem Körper (2) mit zwei gegenüberstehenden Seitenwände (3), mindestens zweiKabinen (4) angeordnet im Körper (2) und wobei die Gegenstände für Abkühlen hingelegt werden, mindestens einem Mittelpfosten (5), der sich zwischen zwei Seitenwände (3) erstreckt und die Kabinen (4) voneinander trennt, mindestens einer Schublade (6) hingelegt in die Kabine (4), die über dem Mittelpfosten (5) bleibt, mindestens einem Deckel (7), der sicherstellt, daß die Schublade (6) aus dem Körper (2) herausgezogen wird und man dorthin erreichen kann, mindestens zwei koaxiale Ritzel (8) gegeneinander fixiert zur Vorderseite der Seitenwände (3) rotierbar, mindestens einer Welle (9), die sicherstellt, daß die Ritzel (8) gleichzeitig um sich selbst rotieren durch Verbindung der Ritzel (8) miteinander, und mindestens zweiZahnstangen (10) angeordnet auf zwei gegenüberstehenden Seiten der Basis der Schublade (6) und sicherstellt, daß sich die Schublade (6) auf den Ritzeln (8) bewegt, **gekennzeichnet durch** die Ritzel (8) und Welle (9) aufgestellt an der Hinterseite des Mittelpfostens (5) sodaß sie vom Benutzer gegenüber nicht gesehen werden können.

2. Ein Kühlgerät (1) nach Anspruch 1, **gekennzeichnet durch** Ritzel (8), die gegeneinander hingelegt sind in die Lücken, die an Hinterecken des Mittelpfostens (5) und der Welle (9) gebildet sind, die die Ritzel (8) miteinander verbindet, sodaß beinahe die gesamte Welle (9) durch den Mittelpfosten (5) durchgeht.

3. Ein Kühlgerät (1) nach Anspruch 1 oder 2, **gekennzeichnet durch** mindestens zwei rinnenförmige Trägern (11) befestigt gegenseitig zur Seitenwänden (3) sodaß sie gegeneinander stehen und mindestens

zwei Bewegungsmechanismen (12) mit einem ersten Arm (13) angeordnet in den Träger (11), einem zweiten Arm (14) fixiert zur Schublade (6) und einem dritten Arm (15), der ermöglicht, daß die Schublade (6) herausgenommen wird in Schritten durch Schieben auf dem ersten Arm (13) und zweiten Arm (14).

4. Ein Kühlgerät (1) nach Anspruch 3, **gekennzeichnet durch** mindestens zwei Gehäusen (16) angeordnet auf der Zahnstange (10) und wohin der zweite Arm (14) hingelegt wird.

5. Ein Kühlgerät (1) nach Anspruch 4, **gekennzeichnet durch** mindestens zwei Unterstützungskomponente (17), die das Gehäuse (16) und die Zahnstange (10) unterteilen und sicherstellen, daß sie zur hinteren Oberseite des Deckels (7) montiert werden.

6. Ein Kühlgerät (1) nach Anspruch 5, **gekennzeichnet durch** die Schublade (6), die abtrennbar auf die Unterstützungskomponente (17) hingesetzt werden.

Revendications

1. Dispositif de refroidissement (1) **comprenant** un corps (2) ayant deux parois latérales opposées (3), au moins deux compartiments (4) disposés le corps (2) et dans lequel les articles à refroidir sont placés, au moins un meneau (5) qui s'étend entre les deux parois latérales (3) et divise les compartiments (4) l'un de l'autre, au moins un tiroir (6) placé dans le compartiment (4) qui reste au-dessus du meneau (5), au moins un couvercle (7) qui fournit le tiroir (6) à tirer à l'extérieur du corps (2) et fournit y accéder, au moins deux pignons concentriques (8) fixés de manière opposée au côté avant des parois latérales (3) de façon rotatif, au moins un arbre (9) qui fournit les pignons (8) pour tourner autour d'eux-mêmes simultanément en connectant les pignons (8) l'un à l'autre et au moins deux crémaillères (10) disposées sur les deux côtés opposés de la base du tiroir (6) et fournit le tiroir (6) pour se déplacer sur les pignons (8), **caractérisé par** les pignons (8) et l'arbre (9) positionnés à l'arrière du meneau (5) afin de ne pas être vu par l'utilisateur de l'autre côté.

2. Dispositif de refroidissement (1) selon la revendication 1, **caractérisé par** les pignons (8) placés de manière opposée dans les espaces formés aux coins arrière du meneau (5) et l'arbre (9) qui relie les pignons (8) l'un à l'autre de sorte que presque tout l'arbre (9) traverse le meneau (5).

3. Dispositif de refroidissement (1) selon la revendication 1 ou 2, **caractérisé par** au moins deux supports en forme de canal (11) fixés de manière opposée aux parois latérales (3) de manière à se faire face et au moins deux mécanismes de déplacement (12) ayant un premier bras (13) disposé dans le support (11), un second bras (14) fixé au tiroir (6) et un troisième bras (15) qui fournit le tiroir (6) pour être retiré à l'extérieur par étapes en glissant sur le premier bras (13) et le second bras (14).

4. Dispositif de refroidissement (1) selon la revendication 3, **caractérisé par** au moins deux logements (16) disposés sur la crémaillère (10) et dans lesquels le second bras (14) est placé.

5. Dispositif de refroidissement (1) selon la revendication 4, **caractérisé par** au moins deux éléments de support (17) qui groupent le boîtier (16) et la crémaillère (10) et la monte sur la surface arrière du couvercle (7).

6. Dispositif de refroidissement (1) selon la revendication 5, **caractérisé par** le tiroir (6) étant placé de manière amovible sur les éléments de support (17).

Figure 1

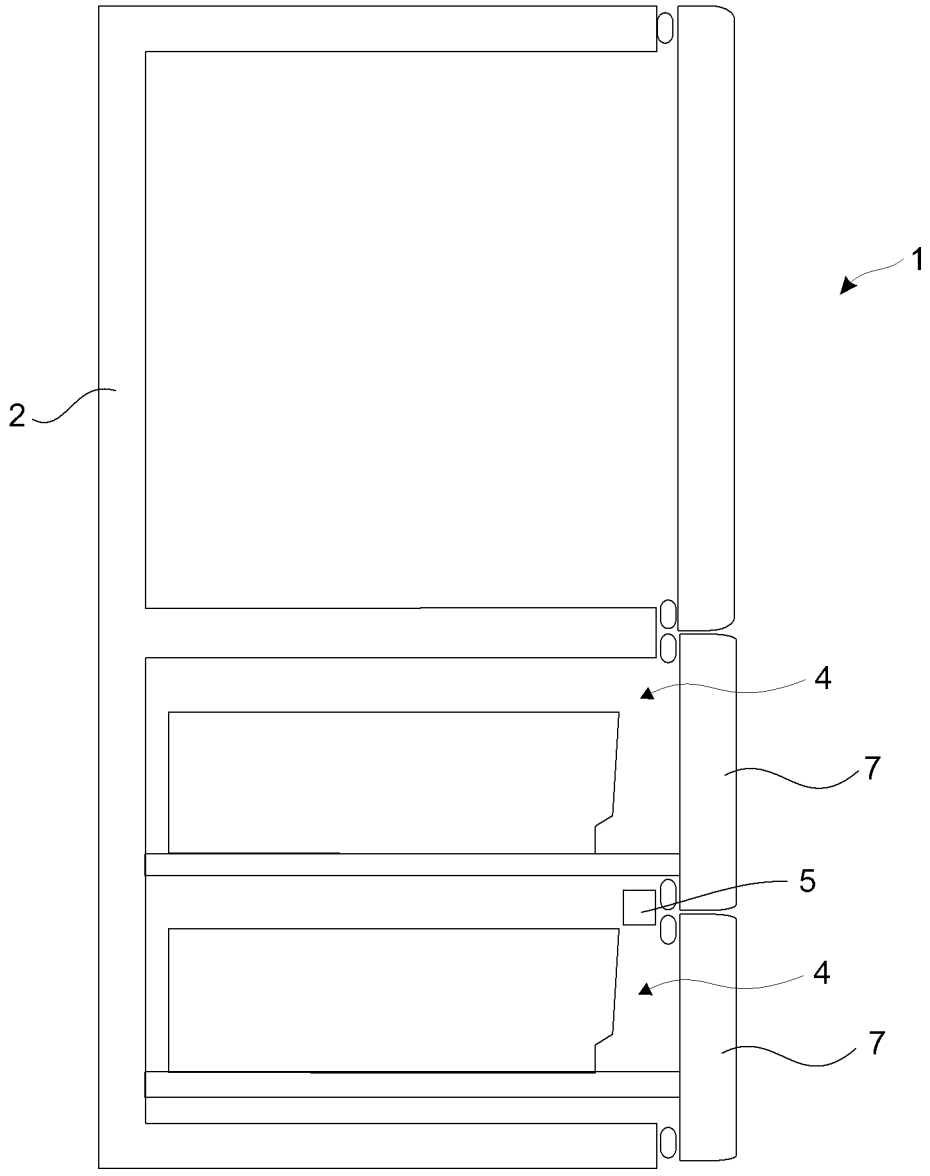


Figure 2

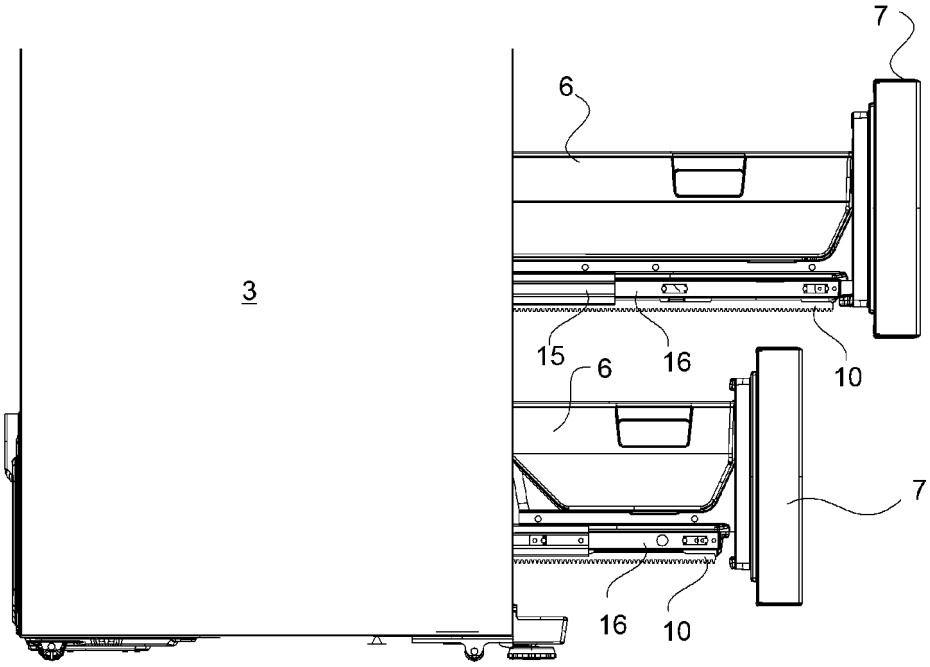


Figure 3

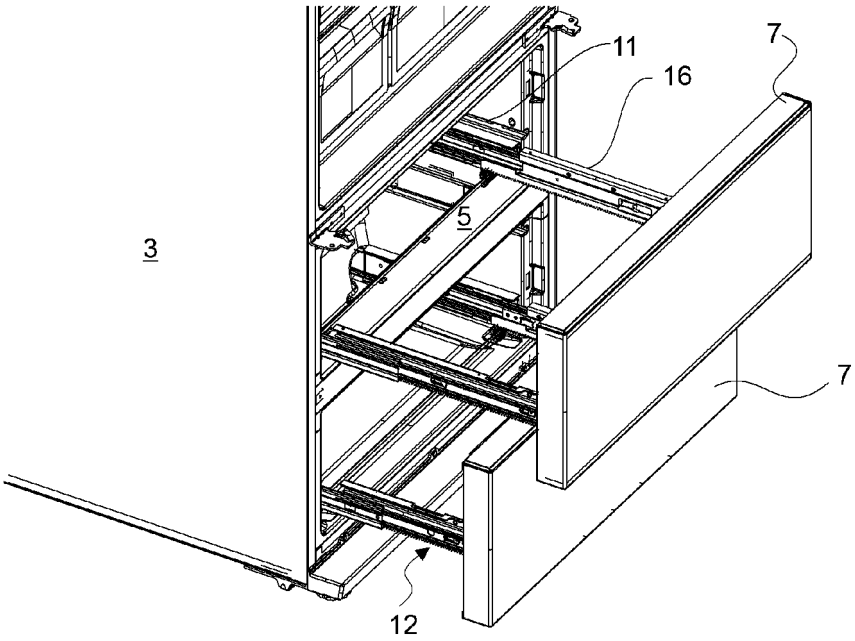


Figure 4

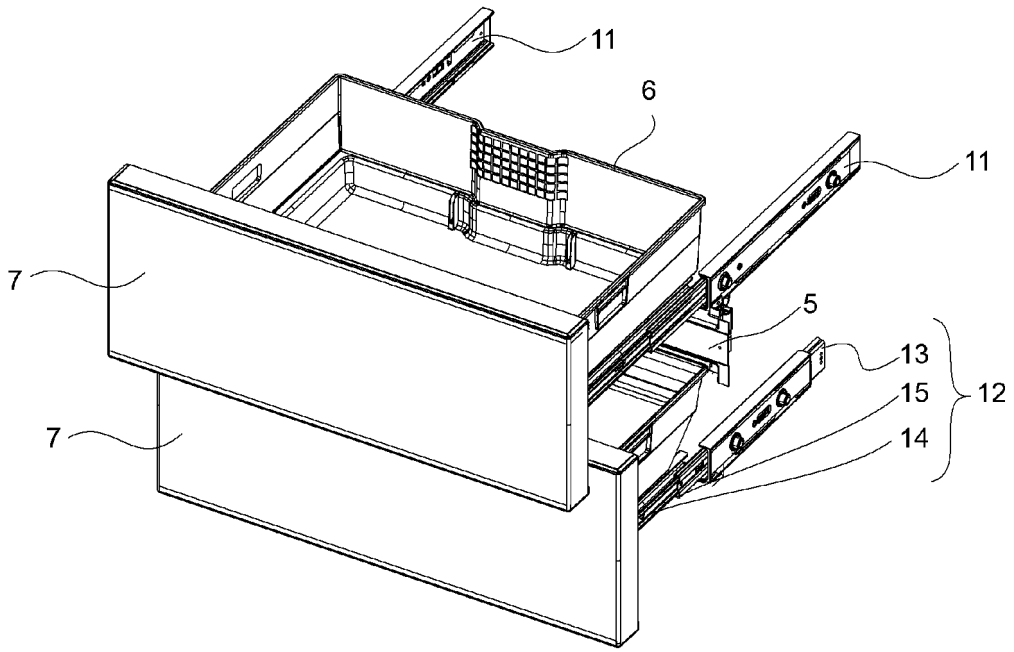
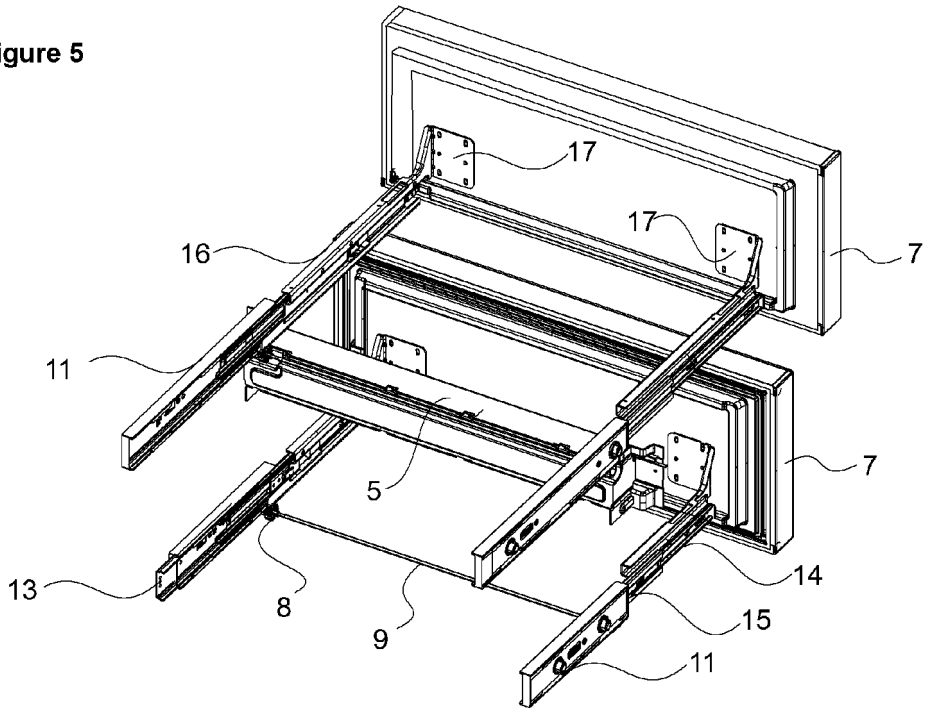


Figure 5



REFERENCES CITED IN THE DESCRIPTION

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