

(19)



(11)

EP 2 758 732 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention of the grant of the patent:
12.06.2019 Bulletin 2019/24

(51) Int Cl.:
F25D 23/06 (2006.01) **F25D 25/02** (2006.01)
A47B 57/30 (2006.01) **F25D 25/04** (2006.01)

(21) Application number: **12766062.9**

(86) International application number:
PCT/EP2012/068671

(22) Date of filing: **21.09.2012**

(87) International publication number:
WO 2013/041686 (28.03.2013 Gazette 2013/13)

(54) A COOLING DEVICE WHEREIN SHELF HEIGHT CAN BE CHANGED

KÜHLVORRICHTUNG MIT ÄNDERBARER REGALHÖHE

DISPOSITIF DE REFROIDISSEMENT DANS LEQUEL LA HAUTEUR DES CLAYETTES PEUT ÊTRE RÉGLÉE

(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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(30) Priority: **21.09.2011 TR 201109285**

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WO-A1-2012/071328 **DE-A1-102008 016 861**
DE-U1-202007 013 356 **US-A- 3 316 044**
US-A- 5 913 584

(43) Date of publication of application:
30.07.2014 Bulletin 2014/31

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• **DATABASE WPI Week 200952 Thomson Scientific, London, GB; AN 2009-M29521 XP002695787, -& KR 2009 0007269 U (SAMSUNG ELECTRONICS CO LTD) 20 July 2009 (2009-07-20)**
• **DATABASE WPI Week 201156 Thomson Scientific, London, GB; AN 2011-K26051 XP002695788, -& CN 201 903 253 U (GUANGDONG GALANZ ENTERPRISE GROUP CO LTD) 20 July 2011 (2011-07-20)**

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Description

[0001] The present invention relates to a cooling device according to the preamble of claim 1, wherein the height of the shelf can be changed. Such a cooling device is known from KR 2009 0007269 U.

[0002] In cooling devices such as refrigerators and deep freezers the foodstuffs and various containers are placed on the shelves. Depending on the needs of the user, the distance between the two shelves is required to be adjusted, in other words the height of the shelf is required to be changed in the body.

[0003] In some cooling devices, channels or rails that extend parallel to each other are disposed on the two opposite side walls of the body so that the height of the shelf can be changed. The user changes the height of the shelf by taking it out from the channels at one level and placing at another pair of channels at the desired level. However, for this operation the user has to first pull the shelf towards the outside of the body and push back towards the body rear wall after placing it in the channel pair at the desired height level. In order to perform this operation safely, the objects on the shelf has to be at least partially taken out and placed on the shelf again after the operation is completed.

[0004] For solving the said problem, shelf mechanisms are used in cooling devices that allow the height of the shelf to be changed without entirely taking out of the body by means of different channel structures on the side wall. In these mechanisms, the shelf is fastened to the side wall by means of the pins disposed at the sides thereof and the height of the shelf is adjusted with the movement of the pin inside the channel. Since the side wall is a large component, it is costly and hard to process it. Moreover, from time to time it can be troubling to insert the pins at the sides of the shelf into the channels on the side wall. Any damage that may occur on the pin causes the whole shelf to be replaced.

[0005] In the state of the art international patent application no. WO03095912, a cooling device is described, comprising a shelf which can move horizontally or vertically without having to remove from inside the body due to the channel structure on the side walls. In this embodiment, the pins at the sides of the shelf are seated into the channel and provide the movement of the shelf.

[0006] EP 1 563 762 A1 discloses an easy height adjustment device for refrigerator shelves, wherein there are guides provided at the inner walls of the refrigerator, and wherein in these guides, a shelf coupled to a retainer can be slid. The shelf is coupled to the retainer in such a manner as to its height to be adjustable.

[0007] DE 10 2008 016 861 A1 discloses a cooling device wherein different modules might be used to attach a shelf in the inner room thereof. This arrangement allows for positioning a support for items to be cooled at two different vertical positions.

[0008] DE 20 2007 013 356 U1 relates to a device for vertically changing the position of a support in a cooling

device where the device includes a rack and pinion mechanism.

[0009] US 5 913 584 A equally discloses a vertically adjustable refrigerator shelf.

[0010] CN201 903 253 U relates to a liftable rack of a refrigerator as well.

[0011] WO 2005/003660 A1 discloses a movable shelf for a refrigerator door, wherein the shelf comprises an internal panel against which are removably affixed shelves provided with a rear wall. The movable shelf comprises a support having a mounting portion disposed between the internal panel and one of the shelves and which are slidingly fitted along the rear wall of that shelf. A lower portion is projecting downwardly from a shelf and carries a tray. The support is incorporating an upper portion which is rotatably supporting a knob which is operatively coupled to the tray and which is displaced between a first position, in which it maintains the tray in the lower position, and a second position, in which it conducts the tray to the elevated position.

[0012] The aim of the present invention is the realization of a cooling device comprising a shelf, the height of which is provided to be changed without being removed from the inside of the body and which can be easily mounted to the body.

[0013] In the cooling device realized in order to attain the aim of the present invention, explicated in the first claim and the respective claims dependant thereof, an adaptor disposed on the side wall and providing the shelf to be adjusted and a retainer movably mounted onto the adaptor are provided. A shelf support providing the shelf to be supported is disposed on one surface of the retainer, and a pin enabling the shelf to move in the channel located on the adaptor is disposed on the other surface. The shelf support is shaped so that the shelf can be slid and inserted therein. By means of the retainer, the shelf is more quickly and easily fastened to the body and the shelf is provided to move more steadily.

[0014] In the present invention, the cooling device further comprises one protrusion on each of the opposite side walls of the adaptor and one slide for each protrusion that strengthens the connection between the retainer and the adaptor by surrounding the protrusion during the mounting of the retainer to the adaptor. By means of the slide and the protrusion, the connection between the retainer and the adaptor is strengthened without preventing the retainer from making sliding movement on the adaptor.

[0015] Furthermore, at least one aligning means is disposed below the protrusion and an opening is arranged above the rail, that is formed so that the aligning means can pass therethrough. The aligning means and the protrusion face the same direction. While the retainer is being mounted to the adaptor, the aligning means and the opening must be aligned. At this time, the pin is aligned with the channel. At this position, when the retainer is placed onto the adaptor and slightly pushed upwards, the slides are fit over the protrusions and thus the retainer

is fastened to the adaptor. Thus, no additional change is required for seating the pin into the channel.

[0016] In an embodiment of the present invention, the cooling device comprises at least two guides arranged on the adaptor and extending parallel to each other and at least two extensions arranged on the shelf, that are seated into the guides to move inside the guides. Thus, the shelf is provided to move only in the vertical direction and the movement is provided to be more easily controlled. Moreover, the shelf is prevented from rotating and being overturned.

[0017] In an embodiment of the present invention, a heart shaped mechanism is disposed on the adaptor. In this embodiment, the pin is disposed on a connection member that is mounted onto the retainer so as to rotate around itself. While the pin moves inside the channels that form the heart mechanism, the connection member rotates and provides the shelf to move only in the vertical direction by absorbing the movement in the horizontal direction. The connection member is preferably disc-shaped.

[0018] In this embodiment the heart shaped mechanism comprises two channels that form a curved path wherein the pin moves by being connected to each other from two ends, at least two housings that are arranged on the island-shaped wall located at the inner portions of the channels and that are disposed in the almost same vertical direction and at least two guiding members that provide the pin to move in the proper direction during the movement of the pin between the housings. In the preferred version of this embodiment, three housings are disposed and the height of the shelf can be changed between three positions.

[0019] In an embodiment of the present invention, at least one adaptor is oppositely disposed on each of the side walls and one retainer is disposed on each of the adaptors. In the preferred version of this embodiment, two adaptors and two retainers are disposed on each of the side wall.

[0020] By means of the present invention, in the cooling devices wherein the height of the shelf can be changed, the shelf is provided to be easily mounted to/dismounted from the body.

[0021] 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 perspective view of a cooling device.

Figure 2 - is the partial view of the cooling device of the present invention.

Figure 3 - is the exploded view of the adaptor, the retainer and the connection member.

Figure 4 - is the front view of the adaptor.

Figure 5 - is the rear view of the retainer.

Figure 6 - is the top view of the adaptor and the retainer.

[0022] The elements illustrated in the figures are num-

bered as follows:

- | | | |
|----|------------------|-------------------|
| | 1. | Cooling device |
| | 2. | Body |
| 5 | 3. | Side wall |
| | 4. | Shelf |
| | 5. | Adaptor |
| | 6. , 106. | Channel |
| | 7. | Retainer |
| 10 | 8. | Shelf support |
| | 9. | Pin |
| | 10. | Heart mechanism |
| | 11. | Connection member |
| | 12. , 112., 212. | Housing |
| 15 | 13. , 113., 213. | Guiding member |
| | 14. | Guide |
| | 15. | Extension |
| | 16. | Protrusion |
| | 17. | Slide |
| 20 | 18. | Aligning means |
| | 19. | Opening |

[0023] The cooling device (1) comprises a body (2) having two opposite side walls (3), at least one shelf (4) whereon the items are placed and at least one adaptor (5) that has at least one channel (6), that is detachably mounted onto the side wall (3) and that enables the height of the shelf (4) to be adjusted. By means of the adaptor (5), the shelf (4) is enabled to move inside the body (2) (Figure 1, Figure 2).

[0024] The cooling device (1) of the present invention furthermore comprises at least one retainer (7) that is mounted onto the adaptor (5) so as to move in the vertical direction and that has a shelf support (8) disposed on the face thereof facing the interior volume of the body (2), wherein one edge of the shelf (4) is placed with a sliding movement (Figure 2, Figure 3, Figure 5).

[0025] The adaptor (5) is mounted onto the side wall (3) of the cooling device (1), the retainer (7) onto the adaptor (5) and the shelf (4) onto the shelf support (8) located on the portion of the retainer (7) facing the body (2). Thus, a modular structure is obtained and ease of use is provided. Since the components of the mechanism providing the adjustment of the height of the shelf (4) are disposed on the adaptor (5) and the retainer (7), the shelf (4) is in the form of an almost flat plate. Since no movable part is present on the shelf (4) placed to the shelf support (8), the shelf (4) is easily mounted to/dismounted from the body (2).

[0026] In the present invention, the cooling device (1) comprises a pin (9) that is disposed on the face of the retainer (7) facing the side wall (3) and that is placed into the channel (6), thus providing the shelf (4) to move in the vertical direction. The pin (9) moves inside the channel (6) located on the adaptor (5) and supports the shelf (4), thus enabling the movement of the shelf (4) in the body (2).

[0027] In the present invention, the cooling device (1)

comprises one protrusion (16) disposed on each of the opposite lateral faces of the adaptor (5) and one slide (17) wherein the protrusion (16) is seated, that is disposed on each of the portions of the retainer (7) surrounding the lateral face of the adaptor (5), that provides the retainer (7) to be movably fastened onto the adaptor (5). The slide (17) surrounds the protrusion (16), preventing the retainer (7) from being freed from the adaptor (5). Thus, an additional security measure is obtained, preventing the shelf (4) from rotating and overturning when an unbalanced load is placed on the shelf (4). At this time, the retainer (7) is prevented from sliding from and leaving the adaptor (5) since the pin (9) is borne in the channel (6). By means of the slide (17) - protrusion (16) pair, the retainer (7) is provided to be safely mounted onto the adaptor (5) in a manner not limiting the movement of the retainer (7) (Figure 6).

[0028] In the present invention the cooling device (1) comprises at least one aligning means (18) placed below the protrusion (16) so as to be spaced from the protrusion (16) and an opening (19) that is formed at the portion of the slide (17) coinciding with the aligning means (18) and that enables the retainer (7) to be mounted to the adaptor (5) so that the pin (9) enters into the channel (6) from the lowermost point. While the retainer (7) is being mounted to the adaptor (5), the opening (19) and the aligning means (18) are overlapped, and while the aligning means (18) enters into the opening (19), the portion of the slide (17) remaining above the opening (19) is fit over the protrusion (16) with the retainer (7) being pushed upwards. At this time, the retainer (7) is safely mounted to the adaptor (5) since the pin (9) is borne in the channel (6). Thus, the need for opening grooves over the adaptor (5) for inserting the pin (9) into the channel (6) while the retainer (7) is mounted to the adaptor (5), is eliminated (Figure 4).

[0029] In an embodiment of the present invention, the cooling device (1) comprises at least two guides (14) that extend along the adaptor (5) in the vertical direction and at least two extensions (15) that are disposed on the retainer (7), providing the movement of the shelf (4) to be limited to the vertical direction by moving inside the guides (14). Thus, during the adjustment of the height of the shelf (4), the shelf (4) is prevented from moving forwards and backwards, thus from obstructing the movement (Figure 3, Figure 4, Figure 5).

[0030] In another embodiment of the present invention, the cooling device (1) comprises a heart shaped mechanism (10) that is disposed on the adaptor (5), a connection member (11) that is rotatably placed on the face of the retainer (7) facing the side wall (3) and the pin (9) that is disposed on the connection member (11). While the pin (9) moves inside the channels (6, 106) that form the heart mechanism (10), no movement is required in horizontal direction thanks to the rotation of the connection member (11) wherein the pin (9) is located and the height of the shelf (4) is adjusted only by moving in the vertical direction (Figure 3, Figure 4, Figure 5).

[0031] In a version of this embodiment, the heart

shaped mechanism (10) comprises two channels (6, 106) connected to each other from their ends, forming a closed curve wherein the pin (9) moves, at least two housings (12, 112, 212) that are arranged on the channels (6, 106), that are disposed at the almost same vertical direction and at different heights and that provide the shelf (4) to be fixed at the position by the pin (9) being seated therein and at least two guiding members (13, 113) that guide the pin (9) while the pin (9) leaves one housing (12) and passes to the other housing (112). While the height of the shelf (4) is being increased, the pin (9) leaves the housing (12, 212) wherein it is seated and bears against the guiding member (13, 213), and moves inside the channel (6). When aligned with the upper housing (212, 112), the pin (9) leaves the guiding member (13, 213) whereon it moves and hits the outer wall of the channel (6), and is seated into the housing (212, 112). While the height of the shelf (4) is being increased, the pin (9) is seated one by one in each of the housings (112, 212) on the channel (6) wherein it moves. When the height of the shelf (4) is desired to be decreased when the pin (9) is in the uppermost housing (112), the shelf (4) is slightly pushed upwards, thus making the pin (9) hit the guiding member (113) above it and the pin (9) is inserted into the channel (106) which is the continuation of the channel (6) wherein it moves when getting near the uppermost housing (112). The pin (9) continues moving downwards inside the said channel (106) to be seated into the lowermost housing (12), thus providing the height of the shelf (4) to be changed. In this embodiment, there are preferably three housings (12, 112, 212) (Figure 4).

[0032] In an embodiment of the present invention, at least one adaptor (5) is oppositely disposed on each of the side walls (3) and one retainer (7) is disposed on each of the adaptors (5). In a version of this embodiment, two adaptors (5) and two retainers (7) are disposed on each of the side wall (3).

[0033] By means of the present invention, in the cooling devices (1) wherein the height of the shelf (4) can be changed, the shelf (4) is provided to be easily mounted to/dismounted from the body (2).

[0034] It is to be understood that the present invention is not limited to the embodiments disclosed above but only by 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 one shelf (4) whereon the items are placed, at least one adaptor (5) that has at least one channel (6), that is detachably mounted onto the side wall (3) and that enables the height of the shelf (4) to be adjusted, at least one retainer (7) that is mounted onto a respective adaptor (5) in such a manner as to enable the retainer (7) to move in the vertical direction with respect to the re-

spective adaptor (5), by one protrusion (16) being disposed on each of the opposite lateral faces of the adaptor (5) and one slide (17) being provided where-
 in the protrusion (16) is seated, that is disposed on
 each of the portions of the retainer (7) surrounding
 the lateral face of the adaptor (5) and that provides
 the retainer (7) to be movably fastened onto the
 adaptor (5), and wherein the retainer (7) has a shelf
 support (8) disposed on the face thereof facing the
 interior volume of the body (2), wherein one edge of
 the shelf (4) is placed with a sliding movement, and
 said cooling device (1) **characterized by** a pin (9)
 that is disposed on the face of the retainer (7) facing
 the side wall (3) and that is placed into the channel
 (6), thus providing the shelf (4) to move in the vertical
 direction and **further characterized by** at least one
 aligning means (18) placed below the protrusion (16)
 so as to be spaced from the protrusion (16) and an
 opening (19) that is formed at the portion of the slide
 (17) coinciding with the aligning means (18) and that
 enables the retainer (7) to be mounted to the adaptor
 (5) so that the pin (9) enters into the channel (6) from
 the lowermost point.

2. The cooling device (1) as in claim 1, **characterized by** at least two guides (14) that extend along the adaptor (5) in the vertical direction and at least two extensions (15) that are disposed on the retainer (7), providing the movement of the shelf (4) to be limited to the vertical direction by moving inside the guides (14).
3. The cooling device (1) as in the Claims 1 or 2, **characterized by** a heart shaped mechanism (10) that is disposed on the adaptor (5), a connection member (11) that is rotatably placed on the face of the retainer (7) facing the side wall (3) and the pin (9) that is disposed on the connection member (11).
4. The cooling device (1) as in Claim 3, **characterized by** the heart shaped mechanism (10) comprising two channels (6, 106) connected to each other from their ends, forming a closed curve wherein the pin (9) moves, at least two housings (12, 112, 212) that are arranged on the channels (6, 106), that are disposed at the almost same vertical direction and at different heights and that provide the shelf (4) to be fixed at the position by the pin (9) being seated therein and at least two guiding members (13, 113) that guide the pin (9) while the pin (9) leaves one housing (12) and passes to the other housing (112) .

Patentansprüche

1. Ein Kühlgerät (1) **besitzt** einen Körper (2) mit zwei gegenüberliegenden Seitenwänden (3), mindestens einem Regal (4), auf der die Artikel angeordnet sind,

mindestens einen Adapter (5), der mindestens einen Kanal (6), das lösbar an der Seitenwand (3) angeordnet ist und das Einstellen der Höhe des Regalbodens (4) ermöglicht, wobei mindestens ein Halter (7) an jeweils einem Adapter (5) montiert ist, um dem Halter (7) die Möglichkeit zu ergeben, sich in vertikaler Richtung in Bezug auf den jeweiligen Adapter (5) zu bewegen, indem ein Vorsprung (16) an jeder gegenüberliegenden Seitenfläche des Adapters (5) und ein Schieber (17) angebracht ist, wobei der Vorsprung (16) so sitzt, das er an jedem der die Seitenfläche des Adapters (5) umgebende Teil des Halters (7) angeordnet ist und somit dem Halter (7) für die bewegliche Befestigung an dem Adapter (5) bereitstellt, wobei der Halter (7) eine Regalstützte (8) besitzt, die auf dem innenvolumen des Körpers (2) zugewandten Fläche angeordnet ist, wobei die Kante des Regalbodens (4) mit einer Gleitbewegung angeordnet ist und das Kühlgerät (1) durch einen Stift (9) **gekennzeichnet** ist, der auf der dem Seitenwand (3) zugewandten Seite des Halters (7) und in dem Kanal (6) angeordnet ist, wodurch das Regal (4) in der vertikalen Richtung bewegt werden kann. Darüber hinaus ist das Kühlgerät (1) **dadurch gekennzeichnet, dass** mindestens ein Ausrichtungsmittel (18), welches unter dem Vorsprung (16) angeordnet ist, damit dem Vorsprung (16) ein Abstand gewährleistet wird und eine Öffnung (19), die an dem Abschnitt des Schlittens (17) ausgebildet ist, der mit der Ausrichtungseinrichtung (18) zusammenfällt um den Halter (7) an dem Adapter (5) anzubringen, da dass der Stift (9) vom untersten Punkt aus in den Kanal (6) treten kann.

2. Das Kühlgerät (1), wie in Anspruch 1 aufgeführt, **ist dadurch gekennzeichnet, dass** mindestens zwei Führungen (14) sich entlang des Adapters (5) in vertikaler Richtung erstrecken und mindestens zwei Verlängerungen (15), an denen der Halter (7) angeordnet ist, für das Bereitstellen der Bewegung des Regalbodens (4), damit die Bewegung durch innerhalb der Führungen (14) in die vertikale Richtung begrenzt werden kann.
3. Das Kühlgerät (1), wie in Anspruch 1 oder 2 aufgeführt, ist durch einen herzförmigen Mechanismus (10) **gekennzeichnet**, der an dem Adapter (5) angebracht ist, ein drehbares Verbindungselement (11), das auf der Vorderseite des Geräts angeordnet ist und dem Halter (7) der Seitenwand (3) zugewandt ist, und dem Stift (9), der an dem Verbindungselement (11) angebracht ist.
4. Das Kühlgerät (1), wie in Anspruch 3 aufgeführt, **ist dadurch gekennzeichnet, dass** der herzförmige Mechanismus (10) zwei Kanäle (6, 106) besitzt, die an den Enden miteinander verbunden sind und somit eine geschlossene Kurve bilden, wobei sich der Stift

(9) mindestens an zwei Gehäusen (12, 112, 212) bewegt, die an den Kanälen (6, 106) angeordnet sind und nahezu in gleicher vertikaler Richtung und auf unterschiedlichen Höhen angeordnet sind und das Regal (4) somit dazu bringen, an der Position durch die sich darin befindlichen Stift (9) befestigt zu werden und mindestens zwei Führungsglieder (13, 113), die den Stift (9) führen, während der Stift (9) ein Gehäuse (12) verlässt um dann zu dem anderen Gehäuse (112) übergeht.

Revendications

1. Un dispositif de refroidissement (1) **comprenant** un corps (2) ayant deux parois latérales opposées (3), au moins une clayette (4) sur laquelle les articles sont placés, au moins un adaptateur (5) qui a au moins un canal (6), qui est monté de manière amovible sur la paroi latérale (3) et qui permet de régler la hauteur de la clayette (4), au moins un dispositif de retenue (7) qui est monté sur un adaptateur correspondant (5) de manière telle que le dispositif de retenue (7) puisse bouger en direction verticale par rapport à l'adaptateur correspondant (5), par une saillie (16) disposée sur chacune des faces latérales opposées de l'adaptateur (5) et une glissière (17) étant prévue dans laquelle la saillie (16) est située, qui est disposée sur chacune des parties du dispositif de retenue (7) entourant la face latérale de l'adaptateur (5) et qui permet au dispositif de retenue (7) d'être fixé de manière mobile sur l'adaptateur (5), et dans lequel le dispositif de retenue (7) comporte un support de tablette (8) disposé sur sa face tournée vers le volume intérieur du corps (2), dans lequel un bord de la clayette (4) est placé avec un mouvement de glissement, et ledit dispositif de refroidissement (1) **est caractérisé par** une broche (9) qui est disposée sur la face du dispositif de retenue (7) tournée vers la paroi latérale (3) et qui est placée dans le canal (6), permettant ainsi à la clayette (4) de se déplacer dans la direction verticale et **est caractérisé en outre par** au moins un moyen d'alignement (18) placé sous la saillie (16) de manière à être espacé de la saillie (16) et une ouverture (19) qui est formée à la partie de la glissière (17) qui coïncide avec le moyen d'alignement (18) et qui permet le montage du dispositif de retenue (7) à l'adaptateur (5) afin que la broche (9) entre dans le conduit (6) à partir du point le plus bas.
2. Le dispositif de refroidissement (1) selon la déclaration 1, **est caractérisé en ce qu'il** comporte au moins deux guides (14) qui s'étendent le long de l'adaptateur (5) dans la direction verticale et au moins deux extensions (15) qui sont disposées sur le dispositif de retenue (7), le mouvement de la clayette (4) devant être limité en direction verticale

en étant déplacé dans les guides (14).

3. Le dispositif de refroidissement (1) selon les déclarations 1 ou 2, **est caractérisé en ce qu'il** comporte un mécanisme en forme de coeur (10) disposé sur l'adaptateur (5), un élément de liaison (11) qui est placé de manière rotative sur le côté du dispositif de retenue (7) tourné vers la paroi latérale (3) et la broche (9) qui est disposée sur l'élément de liaison (11).
4. Le dispositif de refroidissement (1) selon la déclaration 3, **est caractérisé en ce que** le mécanisme en forme de coeur (10) comprend deux canaux (6, 106) reliés entre eux par leurs extrémités, formant une courbe fermée où la broche (9) se déplace, au moins deux logements (12, 112, 212) qui sont disposés sur les canaux (6, 106), qui sont disposés à peu près dans le même sens vertical et à des hauteurs différentes et qui permettent de fixer la clayette (4) en position par la broche (9) qui y est située et au moins deux guides (13, 113) qui guident la broche (9) pendant que la broche (9) quitte un logement (12) et passe dans l'autre logement (112).

Figure 1

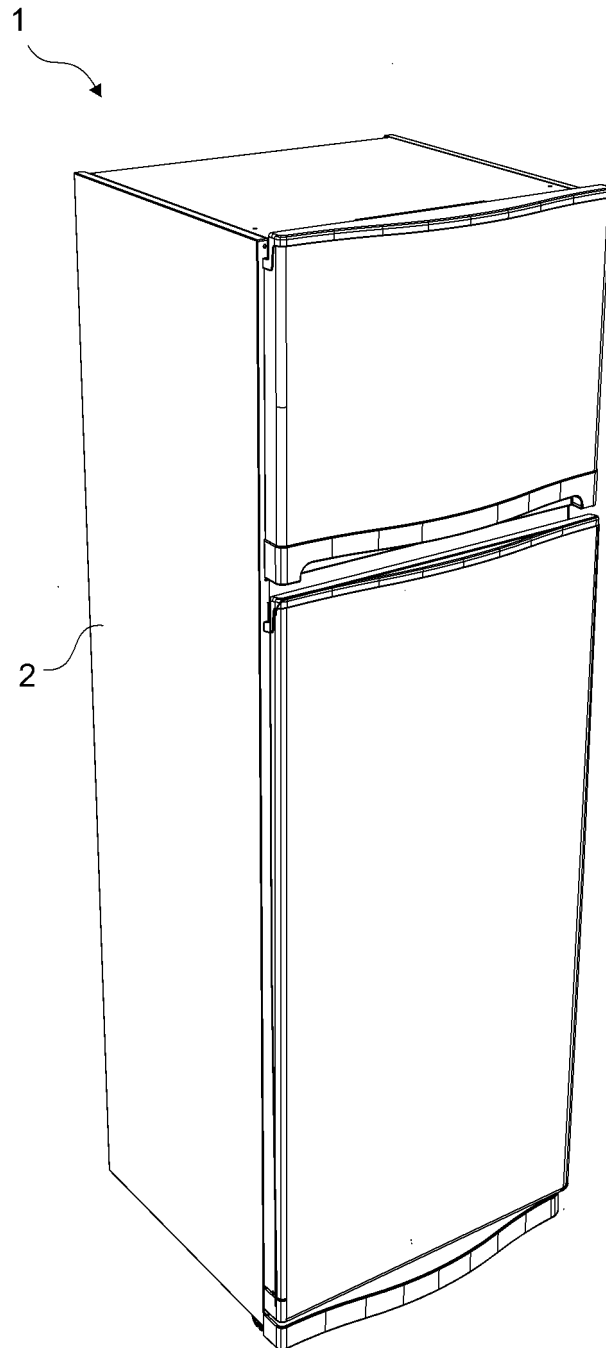


Figure 2

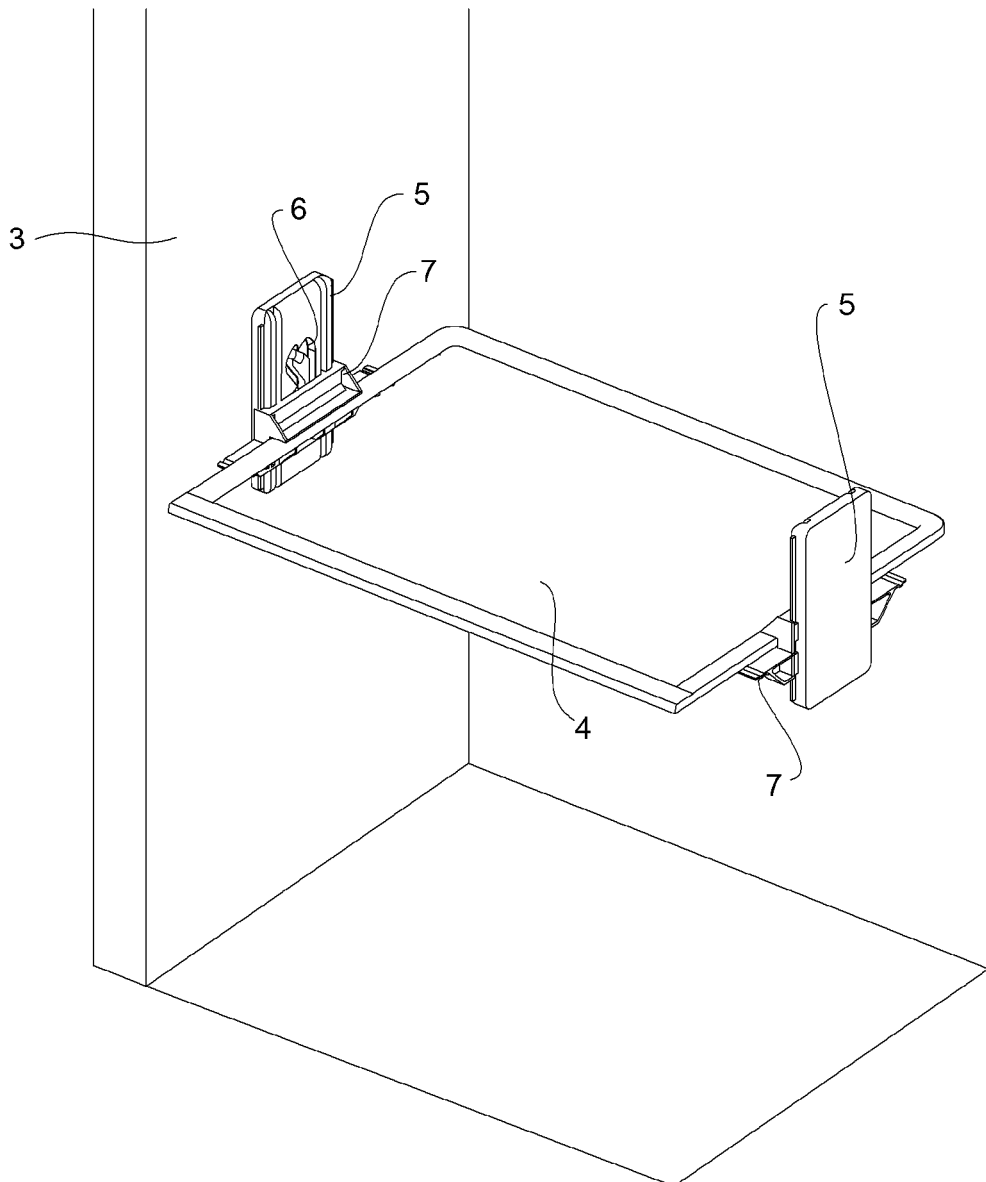


Figure 3

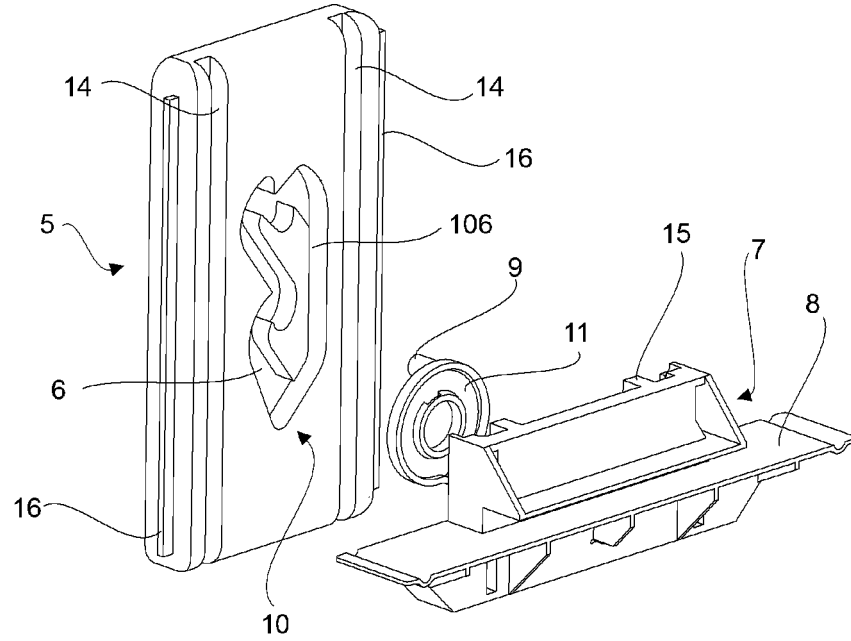


Figure 4

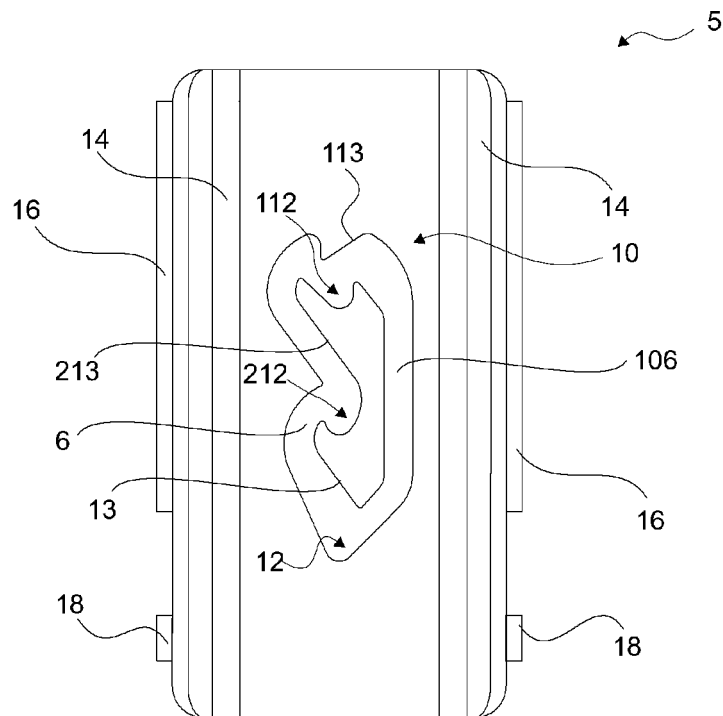


Figure 5

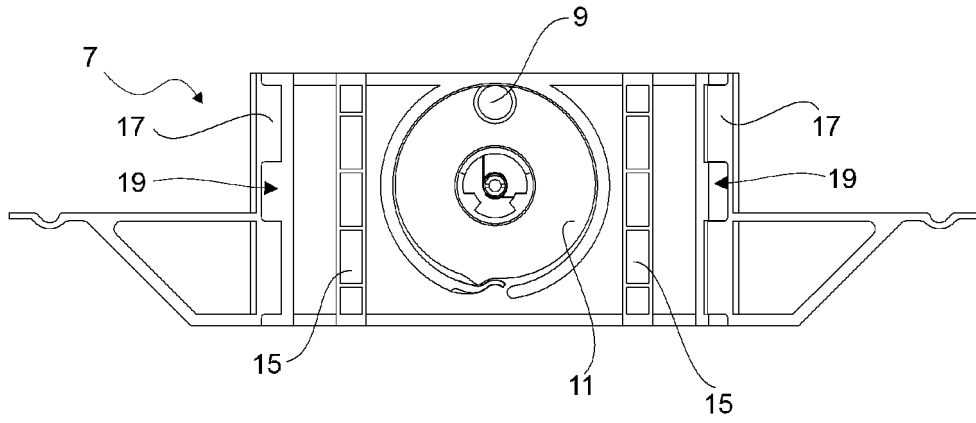
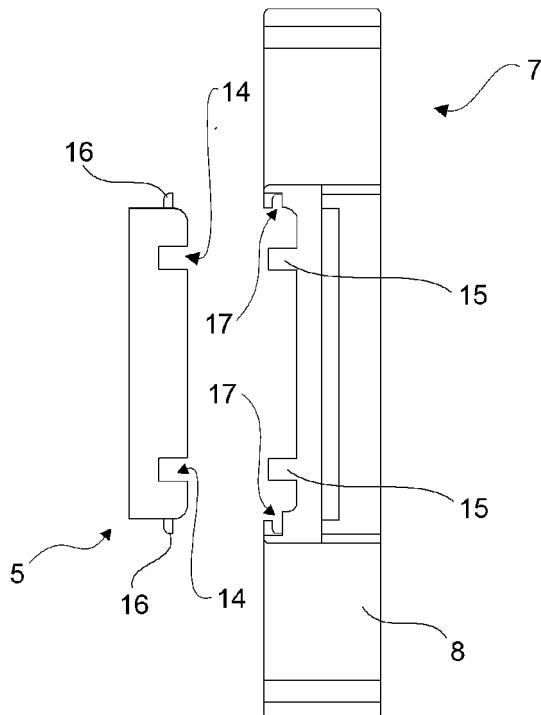


Figure 6



REFERENCES CITED IN THE DESCRIPTION

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