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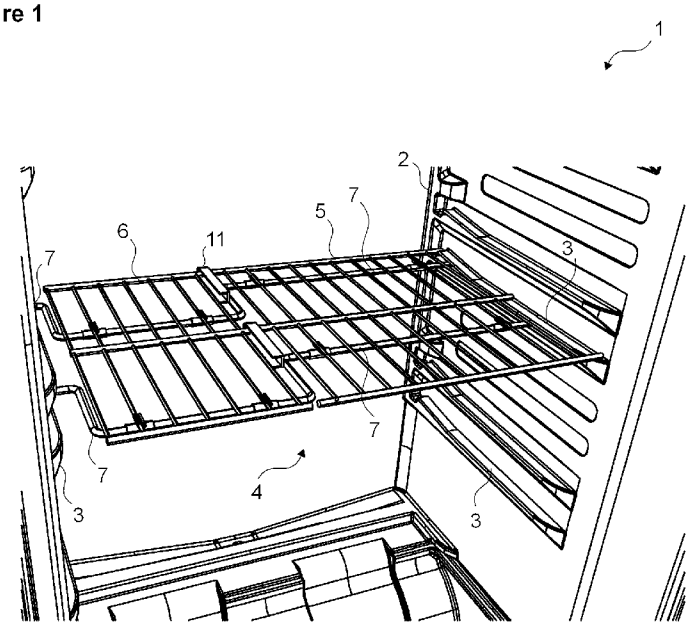
(54) **Title:** A COOLING DEVICE

Figure 1



(57) **Abstract:** The present invention relates to a cooling device comprising a body (2), at least one shelf (4) with one fixed carrier (5) and one mobile carrier (6) placed in the body (2) vertically and used for articles to be placed thereon, and shelf supports (3) placed oppositely on the body side walls carrying the shelves (4).

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Description

A COOLING DEVICE

[0001] The present invention relates to a cooling device that comprises a shelf enabling effective utilization of the article storage volume.

[0002] In cooling devices, for example in refrigerators and deep-freezers, various types of stepped, foldable and telescopic shelves, bottle retainers and the similar are used for more compact storage of the articles like bottles and food-beverage containers and for easy placement and removal of the articles by the user in order to utilize the interior space effectively.

[0003] In the state of the art, the stepped shelves used in cooling devices comprise of two support surfaces one being at a higher level and the other at a lower level. The shelf is mounted within the body in such a way that one of the support surfaces stands on the right side and the other one on the left side thereby having one edge of each support surface secured to a shelf canal on the side wall of the body.

[0004] Each support surface on different levels is supported only from one edge, since the stepped shelf having support surfaces on different levels from right to left is mounted to a shelf canal on each side wall when looked at the cooling device from the front perspective. From frontal view, the edges of the support surfaces, which are situated on the front and the rear side of the body and joined with each other by means of a step, are not supported by the side walls. This causes rigidity problem and may lead to flexure and imbalance especially in situations whereby the load on the shelf is excessive.

[0005] In the state of the art, the United States of America Patent Document No US2717189, a refrigerator wherein a stepped shelf which can be used with various combinations is explained. Thus, placing articles at variable heights into the body is enabled.

[0006] In this embodiment the stepped shelf has a rigid structure. However, the utilization of stepped shelf may not always be required during use. Besides, in order to make it possible to change the direction of the step, all the articles on the shelf have to be removed and be replaced again.

[0007] In the state of the art, the United States of America Patent Document No

US2319470, a shelf comprising a fixed carrier and two mobile carriers all connected articulately to each other via the fixed carrier and having a usage volume, adjustable by folding these carriers to store short and tall articles is explained.

[0008] In the state of the art, the United States of America Patent Document No US5584405, an adjustable shelf used in refrigerators is described. The adjustable shelf comprises a platform and a support member slidably attached to the platform and supports the platform by means of leaning to another shelf or to the body wall.

[0009] In these embodiments, which appear in the state of the art; the part of the adjustable shelf, under which tall bottles and articles could be placed is folded in order to enable the placement of the tall bottles and articles on the shelf below the adjustable shelf. However, folding the shelf causes a decrease in the carrying surface area of the shelf.

[0010] In the state of the art, in the United States of America Patent Document No US2004195945, the distance between the shelf disposed between the body side walls and hanged by means of arms, and the other shelves above or below can be changed according to the movement of the shelf on the arms.

[0011] In this embodiment, not the whole shelf but only one part of the shelf is desired to meet the aim described above only one side of the shelf can be bent. However, cylindrical packaged articles placed on the shelf can roll around and therefore be damaged, when the said side of the shelf is bent and an inclined surface is created.

[0012] The aim of the present invention is the realization of a cooling device comprising user friendly shelves which enable effective use of article storage space inside the body and provide diverse utilization options to the user.

[0013] A cooling device realized in order to attain the aim of the present invention explicated in the first claim and the respective claims thereof, comprises a rod in the form of a wire, which is bent into a “U” shape, shifts the mobile carrier in a parallel way to the plane of the fixed carrier when rotated around its own axis and places the mobile carrier in a position above or

below the plane of the fixed carrier by means of oscillation movement.

[0014] When rotated, the rod also brings the mobile carrier, which is below or above the fixed carrier, to the same level as the fixed carrier. Thus, by means of the rod, the shelf is provided to be supported and at the same time the mobile carrier is enabled to shift to three different positions in balance without any requirement to remove the articles on it.

[0015] By means of the second support and arms formed by bending the rod in "U" shape, when the rod is rotated around its own axis the movement of the mobile carrier mounted on the second support on the arms vertical to the axis of its rotation and the formation of a level difference between the mobile carrier and the level of the fixed carrier by shifting as much as the length of the arms is provided.

[0016] Both carriers are connected to the rod by means of the grip mechanism. Grip mechanism comprises a retainer, which embeds the rod wrapping partially and enables the movement mechanism to rotate around its own axis, and a guide, which lies on the retainer vertically and enables the mobile carrier to move back and forth on a horizontal line. Thus, the mobile carrier can be pushed in or pulled out by means of the guide, while the rod embedded in the carrier is rotating around its own axis.

[0017] Besides, by means of the locking canal, which is located on the adjacent edge of the fixed carrier to the mobile carrier, and the lock mechanism, which is located on the adjacent edge of the fixed carrier to the mobile carrier, and comprises a protrusion-formed locking pin, the mobile carrier is enabled to stay in balance at the same level with the fixed carrier.

[0018] The second support and the arms are located on the same horizontal plane when the mobile carrier and the fixed carrier stay at the same level. When the mobile carrier stays above the plane of the fixed carrier, the second support is located above the plane of the fixed carrier and is as much as the length of an arm. When the mobile carrier stays below the plane of the fixed carrier, the second support is located below the plane of the fixed carrier and the distance in between is again as much as the length of an arm.

[0019] In an embodiment of the present invention, the fixed and the mobile carrier

are in plate form.

[0020] In another embodiment of the present invention, the fixed and the mobile carrier are formed by bringing the wires close together to form a mesh.

[0021] The present invention enables a shelf comprising of two parts, one with a mobile carrier and the other with a fixed carrier to be used in three different positions. Flexible use of the shelves provides both user satisfaction and effective storage in the cooling device.

[0022] A cooling device realized in order to attain the aim of the present invention is illustrated in the attached figures, where:

[0023] Figure 1 – is the perspective view of the shelf in a cooling device, when a fixed carrier and a mobile carrier are at the same level.

[0024] Figure 2 - is the perspective view of the mobile carrier in the cooling device being pulled out.

[0025] Figure 3 - is the perspective view of the shelf in the cooling device, when the mobile carrier is in the upper position.

[0026] Figure 4 - is the perspective view of the shelf in the cooling device, when the mobile carrier is in the lower position.

[0027] Figure 5 - is the perspective view of a grip mechanism.

[0028] Figure 6 - is the schematic view of a rod.

[0029] The elements illustrated in the figures are numbered as follows:

1. Cooling device
2. Body
3. Shelf support
4. Shelf
5. Fixed carrier
6. Mobile carrier
7. Rod
8. Retainer
9. Guide
10. Lock mechanism
11. Locking canal
12. Locking pin
13. Grip mechanism

14. First support
15. Second support
16. Arm

[0030] The cooling device (1) comprises a body (2), at least one shelf (4), which is disposed in the body vertically, whereon articles are placed, and which comprises one fixed carrier (5) and one mobile carrier (6); and shelf supports (3) placed on the body side walls oppositely carrying the shelves (4) with at least one rod (7),

- which lies between two body side walls (2), seating on the abreast shelf supports (3),
- whereon both the fixed carrier (5) and mobile carrier (6) are placed,
- whose part on which the mobile carrier (6) is mounted is bent in "U" shape,
- which is rotated around the dots seated on the shelf supports (3),
- which moves (shifts) the mobile carrier (6) parallel to the plane of the fixed carrier (5),
- which brings the mobile carrier (6) to a position below the plane of the fixed carrier (5) or to a position above the plane of the fixed carrier (5).

[0031] The rod (7) furthermore brings the mobile carrier (6) below or above the plane of the fixed carrier (5) to the same level as the plane of the fixed carrier (5).

[0032] The cooling device (1) comprises two simultaneously moving rods (7) placed under the shelf (4) parallel to each other. Thus, more balanced movement and support of the shelves (4) are provided.

[0033] The rod (7) comprises a first support (14), which supports the fixed carrier (5) by means of being mounted under the fixed carrier (5) and the end of which is seated on a shelf support (3); two arms (16) formed by being bent in "U" shape vertically to the axis of rotation, one connected to the first support (14), the other seated on the shelf support (3); and a second support (15) located between the arms (16), whereon the mobile carrier (6) is mounted and which enables the mobile carrier (6) to be shifted in order to make oscillation movement while rotating around its own axis (Figure 6).

[0034] The cooling device (1) furthermore comprises one or more than one grip

mechanism (13), which enables the fixed and the mobile carriers (5 and 6) to be mounted on the rod (7). The grip mechanism (13) comprises a retainer (8), which is mounted on the rod (7) and embeds the wire-shaped rod (7) during the rotation movement and a guide (9) on every retainer (8), which lies vertically to the direction of the retainer (8) and is mounted on the fixed and mobile carrier (5 and 6) (Figure 5). Direction of the retainer (8) is the same as that of rod (7). The guide (9) enables especially the mobile carrier (6) to move back and forth on a horizontal line with the pulling and repelling force applied by the user.

[0035] The cooling device (1) furthermore comprises one or more than one lock mechanism (10), which enables the mobile carrier (6) and the fixed carrier (5) to stand at the same level in balance. The lock mechanism (10) comprises a locking canal (11), which is located on the adjacent edge of the fixed carrier (5) to the mobile carrier (6), and a protrusion-formed locking pin (12) located on the adjacent edge of the fixed carrier (5) to the mobile carrier (6), which fits in the locking canal (11) when the mobile carrier (6) and the fixed carrier (5) are at the same level.

[0036] The fixed and mobile carriers (5 and 6) can be used as a flat shelf (4) when the both are on the same plane. The arms (16) and the second support (15), connecting the arms (16) lying interjacently therebetween, are located on the same horizontal plane, when the fixed and mobile carriers (5 and 6) are at the same level. Thus, the mobile carrier (6) is also located on the same plane without a level difference with the fixed carrier (5). In this position, the locking pin (12) is seated in the locking canal (11) (Figure 1).

[0037] The user pulls the mobile carrier (6) from the facing edge, when an article taller than the distance between two shelves (4), such as a bottle, is desired to be placed on the shelf (4), in other words, when the mobile carrier (6) is desired to be carried to a position above the plane of the fixed carrier (5). By means of this force, the mobile carrier (6) moves in the guide (9) and moves towards the user. This movement continues until the locking pin (12) is released from the locking canal (11). As a result of this movement, the rear edge of the mobile carrier (6) becomes distant from

the rear wall of the cooling device (1). The gap that occurs between the rear wall of the cooling device (1) and the rear edge of the mobile carrier (6) enables the mobile carrier (6) to rotate with the rod (7). This gap is enough for the locking pin (12) to be released from the locking canal (11) (Figure 2). The user does not pull the mobile carrier (6) but applies a force upwards to lift the mobile carrier (6) when the locking pin (12) is released from the locking canal (11). As a result of this force, the rod (7) rotates around its own axis and the mobile carrier (6) is shifted upwards in a position parallel to the plane of the fixed carrier (5), making an oscillation movement. The second support (15) heightens by means of the arms (16), when the rod (7) is rotated almost 90 degrees. This causes the mobile carrier (6) mounted on the second support (15) to heighten as much as the length of an arm (16). Meanwhile, the gap occurred between the rear edge of the mobile carrier (6) and the rear wall of the cooling device (1) by the mobile carrier (6) being pulled frontwards initially, is closed when the rear edge of the mobile carrier (6) leans against the rear wall of the cooling device (1). In this position, there is a height difference between the fixed carrier (5) and the mobile carrier (6) as much as the length of an arm (16). Thus, by means of increasing the distance between the shelf below (4) and the mobile carrier (6) as much as the length of an arm (16), tall bottles can be placed into the part of the shelf below, which comes across the mobile carrier (6). Furthermore, removing the articles placed on the mobile carrier (6) is not required since the mobile carrier (6) always moves keeping its parallelism to the plane of the fixed carrier (5) during this transposition (Figure 3).

[0038] When the mobile carrier (6) is desired to be carried to a position below the plane of the fixed carrier (5), the user again pulls the mobile carrier (6) from the facing edge (Figure 2). As a result of this force, the mobile carrier (6) moves towards the user in the guide (9) and the locking pin (12) is released from the locking canal (11). When the locking pin (12) is released from the locking canal (11), the rod (7) rotates and the mobile carrier (6) makes downward oscillation movement by its own gravity parallel to the plane of the fixed carrier (5). The second support (15) lowers by means of

the arms (16), when the rod (7) is rotated almost 90 degrees. This causes the mobile carrier (6) mounted on the second support (15) to lower as much as the length of the arms (16). Meanwhile, the gap occurred between the rear edge of the mobile carrier (6) and the rear wall of the cooling device (1) by the mobile carrier (6) being pulled frontwards initially, is closed when the rear edge of the mobile carrier (6) leans against the rear wall of the cooling device (1). In this position, there is a height difference between the fixed carrier (5) and the mobile carrier (6) as much as the length of an arm (16). Thus, the distance between the shelf above (4) and the mobile carrier (6) is increased as much as the length of an arm. The bottles taller than the distance between the shelf above (4) and the fixed carrier (5) can easily be placed on the mobile carrier (6) in the lower position. Furthermore, removing the articles placed on the mobile carrier (6) is not required, since the mobile carrier (6) always moves keeping its parallelism to the plane of the fixed carrier (5) during this transposition (Figure 4).

[0039] When the mobile carrier (6) is desired to be at the same level as the fixed carrier (5), it is rotated 90 degrees downwards if it is above the plane of the fixed carrier (5); on the other hand, it is rotated 90 degrees upwards if it is below the plane of the fixed carrier (5). As a result of this movement, the mobile carrier (6) is brought to the same horizontal level as the fixed carrier (5). However, in this situation the mobile carrier (6) is located in front of the fixed carrier (5) at a distance equal to that of the gap, created as a result of the user pulling mobile carrier (6) frontwards initially. When the mobile carrier (6) is pushed by the user, the gap is removed, therefore both the mobile carrier (6) is brought to the same level as the fixed carrier (5) vertically and the locking pin (12) is enabled to be inserted into the locking canal (11).

[0040] In an embodiment of the present invention, the fixed and the mobile carrier (5 and 6) are in plate form.

[0041] In another embodiment of the present invention, the fixed and the mobile carrier (5 and 6) are formed by means of bringing the wires close together to form a mesh. In this embodiment, these wires are seated in the guides

(9).

[0042] By means of the present invention, various combinations are created in order to provide alternative loading possibilities to the user. At the same time, a two-pieced shelf (4) is provided to be used in three positions in steps. Furthermore, not requiring the articles placed on the shelves to be removed during transpositions provides both time saving and ease of use.

Claims

1. A cooling device (1) comprising a body (2), at least one shelf (4), which is disposed in the body vertically, whereon articles are placed, and which comprises one fixed carrier (5) and one mobile carrier (6); and shelf supports (3) placed on the body side walls oppositely carrying the shelves (4), and characterized by at least one rod (7),
   - which lies between two body side walls (2), seating on the abreast shelf supports (3),
   - whereon both fixed carrier (5) and mobile carrier (6) are placed,
   - which is bent in "U" shape from the part where the mobile carrier (6) is mounted,
   - which is rotated around the dots seated on the shelf supports (3),
   - which shifts the mobile carrier (6) in a parallel way to the plane of the fixed carrier (5),
   - which brings the mobile carrier (6) to a position below the plane of the fixed carrier (5) or to a position above the plane of the fixed carrier (5).
2. A cooling device (1) as in Claim 1, characterized by a rod (7) that brings the mobile carrier (6) which is below or above the plane of the fixed carrier (5) to the same level as the plane of the fixed carrier (5).
3. A cooling device (1) as in Claim 1, characterized by two simultaneously moving rods (7) that are placed under the shelf (4) parallel to each other.
4. A cooling device (1) as in Claim 1, 2 or 3, characterized by a rod (7) that comprises a first support (14), which supports the fixed carrier (5) by being mounted under the fixed carrier (5) and the end of which is seated on a shelf support (3); two arms (16) formed by being bent in "U" shape vertically to the axis of rotation, one connected to the first support (14), other seated on the shelf support (3); and a second support (15) located between the arms (16), whereon the mobile carrier (6) is mounted and which enables the mobile carrier (6) to be shifted in order to make oscillation movement while rotating around its own axis.
5. A cooling device (1) as in any one of the above claims, comprising a retainer (8), which is mounted on the rod (7) and embeds the rod (7) during the rotation movement, and a guide (9) on every retainer (8), which lies vertically to the

direction of the retainer (8) and is mounted on the fixed and mobile carrier (5 and 6); characterized by one or more than one grip mechanism (13) enabling the fixed and the mobile carriers (5 and 6) to be mounted on the rod (7).

6. A cooling device (1) as in any one of the above claims, characterized by one or more than one lock mechanism (10), which enables the mobile carrier (6) and the fixed carrier (5) to stand at the same level in balance.
7. A cooling device (1) as in Claim 6, characterized by a lock mechanism (10) comprising a locking canal (11), which is located on the adjacent edge of the fixed carrier (5) to the mobile carrier (6), and by a protrusion-formed locking pin (12) located on the adjacent edge of the fixed carrier (5) to the mobile carrier (6), which fits in this locking canal (11) when the mobile carrier (6) and the fixed carrier (5) are at the same level.
8. A cooling device (1) as in any one of the above claims, characterized by fixed and mobile carriers (5 and 6) in plate form.
9. A cooling device (1) as in any one of the claims between 1 and 7, characterized by fixed and mobile carriers (5 and 6) formed by bringing the wires close together to form a mesh.

Figure 1

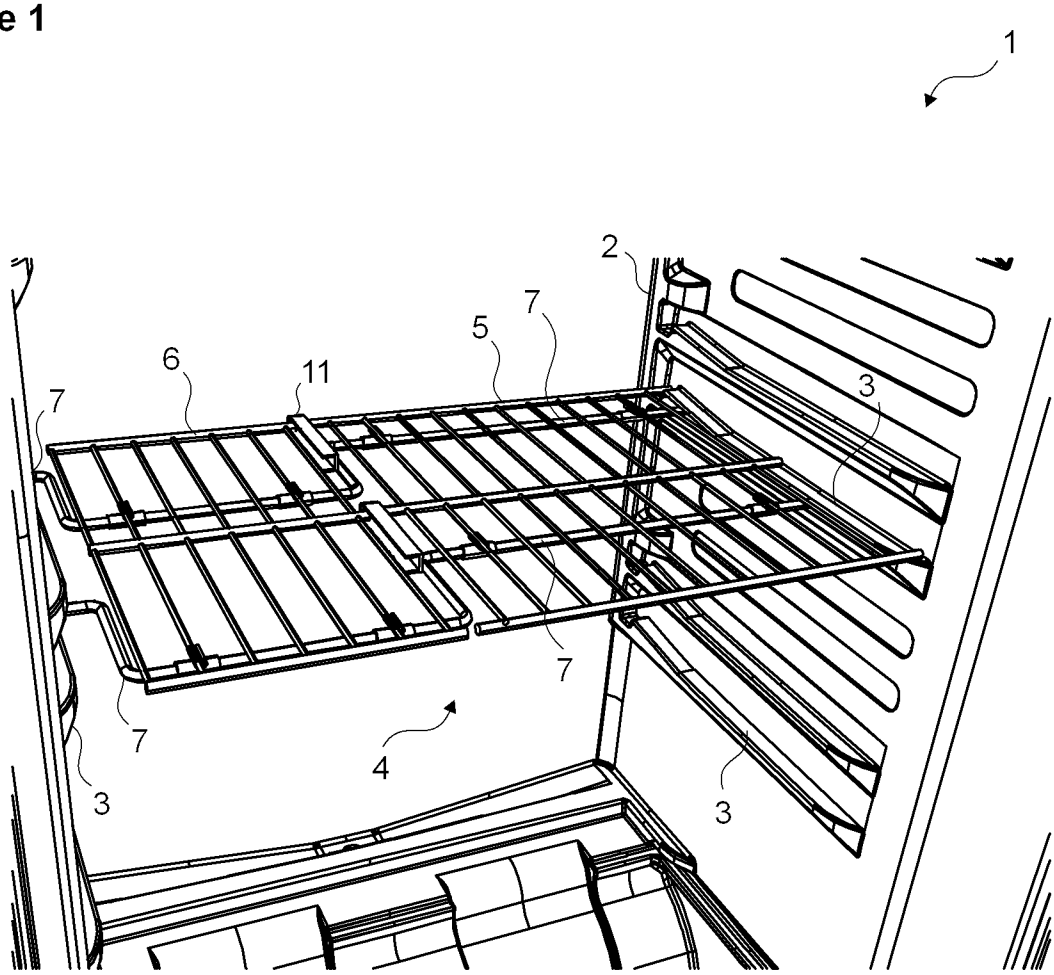

Figure 2

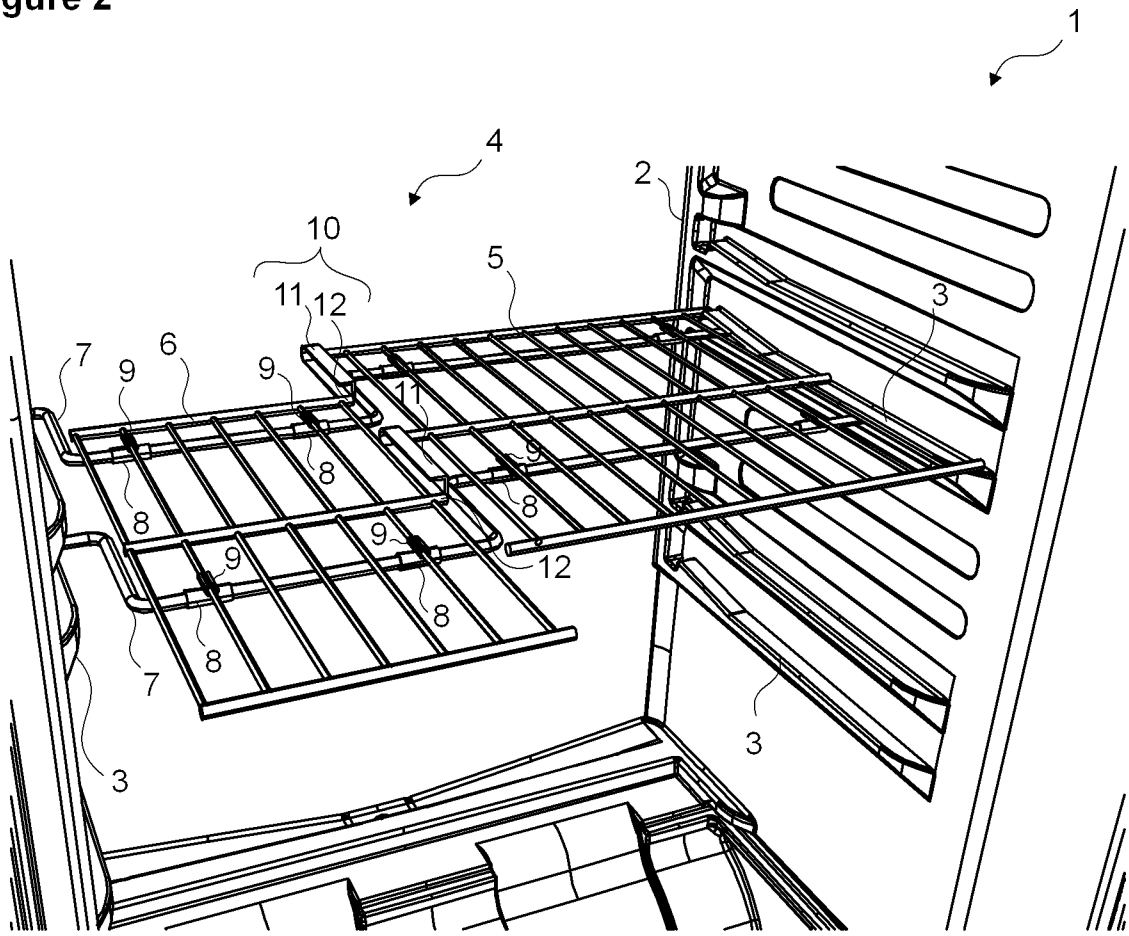

Figure 3

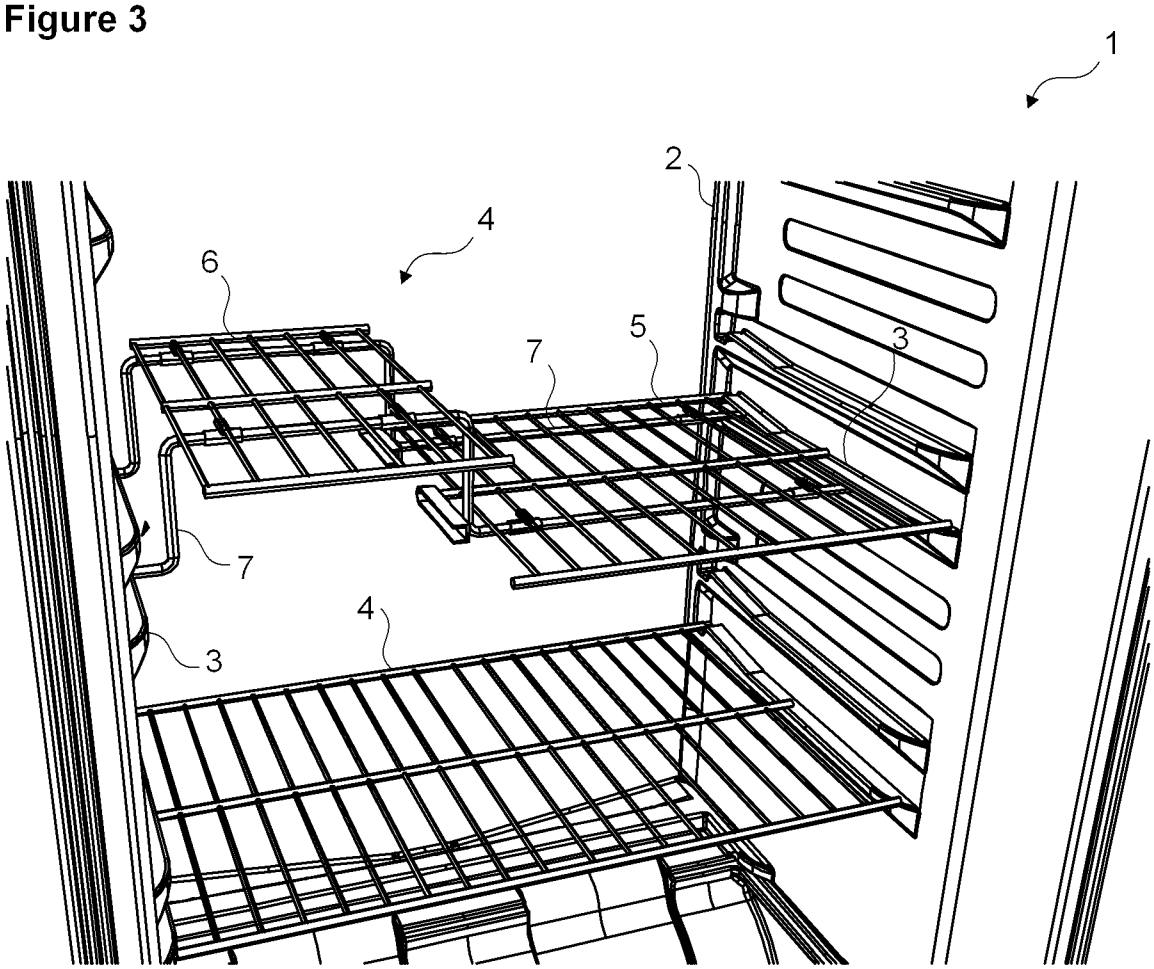

Figure 4

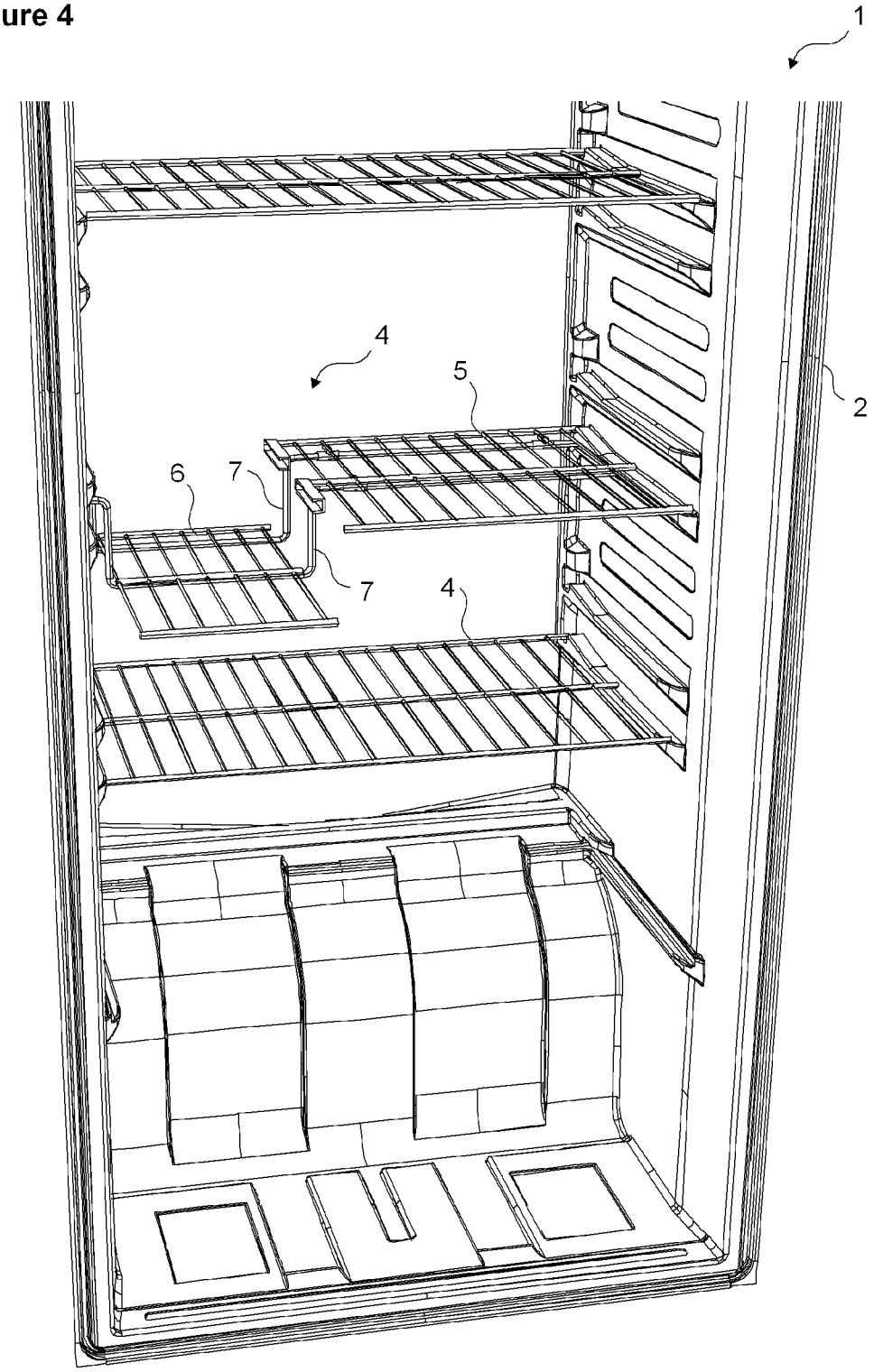

Figure 5

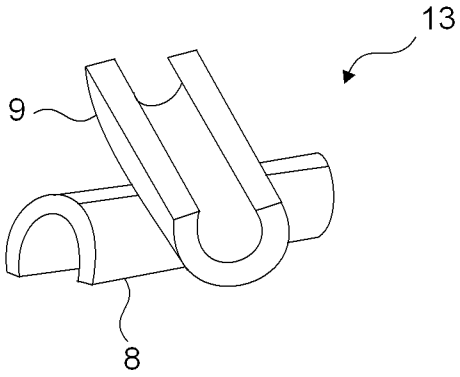

Figure 6