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(54) **A COOLING DEVICE**

KÜHLVORRICHTUNG

DISPOSITIF DE REFRIGERATION

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- **PATENT ABSTRACTS OF JAPAN vol. 2003, no. 12, 5 December 2003 (2003-12-05) -& JP 2003 269853 A (TOSHIBA CORP), 25 September 2003 (2003-09-25)**
- **PATENT ABSTRACTS OF JAPAN vol. 2003, no. 11, 5 November 2003 (2003-11-05) -& JP 2003 185331 A (TOSHIBA CORP), 3 July 2003 (2003-07-03)**
- **PATENT ABSTRACTS OF JAPAN vol. 2003, no. 07, 3 July 2003 (2003-07-03) -& JP 2003 065662 A (HITACHI LTD), 5 March 2003 (2003-03-05)**
- **PATENT ABSTRACTS OF JAPAN vol. 2003, no. 12, 5 December 2003 (2003-12-05) -& JP 2003 302150 A (TOSHIBA CORP), 24 October 2003 (2003-10-24)**

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EP 1 769 202 B1

Description

[0001] This invention relates to a cooling device which comprises an additional door on its door.

[0002] In cooling devices, a door is utilized to enable the user to reach the items loaded. In the current state of the art, a gasket is fastened to the surface of the door that contacts the body of the cooling device so as to surround the entire periphery and by means of mentioned gasket, sealing is achieved by hindering the heat transfer between the internal volume of the cooling device and the external medium where the cooling device is placed, as the door is closed.

[0003] As the door is opened, the internal volume of the cooling device that is colder than the external medium starts to be heated, affecting the operating period of the compressor in relation to the frequency of the opening and closing of the cooling device door and to the amount of time where the door is kept open. For instance, in order to take a beverage bottle, the door is opened to be able to take the said bottle out and thereby, by unnecessarily causing the temperature of the entire internal volume of the cooling device to rise, the operating period of the compressor and accordingly the energy consumption of the cooling device are increased. To solve this problem, several solutions are available in the current state of the art, wherein the user is enabled to reach the interior of the cooling device without the need of opening the cooling device door.

[0004] In the current state of the art, in the United States Patent Document US 5209082, a description is given of a second door mounted to the door of the cooling device, whereby it is achieved to reach a compartment formed in the internal volume of the cooling device from the outside without opening the cooling device door.

[0005] In the current state of the art, in the International Patent Application W09901704, a description is given of a mini door positioned at the door of the cooling compartment, having a structure that enables the foods and beverages to be taken out of the cooling device, when opened entirely.

[0006] In the current state of the art, in the European Patent Application 1329679, a cooling device according to the preambule of claim 1 is disclosed.

[0007] The aim of the present invention is the realization of a cooling device comprising an additional door which enables the items loaded into the cooling device to be taken out of the cooling device without opening the cooling device door.

[0008] The cooling device designed to fulfill the objectives of the present invention is defined in claim 1. The invention will be better understood in view of the following figures:

[0009] Fig.1 - is a schematic view of a cooling device according to the invention when the additional door is closed.

[0010] Fig.2 - is a schematic view of a cooling device according to the invention, when the additional door is open.

[0011] Fig.3 - is a perspective view of a cooling device according to the invention while opening the additional door.

[0012] Fig.4 - is a schematic view of a cooling device, when the additional door is closed; this embodiment does not fall within the scope of the present invention.

[0013] Fig.5 - is a schematic view of a cooling device, when the additional door is open; in this embodiment does not fall within the scope of

[0014] fig.6 - is a perspective view of a cooling device while opening the additional door; this embodiment does not fall within the scope of the present invention.

[0015] Elements shown in figures are numbered as follows

1. Cooling device
2. Body
3. Door
4. Additional door
5. Aperture
6. Sealing element
7. Stopper
8. Cooling device internal volume
9. Shelf
10. Handle
11. Pin
12. Housing
13. Inner compartment shelf

[0016] The cooling device (1), the object of the present invention, comprises a body (2), a cooling device internal volume (8) inside the body (2), incorporating one or more than one inner compartment shelf (13) whereon items particularly foods are placed, a door (3) which enables the user to close the body (2) and to reach the items placed inside the body (2), an aperture (5) on the door (3) which has such a form enabling the user to reach the cooling device internal volume (8) without opening the door (3) and, an additional door (4) closing the aperture (5) as it is closed by being moved around a horizontal or vertical rotation axis (X) which connects the opposite edges of the aperture (5) without coinciding with any edge and when opened, enables the access to the cooling device internal volume (8) through the aperture (5) positioned on the door (3) in such a manner that the heat transfer between the external medium and the cooling device internal volume (8) is minimum.

[0017] The aperture (5) on the door (3), preferably in quadrangular form, is in the form of a frame with a gap in the middle, comprising an upper edge, a lower edge and side edges connecting the upper and the lower edges.

[0018] The cooling device (1) comprises one or more than one pin (11) forming the rotation axis (X) of the additional door (4) and one or more than one housing (12) where mentioned pins (11) fit to. By means of said pins (11) and housings (12), the additional door (4) rotates

about the rotation axis (X).

[0019] The additional door (4) is preferably in quadrangular form and, comprises a handle (10) whereby the user opens and closes it by grasping and, a shelf (9) wherein foods are placed.

[0020] The cooling device (1) also comprises a sealing element (6) whereby sealing between the external medium and the cooling device internal volume (8) is achieved when the additional door (4) is closed. Whereas the sealing element (6) may be positioned on the aperture (5), it may be positioned on the additional door (4) as well. For the sealing element (6), preferably a gasket is utilized.

[0021] The cooling device (1) also comprises a stopper (7) where the sealing element (6) fits to prevent the additional door (4) from going further after it is closed. If the sealing element (6) is positioned on the aperture (5), the stopper (7) is positioned on the additional door (4). Whereas the stopper (7) may be a recess in such a form that the sealing element (6) is not permitted to disengage unless a force is applied to the additional door (4), it may also be manufactured as a projection formed on at least one edge of the additional door (4) where the sealing element (6) fits to and, which projection prevents the additional door (4) from moving further by contacting it as it is closed and preferably is parallel to the rotation axis of the aperture (5). The stoppers (7) in form of a projection, are preferably positioned at the opposite edges of the aperture (5), symmetric to the mid point of the aperture (5) where its horizontal and vertical axes coincide and in addition to that, there are also provided stoppers (7) which are positioned at the opposite edges of the additional door (4), symmetric to the mid point of the additional door (4) where its horizontal and vertical axes coincide and, are to contact the stoppers (7) on the aperture (5). There may be sealing elements (6) located on the stoppers (7) that are positioned on the additional door (4) and / or on the aperture (5). If it is desired to close the additional door (4), the additional door (4) is moved as the user applies a force and, the sealing element (6) on the additional door (4) fits to the stopper (7) at the edges of the aperture (5) when the edges of the aperture (5) and the edges of the additional door (4) attain a position oppositely parallel to each other. In that case, the additional door (4) is closed in such a way that sealing between the cooling device internal volume (8) and the external medium is achieved.

[0022] According to the present invention, the additional door (4) is positioned such that the rotation axis (X) is located approximately in the middle of the opposite edges of the aperture (5). Thereby, the additional door (4) may be opened and closed by rotating 360° about the rotation axis (X) clockwise or counterclockwise; in other words, it may be opened and closed by rotating also at different angles in both directions. When a force sufficient to disengage the sealing element (6) that is fitted to the stopper (7) from the stopper (7) is applied to the additional door (4) in closed position, the additional door (4) starts to be opened on the aperture (5) by rotating about the rotation axis (X) in such a manner that the heat transfer between the external medium and the cooling device internal volume (8) is minimum. As the additional door (4) is brought to an approximate position of 180°, the shelf (9), which is inside the cooling device internal volume (8) in closed position, comes completely out to the ex ternal medium, in that case, the additional door (4) is brought to open position as the sealing element (6) fits to the stopper (7) again. In this situation, the aperture (5) is completely closed by the additional door (4) wherein the heat transfer between the external medium and the cooling device internal volume (8) is hindered and a complete sealing is achieved and, the user is enabled to reach the cooled items on the shelf (9). When a force is again applied onto the additional door (4), the sealing element (6) disengages from the stopper (7) and as the additional door (4) performs a motion of 180°, the shelf (9) in the external medium goes back to the internal volume (8) and the sealing element (6) fits to the stopper (7) to attain the closed position (Figure 1, Figure 2 and Figure 3).

[0023] In the afore-mentioned embodiment, if the user desires to reach the items inside the cooling device internal volume (8) and not the shelf (9) on the additional door (4), the additional door (4) is brought to a position of preferably 90°. In that case, the additional door (4) opens and enables the maximum amount of air transfer on the aperture (5). ' The user can reach the internal volume (8) by putting his / her hand in through the aperture (5) and so can take the items inside the internal volume (8) out of the cooling device (1).

[0024] In another embodiment which is not covered by the present invention, the additional door (4) is positioned such that the rotation axis (X) is closer to one of the edges of the aperture (5). In the mentioned embodiment, the additional door (4) is able to be opened and closed by moving in one direction. Therefore, the additional door (4) is opened only if a force is applied to the edge of the additional door (4) which is the one that is farther to the rotation axis (X). If a force sufficient to disengage the sealing element (6) that is fitted to the stopper (7) from the stopper (7), is applied to the additional door (4) in closed position, the additional door (4) starts a rotary motion about the rotation axis (X). The additional door (4) continues to move until one of its surfaces contacts one of the edges of the aperture (5) and so, the motion is stopped when the contact occurs as mentioned. The user can reach the internal volume (8) by putting his / her hand in through the aperture (5) and can take items inside the internal volume (8) or on the shelf (9) out of the cooling device (1). When a force is again applied to the additional door (4) but in the opposite direction of the force that is applied to open it, the additional door (4) starts to move in the opposite direction of the opening motion. This motion continues until the additional door (4) contacts the stopper (7), resulting in closing of the additional door (4) as sealed wherein the sealing element (6) fits to the stopper (7) while the additional door (4) contacts the stopper

(7) (Figure 4, Figure 5 and Figure 6).

[0025] The inner shelves (13) inside the cooling device internal volume (8) are shaped in the form of the path followed by the edges of the additional door (4), preferably parallel to the mentioned path, in such a manner that the motion of the additional door (4) is not obstructed (Figure 1, Figure 2, Figure 4 and Figure 5).

[0026] The cooling device (1) also comprises a locking mechanism to enable the additional door (4) to be closed and locked. By means of said locking mechanism, the additional door (4) can stay in locked position.

[0027] By means of the additional door (4) comprised by the cooling device (1) which is the object of the present invention, it is achieved to minimize the energy consumption by enabling the items loaded inside the cooling device (1) to be taken out of the cooling device (1) without opening its door (3).

Claims

1. A cooling device (1) comprising

- a body (2),
- a cooling device internal volume (8) inside the body (2), incorporating one or more than one inner compartment shelf (13) whereon items particularly foods are placed,
- a door (3) which enables the user to close the body (2) and to reach the items placed inside the body (2) and,
- an aperture (5) on the door (3) which has such a form enabling the user to reach the cooling device internal volume (8) without opening the door (3),

and an additional door (4) closing the aperture (5) as it is closed by being moved around a horizontal or vertical rotation axis (X) which connects the opposite edges of the aperture (5) without coinciding with any edge and when opened, enables the access to the cooling device internal volume (8) through the aperture (5) positioned on the door (3) in such a manner that the heat transfer between the external medium and the cooling device internal volume (8) is minimum, **characterized in that** the said additional door (4) is positioned such that the rotation axis (X) is located approximately in the middle of the opposite edges of the aperture (5).

2. A cooling device (1) as described in Claim 1, **characterized by** an additional door (4) which may be opened and closed by rotating 360° about the rotation axis (X) clockwise or counterclockwise or at different angles in both directions.

3. A cooling device (1) as described in Claim 1 or 2, **characterized by** an additional door (4) which is brought to open position by rotating about the rotation axis (X) such that air transfer between the cooling device internal volume (8) and the external medium is prevented, wherein a complete sealing is achieved.

4. A cooling device (1) as described in Claims 1 - 3, **characterized by** an additional door (4) which, when rotated 180°, completely closes the aperture (5) in such a manner that air transfer between the cooling device internal volume (8) and the external medium is prevented, achieving a complete sealing and, enables the user to reach the cooled items on the shelf (9).

5. A cooling device (1) as described in Claims 1 - 4, **characterized by** one or more than one pin (11) forming the rotation axis (X) of the additional door (4) and one or more than one housing (12) where mentioned pins (11) fits to.

6. A cooling device (1) as described in Claims 1 - 5, **characterized by** an additional door (4) comprising a shelf (9) where foods are placed in.

7. A cooling device (1) as described in any of the above Claims, **characterized by** a sealing element (6) whereby sealing between the external medium and the cooling device internal volume (8) is achieved when the additional door (4) is closed and, by a stopper (7) where the sealing element (6) fits after the additional door (4) is closed to prevent it from going further.

8. A cooling device (1) as described in Claim 7, **characterized by** a stopper (7) which is formed on at least one of the edges of the aperture (5) which are parallel to the rotation axis (X).

9. A cooling device (1) as described in Claims 7 and 8, **characterized by** a stopper (7) in form of a recess.

10. A cooling device (1) as described in Claims 7 and 8, **characterized by** a stopper (7) in form of a projection.

11. A cooling device (1) as described in Claims 7 - 10, **characterized by** a stopper (7) which is positioned at the opposite edges of the aperture (5), symmetric to the mid point of the aperture (5) where its horizontal and vertical axes coincide.

12. A cooling device (1) as described in Claims 7 and 9 - 11, **characterized by** a stopper (7) which is positioned at the opposite edges of the additional door (4), symmetric to the mid point of the additional door (4) where its horizontal and vertical axes coincide.

13. A cooling device (1) as described in any of the above Claims, **characterized by** an inner shelf (13) inside the cooling device internal volume (8) which is shaped in the form of the path followed by the edges of the additional door (4), in such a manner that the motion of the additional door (4) is not obstructed.

Patentansprüche

1. Kühlvorrichtung (1), umfassend:

- einen Gehäusekörper (2)
- einen Kühlvorrichtungsinnenraum (8) im Inneren des Gehäusekörpers (2), das ein oder mehrere Innenfachregale (13) aufweist, auf denen Gegenstände, insbesondere Lebensmittel, platziert werden
- eine Tür (3), die es dem Benutzer erlaubt, den Gehäusekörper (2) zu schließen und die in dem Gehäusekörper (2) platzierten Gegenstände zu erreichen, und
- eine Öffnung (5) an der Tür (3), deren Form derart ist, dass der Benutzer den Kühlvorrichtungsinnenraum (8) erreichen kann, ohne die Tür (3) zu öffnen,

und eine zusätzliche Tür (4), die die Öffnung (5) schließt, wenn sie geschlossen wird, indem sie um eine horizontale oder vertikale Drehachse (X) bewegt wird, die die gegenüberliegenden Kanten der Öffnung (5) verbindet, ohne auf eine der Kanten zu treffen, und die beim Öffnen den Zugang zum Kühlvorrichtungsinnenraum (8) durch die Öffnung (5) an der Tür (3) derart ermöglicht, dass die Wärmeübertragung zwischen dem Außenmedium und dem Kühlvorrichtungsinnenraum (8) minimal ist, **dadurch gekennzeichnet, dass** die genannte zusätzliche Tür (4) derart positioniert ist, dass die Drehachse (X) in etwa in der Mitte der gegenüberliegenden Kanten der Öffnung (5) angeordnet ist.

2. Kühlvorrichtung (1) nach Anspruch 1, **gekennzeichnet durch** eine zusätzliche Tür (4), die **durch** Drehen um 360° um die Drehachse (X) im Uhrzeigersinn oder gegen den Uhrzeigersinn oder in unterschiedlichen Winkeln in beide Richtungen geöffnet und geschlossen werden kann.

3. Kühlvorrichtung (1) nach Anspruch 1 oder 2, **gekennzeichnet durch** eine zusätzliche Tür (4), die in die offene Position gebracht wird, indem sie um die Drehachse (X) gedreht wird, derart, dass Luftübertragung zwischen dem Kühlvorrichtungsinnenraum (8) und dem externen Medium verhindert wird, wodurch eine vollständige Abdichtung erreicht wird.

4. Kühlvorrichtung (1) nach den Ansprüchen 1 bis 3, **gekennzeichnet durch** eine zusätzliche Tür (4), die, wenn sie um 180° gedreht wird, die Öffnung (5) vollständig schließt, derart, dass eine Luftübertragung zwischen dem Kühlvorrichtungsinnenraum (8) und dem externen Medium verhindert wird, wodurch eine vollständige Abdichtung erreicht wird, und die es dem Benutzer erlaubt, die gekühlten Gegenstände auf dem Regal (9) zu erreichen.

5. Kühlvorrichtung (1) nach den Ansprüchen 1 bis 4, **gekennzeichnet durch** einen oder mehrere Stifte (11), die die Drehachse (X) der zusätzlichen Tür (4) bilden, und ein oder mehrere Gehäuse (12), in die die genannten Stifte (11) eingepasst sind.

6. Kühlvorrichtung (1) nach den Ansprüchen 1 bis 5, **gekennzeichnet durch** eine zusätzliche Tür (4), die ein Regal (9) umfasst, auf dem Lebensmittel platziert werden.

7. Kühlvorrichtung (1) nach einem der vorangehenden Ansprüche, **gekennzeichnet durch** ein Dichtungselement (5), wodurch eine Dichtung zwischen dem externen Medium und dem Kühlvorrichtungsinnenraum (8) erreicht wird, wenn die zusätzliche Tür (4) geschlossen wird, und **durch** einen Anschlag (7), mit dem das Dichtungselement (6) in Passverbindung tritt, wenn die zusätzliche Tür (4) geschlossen wird, um zu verhindern, dass es sich weiter bewegt.

8. Kühlvorrichtung (1) nach Anspruch 7, **gekennzeichnet durch** einen Anschlag (7), der an wenigstens einer der Kanten der Öffnung (5) ausgebildet ist, die parallel zu der Drehungsachse (X) verlaufen.

9. Kühlvorrichtung (1) nach den Ansprüchen 7 und 8, **gekennzeichnet durch** einen Anschlag (7) in Form einer Vertiefung.

10. Kühlvorrichtung (1) nach den Ansprüchen 7 und 8, **gekennzeichnet durch** einen Anschlag (7) in Form eines Vorsprungs.

11. Kühlvorrichtung (1) nach den Ansprüchen 7 bis 10, **gekennzeichnet durch** einen Anschlag (7), der an den gegenüberliegenden Kanten der Öffnung (5) symmetrisch zum Mittelpunkt der Öffnung (5) angeordnet ist, wo deren horizontale und vertikale Achse aufeinander treffen.

12. Kühlvorrichtung (1) nach Anspruch 7 und den Ansprüchen 9 bis 11, **gekennzeichnet durch** einen Anschlag (7), der an den gegenüberliegenden Kanten der zusätzlichen Tür (4) symmetrisch zum Mittelpunkt der zusätzlichen Tür (4) angeordnet ist, wo deren horizontale und vertikale Achse aufeinander treffen.

13. Kühlvorrichtung (1) nach einem der vorangehenden Ansprüche, **gekennzeichnet durch** ein Innenregal (13) im Inneren des Kühlvorrichtungsinnenraums (8), das in Form des Wegs geformt ist, dem die Kanten der zusätzlichen Tür (4) folgen, derart, dass die Bewegung der zusätzlichen Tür (4) nicht behindert wird.

Revendications

1. Un dispositif de refroidissement (1) comprenant

- un corps (2),
- un volume interne de dispositif de refroidissement (8) dans le corps (2), comportant une ou plusieurs étagère(s) de compartiment interne (13) sur laquelle/lesquelles sont placés les objets, les aliments en particulier,
- une porte (3) qui permet à l'utilisateur de fermer le corps (2) et d'atteindre les objets placés dans le corps (2) et
- une ouverture (5) sur la porte (3) qui a une telle forme permettant à l'utilisateur d'atteindre le volume interne de dispositif de refroidissement (8) sans ouvrir la porte (3),

et une porte supplémentaire (4) fermant l'ouverture (5) lorsqu'elle est fermée en étant tournée autour d'un axe de rotation horizontal ou vertical (X) qui relie les bords opposés de l'ouverture (5) sans coïncider avec n'importe quel bord et lorsqu'elle est ouverte, qui permet l'accès dans le volume interne de dispositif de refroidissement (8) à travers l'ouverture (5) positionnée sur la porte (3) de telle manière que le transfert de chaleur entre le milieu extérieur et le volume interne de dispositif de refroidissement (8) est minimale, **caractérisé en ce que** ladite porte supplémentaire (4) est positionnée de telle sorte que l'axe de rotation (X) est situé approximativement au milieu des bords opposés de l'ouverture (5).

2. Un dispositif de refroidissement (1) selon la Revendication 1, **caractérisé par** une porte supplémentaire (4) qui peut être ouvert et fermé en tournant 360° autour de l'axe de rotation (X) dans le sens horaire ou antihoraire ou aux différents angles dans les deux sens.

3. Un dispositif de refroidissement (1) selon la Revendication 1 ou 2, **caractérisé par** une porte supplémentaire (4) qui est mis en position ouverte en étant tourné autour de l'axe de rotation (X) de telle sorte que le transfert d'air entre le volume interne de dispositif de refroidissement (8) et le milieu extérieur est empêché, où une étanchéité compète est réalisée.

4. Un dispositif de refroidissement (1) selon les revendications 1 à 3, **caractérisé par** une porte supplémentaire (4) qui, lorsqu'elle est tourné 180°, ferme complètement l'ouverture (5) de telle manière que le transfert d'air entre le volume interne de dispositif de refroidissement (8) et le milieu extérieur est empêché, réalisant une étanchéité complète et, qui permet à l'utilisateur d'atteindre les objets refroidis sur l'étagère (9).

5. Un dispositif de refroidissement (1) selon les revendications 1 à 4, **caractérisé par** une ou plusieurs goupilles (11) qui forment l'axe de rotation (X) de la porte supplémentaire (4) et un ou plusieurs logement (s) (12) dans lequel/lesquels lesdites goupilles (11) sont placées.

6. Un dispositif de refroidissement (1) selon les revendications 1 à 5, **caractérisé par** une porte supplémentaire (4) comprenant une étagère (9) où les aliments sont placés.

7. Un dispositif de refroidissement (1) selon l'une quelconque des revendications précédentes, **caractérisé par** un élément d'étanchéité (6) par lequel l'étanchéité entre le milieu extérieur et le volume interne de dispositif de refroidissement (8) est réalisé lorsque la porte supplémentaire (4) est fermée et, par une butée (7) sur laquelle l'élément d'étanchéité (6) s'appuie après la porte supplémentaire (4) est fermée afin de l'empêcher d'aller plus loin.

8. Un dispositif de refroidissement (1) selon la Revendication 7, **caractérisé par** une butée (7) qui est formée sur au moins l'un des bords de l'ouverture (5) qui sont parallèles à l'axe de rotation (X).

9. Un dispositif de refroidissement (1) selon les revendications 7 et 8, **caractérisé par** une butée (7) sous forme d'un évidement.

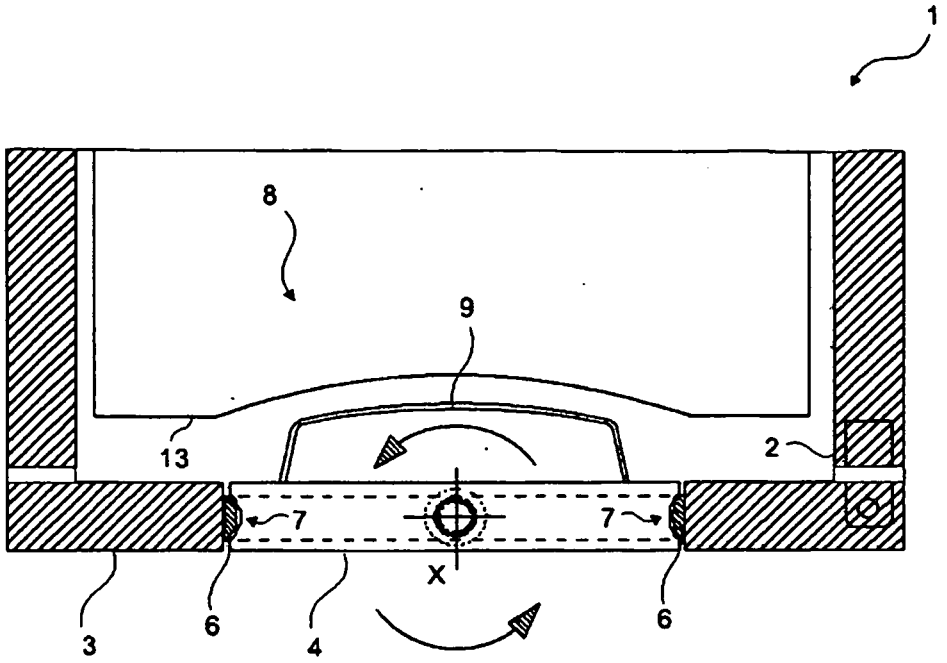
10. Un dispositif de refroidissement (1) selon les revendications 7 et 8, **caractérisé par** une butée (7) sous forme d'une protubérance.

11. Un dispositif de refroidissement (1) selon les revendications 7 à 10, **caractérisé par** une butée (7) qui est positionnée aux bords opposés de l'ouverture (5), symétriquement au point médian de l'ouverture (5) où ses axes horizontal et vertical coïncident.

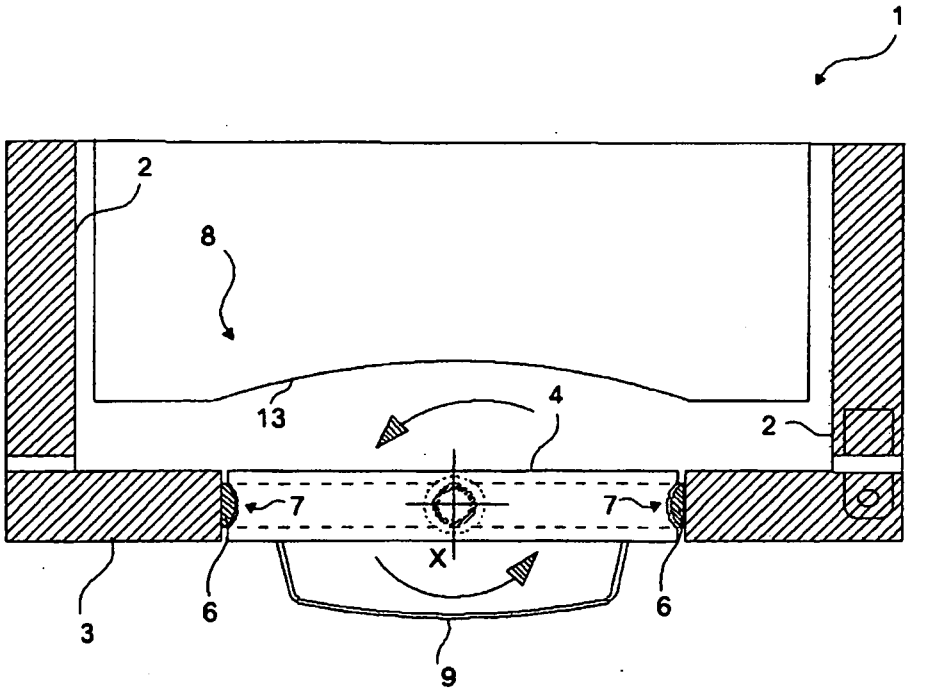
12. Un dispositif de refroidissement (1) selon les revendications 7 et 9 à 11, **caractérisé par** une butée (7) qui est positionnée aux bords opposés de la porte supplémentaire (4), symétriquement au point médian de la porte supplémentaire (4) où ses axes horizontal et vertical coïncident.

13. Un dispositif de refroidissement (1) selon l'une quelconque des revendications précédentes, **caractérisé par** une étagère intérieure (13) dans le volume interne de dispositif de refroidissement (8) qui est sous la forme de la trajectoire suivie par les bords de la porte supplémentaire (4), de telle manière que le mouvement de la porte supplémentaire (4) n'est pas bloqué.

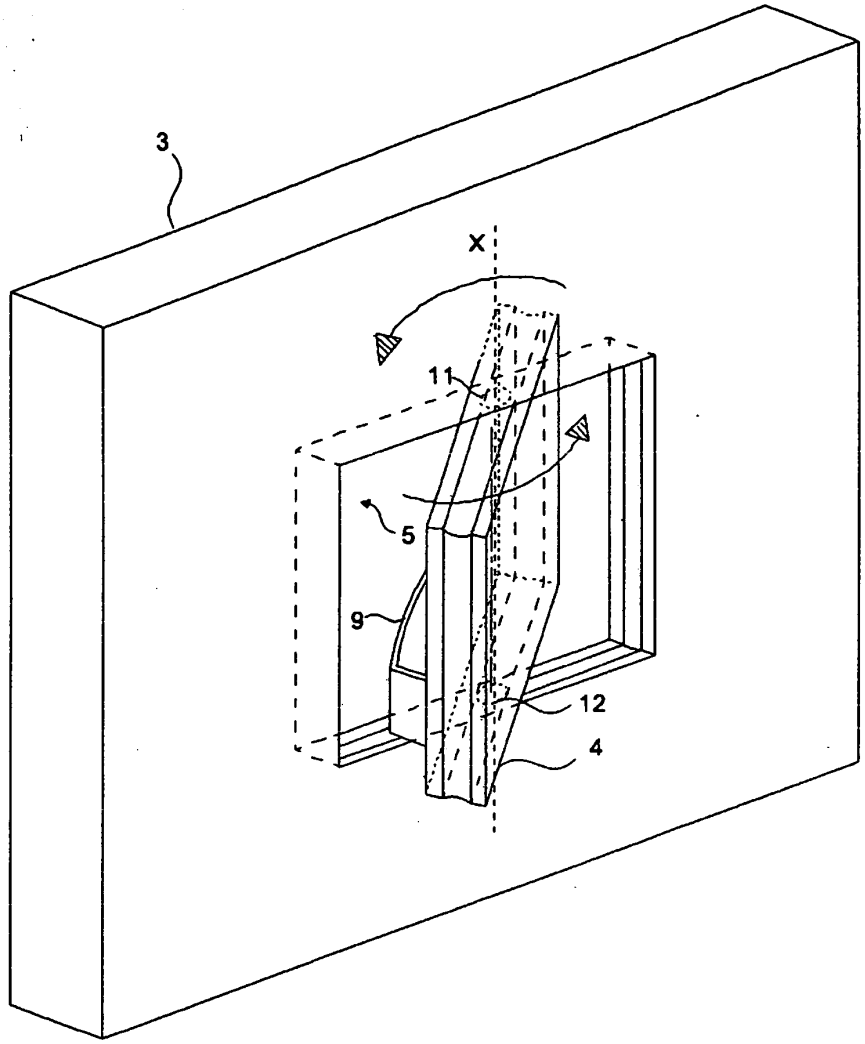
[Fig. 001]



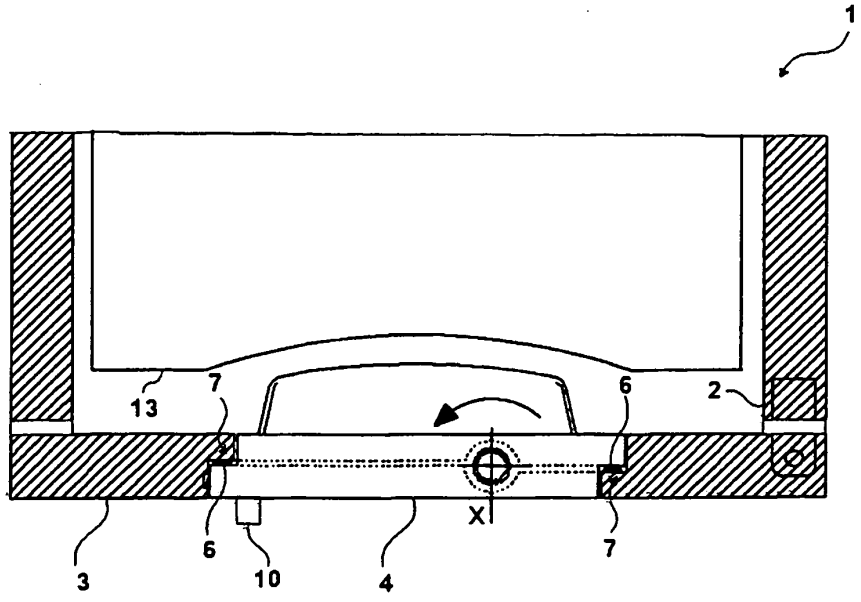
[Fig. 002]



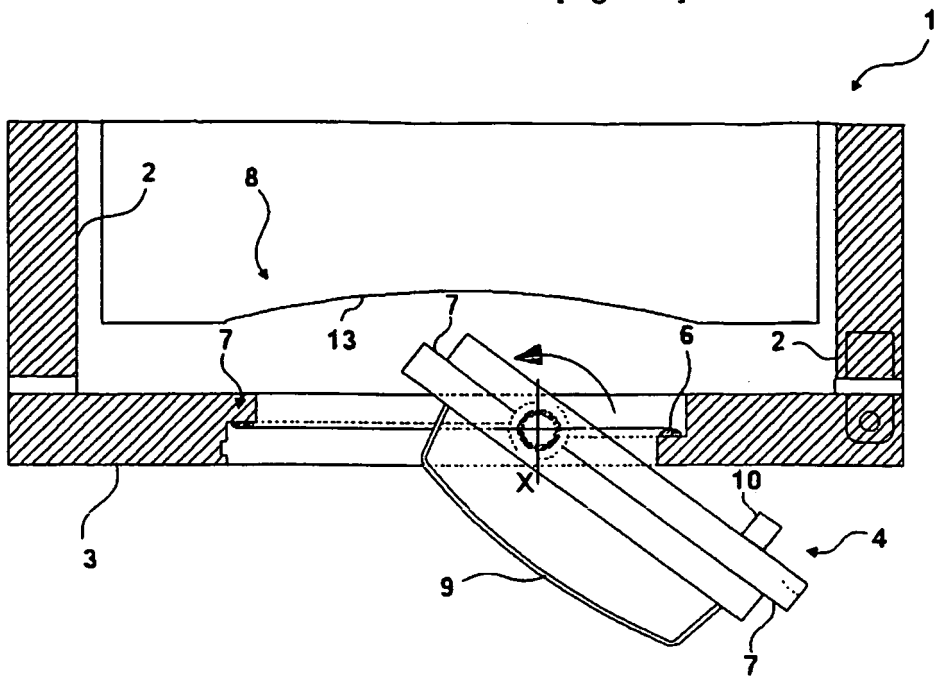
[Fig. 003]



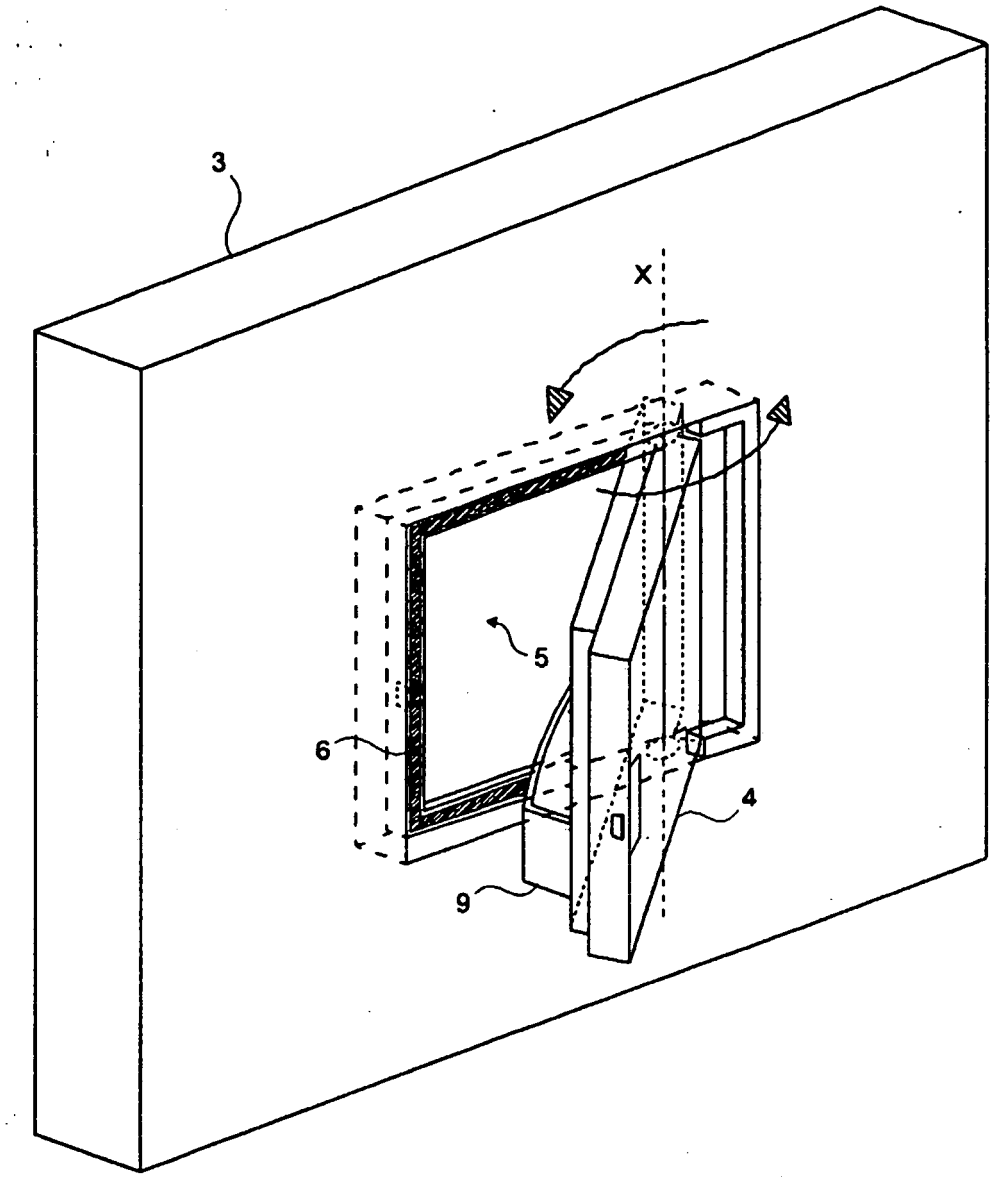
[Fig. 004]



[Fig. 005]



[Fig. 006]



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 5209082 A **[0004]**
- WO 9901704 A **[0005]**
- EP 1329679 A **[0006]**