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(54) **A COOLING DEVICE**

KÜHLVORRICHTUNG

DISPOSITIF DE REFROIDISSEMENT

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EP 2 062 001 B1

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Description

[0001] The present invention relates to a cooling device, comprising shelves that provide efficient utilization of the inner space.

[0002] In cooling devices, preferably in refrigerators, one or more shelves are displaced or places thereof are changed to store big sized, tall food or beverage containers. In state of the art, shelf systems are used that are foldable or telescopic, entirely dismounted from inside of the cooling device when desired then mounted again for the purpose of forming flexible usage volumes for storing containers of various sizes. This type of shelf systems should also be conveniently structured.

[0003] In the Great Britain Patent no. GB 1191596, a shelf used in a refrigerator is described having a variable area supporting surface comprising of spaced slats slidably engaged by apertures in their ends adjacent ends of adjacent slots being movable towards each other against a spring bias.

[0004] In the United States of America Patent no. US 5584405 an adjustable shelving system utilized in a refrigerator is described. The adjustable shelf is composed of a platform and a support member slidably attached to the platform, supporting the platform by resting on another lower shelf or the compartment wall.

[0005] The state of the art adjustable or foldable shelves occupy a considerable space inside the cooling device even when not-in-use positions and flexibility of utilization cannot be provided. On the other hand, taking out these shelves altogether from the cooling device when not in use still presents hardships in storing due to their sizes.

Patent specification EP-A-1 906 122 (comprised in the state of the art in accordance with Article 54(3) EPC) describes a refrigerator with a rollable shelf.

[0006] The object of the present invention is to design a cooling device comprising shelves providing efficient utilization of the inner space which can be easily opened, closed, taken out altogether when desired and stored without occupying much space.

[0007] The cooling device designed to fulfill the objective of the present invention is explained in attached claims.

[0008] The cooling device of the present invention comprises one or more shelves used for storing items thereon, having an openable/closable feature.

[0009] The shelf comprises a support surface, which can be wrapped to form a roll in the not-in-use (closed) position, and in the in-use (open) position stretched to constitute the load bearing part of the shelf. Opening, closing of the support surface hence the shelf is provided by wrapping and unwrapping around a shaft fixed from one end that is rotatable around its axis. The opened support surface is hung to the wall of the cooling device by a retainer at the free end, unattached to the shaft, and thus the support surface can resume the load bearing position. At least one stopper is provided on the wall of

the cooling device where to this retainer can be attached. The stopper is configured as a recess wherein the retainer is inserted or a pin on which it is attached.

[0010] The shelf comprises a casing that houses the support surface wrapped into a roll in closed position and the shaft around which the support surface is wrapped around by attaching from one side. The casing is shaped as a rectangular prism with an opening on one side for allowing entry or exit of the support surface. The casing prevents the support surface from getting dirty when kept in the closed position for a long time or when taken out to be stored outside of the cooling device. Besides, the casing holds all the components of the shelf together in an orderly manner and thus provides ease of utilization while the shelf is mounted or dismounted from the cooling device.

[0011] The support surface is manufactured of a resilient material that is suitable for wrapping into a roll or for currying a load when stretched. In an embodiment of the present invention, the support surface has a perforated structure. Consequently, when fruits-vegetables are placed directly on the support surface, without placing in a container, the foodstuff can inhale air thus their shelf lives are prolonged.

[0012] In the preferred embodiment of the present invention, a bias means is provided inside the casing, to which the shaft is connected that limits the movement of the shelf in the direction of opening, and supporting the motion in the direction of closing. The spring that is compressed by the rotational movement of the shaft while bringing the shelf to the open position, exerts a force that pulls the support surface and thus helps the support surface to stop and bear load when the support surface is fixed to the wall of the cooling device by means of the retainer. As a result of the same force, when the support surface is released it moves to automatically resume the closed position, that is, is wrapped on the rotating shaft.

[0013] The shelf is mounted to the side walls or the rear wall inside the cooling device. In the preferred embodiment of the present invention, the cooling device comprises more than one housing allowing the user to mount the shelf at different heights or to different walls as desired.

[0014] In an embodiment of the present invention, the housing is disposed on one of the side walls of the cooling device and the stopper(s) on the other. In this embodiment, when the shelf is brought to the open position, the support surface becomes stretched between the two side walls of the cooling device.

[0015] In another embodiment of the present invention, the housing is disposed on the rear wall and the retainers are disposed on both side walls of the cooling device. In this embodiment, when the shelf is brought to the open position, the support surface becomes stretched from the rear wall towards the front wall in the cooling device. The stoppers are placed at different positions on the side walls that will allow the support surface to stretch to partially or entirely cover the depth of the

cooling device.

[0016] In this embodiment, the user pulls the support surface as much as desired according to the required space and fixes the support surface by attaching the retainers to the stoppers suitable for that position. When the user secures the support surface such that some portion of the cooling device depth is covered, both an extra support surface is provided in the cooling device and also the height of the food and beverage containers to be stored on the fixed shelf underneath is not entirely restricted. For example, when the shelf is fixed in the open position by pulling to half the depth of the cooling device, a plurality of low height (H1, H1-H2) food and beverage containers can be stored at the rear portion of both the lower shelf and the support surface above. On the other hand, high (H 1) food and beverage containers can still be stored at the front portion. In other words, a storing area that is double story at the rear and single story at the front is formed.

[0017] The cooling device designed to fulfill the objective of the present invention is illustrated in the attached figures, where:

[0018] Figure 1 - is the perspective view of the shelf in the closed position in an embodiment of the present invention.

[0019] Figure 2 - is the perspective view of the shelf in the open position in an embodiment of the present invention.

[0020] Figure 3 - is the perspective view of the shelf in the open position in another embodiment of the present invention.

[0021] Figure 4 - is the partial cross sectional view of the shelf in the open position that is used in an embodiment of the present invention.

[0022] Figure 5 - is the perspective view of the shelf in the closed position that is used in an embodiment of the present invention.

[0023] Figure 6 - is the perspective view of the shelf in the open position that is used in an embodiment of the present invention.

[0024] The elements illustrated in the figures are numbered as follows:

1. Cooling device
2. Shelf
3. Housing
4. Support surface
5. Casing
6. Shaft
7. Retainer
8. Stopper

[0025] The cooling device (1) comprises one or more shelves (2) for storing items thereon, one or more housings (3) situated on one of the inner walls, for supporting the shelf (2) in the closed position and holding it at the desired level.

[0026] The shelf (2) comprises a support surface (4)

that is wrapped into a roll in the closed position, and stretched to form the load bearing part of the shelf (2) in the open position and a shaft (6) to which the support surface (4) is attached from one side to be wrapped around into a roll.

[0027] The shelf (2) furthermore comprises at least one retainer (7) that is attached to the wall(s) of the cooling device (1) when the support surface (4) is brought to the open position to keep it open and a casing (5) that houses the support surface (4) wrapped into a roll in the closed position and the shaft (6) around which the support surface (4) is wrapped by attaching from one side. The casing (5) is configured as a rectangular prism with an opening on one side to allow for entry, exit of the support surface (4). The shaft (6) is disposed inside the casing (5) such that it can rotate around its own axis.

[0028] In the preferred embodiment of the present invention, the cooling device (1) furthermore comprises at least one stopper (8) where to the retainer(s) are attached hence providing the shelf (2) to be secured in the open position. The stopper (8) is configured as a recess wherein the retainer (7) is inserted or a pin to which the retainer (7) is attached.

[0029] When the shelf (2) is mounted inside the cooling device (1), it is seated in a suitably sized housing (3) on one of the cooling device (1) walls. The shelf (2) can be easily displaced from the housing (3) by the user when in the closed position, taken out of the cooling device (1) and afterwards can be mounted in the desired position.

[0030] The support surface (4) is manufactured of a resilient material that is suitable for both being wrapped into a roll or for bearing a load when stretched. One side of the support surface (4) is secured on the shaft (6). Accordingly, when the shaft (6) rotates, the support surface (4) is wrapped around the shaft (6) into a roll. In an embodiment of the present invention, the support surface has a perforated structure.

[0031] In the preferred embodiment of the present invention, the shelf (2) comprises a bias means arranged inside the casing (5), which is compressed by the rotational movement of the shaft (6) while bringing to the open position, providing to automatically resume the closed position when released. When the shelf (2) is pulled by the user for opening, the shaft (6) rotates and the support surface (4) attached to the shaft (6) opens. The shaft (6) while rotating in the direction of opening of the support surface (4), also compresses the bias means to which it is attached. The retainer (7) on the free end of the support surface (4) is secured to the stopper (8) arranged on the inner wall of the cooling device (1) for bringing the shelf (2) to the open position. In this position, the bias means, since compressed, pulls the support surface (4) and holds to stay stretched. For bringing the shelf (2) to the closed position, when the user detaches the retainer (7) to release from the stopper (8), the support surface (4) that is pulled by the force exerted by the bias means, is again wrapped around the shaft (6).

[0032] In an embodiment of the present invention, the

housing (3) is arranged on one of the side walls of the cooling device (1) and the stopper(s) on the other. In this embodiment, when the shelf (2) is brought to the open position, the support surface (4) becomes stretched between the two side walls of the cooling device (1)

[0033] In another embodiment of the present invention, the housing (3) is disposed on the rear wall and the stoppers (8) are disposed on both side walls of the cooling device (1). In this embodiment, when the shelf (2) is brought to the open position, the support surface (4) becomes stretched from the rear wall towards the front wall in the cooling device (1). The stoppers (8) are placed at different positions on the side walls that will allow the support surface (4) to stretch such that the depth of the cooling device (1) is partially or entirely covered. The user pulls the support surface (4) as much as desired according to the required space and secures the support surface (4) by attaching the retainers (7) to the stoppers (8) suitable for that position.

[0034] For example, when the support surface (4) is secured to half the depth of the cooling device (1), high (H1) food and beverage containers can still be stored to the front portion of the fixed shelf (A) underneath. At the same time, the total shelf area for storing lower height (H1, H1-H2) food and beverage containers at the rear is increased by an extra area gained with the support surface (4) at the rear. Consequently, food and beverage containers of two different heights (H1, H2) can now be supported on the fixed shelf (A) underneath by pulling and securing the shelf (2) to half the depth.

[0035] Since the shelf (1) of the present invention can be easily brought to a closed position when not in use and even detached from the cooling device (1), a flexible utilization volume for the user is provided that can be selectively changed. On the other hand, since the shelf (2) taken out of the cooling device (1) occupies a space inasmuch as the volume of the casing (5) in the closed position, a problem of storing does not arise.

Claims

1. A cooling device (1) comprising one or more shelves (2) for storing items thereon **characterized by** one or more housings (3) situated on one of its inner walls, for supporting the shelf (2) in the not-in-use position and holding at the desired level, the shelf (2) having a support surface (4) that is wrapped into a roll in the not-in-use position, and stretched to form the load bearing part of the shelf (2) in the in-use position, and a shaft (6) to which the support surface (4) is attached from one side to be wrapped around into a roll in the not-in-use position.
2. A cooling device (1) as in Claim 1, **characterized by** a casing (5) that houses the support surface (4) wrapped into a roll in the not-in-use position and the shaft (6) around which the support surface (4) is

wrapped, that is seated into the housing (3) for placing the shelf (2) inside the cooling device (1).

3. A cooling device (1) as in Claim 1 or 2, **characterized by** a shelf (2) comprising at least one retainer (7) for securing the support surface (4) to the wall(s) of the cooling device (1) when brought to the in-use position and for keeping it open.
4. A cooling device (1) as in Claim 3, **characterized by** at least one stopper (8) disposed on the inner walls, to which the retainer (7) situated on the end of the support surface (4) is secured
5. A cooling device (1) as in Claim 4, **characterized by** a stopper (8) in the form of a recess into which the retainer (7) can be inserted.
6. A cooling device (1) as in Claim 4, **characterized by** a stopper (8) in the form of a pin to which the retainer (7) can be secured.
7. A cooling device (1) as in any one of the above claim, **characterized by** a support surface (4) that is manufactured of a resilient material suitable for both wrapping into a roll or for bearing a load when stretched.
8. A cooling device (1) as in any one of the above claims, **characterized by** a support surface (4) that has a perforated structure.
9. A cooling device (1) as in any one of the above claims, **characterized by** a shelf (2) comprising a bias means arranged inside the casing (5), which is compressed by the rotational movement of the shaft (6) while bringing the shelf (2) to the in-use position, providing the support surface (4) be held stretched when the shelf (2) is in the in-use position and the shelf (2) to automatically resume the not-in-use position when released.
10. A cooling device (1) as in any one of the claims 4 to 9, **characterized by** a housing (3) disposed on one of the side walls and at least one stopper (8) on the other.
11. A cooling device (1) as in any one of the claims 4 to 9, **characterized by** a housing (3) disposed on the rear wall and at least two stoppers (8) disposed at different positions on the side walls such that the support surface (4) is stretched to partially or entirely cover the depth of the cooling device (1) and a shelf (2) providing food and beverage containers of two different heights (H1, H2) to be stored on the fixed shelf (A) underneath when the support surface (4) is partially opened.

Patentansprüche

1. Kühlvorrichtung (1), umfassend ein oder mehrere Regale (2), auf denen Gegenstände gelagert werden können, **gekennzeichnet durch** ein oder mehrere Gehäuse (3), die in einer ihrer Innenwände angeordnet sind und dazu dienen, das Regal (2) in der Nichtverwendungsposition tragen und es auf der gewünschten Höhe zu halten, wobei das Regal (2) eine Tragefläche (4) aufweist, die in der Nichtverwendungsposition zu einer Rolle aufgewickelt ist, und die in einer Verwendungsposition ausgezogen wird, um den Last tragenden Teil des Regals (2) zu bilden, und eine Welle (6), an der die Tragefläche (4) an einer Seite befestigt ist, um in der Nichtverwendungsposition zu einer Rolle aufgewickelt zu werden. 5
2. Kühlvorrichtung (1) nach Anspruch 1, **gekennzeichnet durch** eine Hülse (5), die die Tragefläche (4), die in der Nichtverwendungsposition zu einer Rolle aufgewickelt ist, sowie die Welle (6), um die die Tragefläche (4) gewickelt ist, aufnimmt, und die in das Gehäuse (3) gesetzt wird, damit das Regal (2) in der Kühlvorrichtung (1) angeordnet werden kann. 10 25
3. Kühlvorrichtung (1) nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** das Regal (2) wenigstens eine Halterung (7) aufweist, die dazu dient, die Tragefläche (4) an der Wand/den Wänden der Kühlvorrichtung (1) zu sichern, wenn die Tragefläche in die Verwendungsposition gebracht wird, und sie offen zu halten. 30
4. Kühlvorrichtung (1) nach Anspruch 3, **dadurch gekennzeichnet, dass** wenigstens eine Haltevorrichtung (8) an den Innenwänden angeordnet ist, an dem die Halterung (7) gesichert ist, die an dem Ende der Tragefläche (4) angeordnet ist. 35 40
5. Kühlvorrichtung (1) nach Anspruch 4, **dadurch gekennzeichnet, dass** die Haltevorrichtung (8) die Form einer Vertiefung aufweist, in die die Halterung (7) einführbar ist. 45
6. Kühlvorrichtung (1) nach Anspruch 4, **dadurch gekennzeichnet, dass** die Haltevorrichtung (8) die Form eines Zapfens aufweist, an dem die Halterung (7) gesichert werden kann. 50
7. Kühlvorrichtung (1) nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die Tragefläche (4) aus einem elastischen Material hergestellt ist, das sich sowohl zum Aufwickeln zu einer Rolle als auch zum Tragen einer Last in ausgezogenem Zustand eignet. 55
8. Kühlvorrichtung (1) nach einem der vorangehenden

Ansprüche, **dadurch gekennzeichnet, dass** die Tragefläche (4) eine perforierte Struktur aufweist.

9. Kühlvorrichtung (1) nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** das Regal (2) ein Vorspannmittel aufweist, das in der Hülse (5) angeordnet ist, und das durch die Drehbewegung der Welle (6) zusammengedrückt wird, wenn das Regal (2) in die Verwendungsposition gebracht wird, und das dazu dient, die Tragefläche (4) ausgezogen zu halten, wenn sich das Regal (2) in der Verwendungsposition befindet, wobei das Regal (2) bei Freigabe automatisch in die Nichtverwendungsposition zurückkehrt.
10. Kühlvorrichtung (1) nach einem der Ansprüche 4 bis 9, **dadurch gekennzeichnet, dass** ein Gehäuse (3) an einer der Seitenwände angeordnet ist und wenigstens eine Haltevorrichtung (8) an der anderen.
11. Kühlvorrichtung (1) nach einem der Ansprüche 4 bis 9, **dadurch gekennzeichnet, dass** ein Gehäuse (3) an der Rückwand angeordnet ist, und wenigstens zwei Haltevorrichtungen (8) an unterschiedlichen Positionen an den Seitenwänden angeordnet sind, derart, dass die Tragefläche (4) so ausgezogen ist, dass sie die Tiefenerstreckung der Kühlvorrichtung (1) teilweise oder ganz abdeckt, und ein Regal (2), das dazu dient, Lebensmittel- und Getränkebehälter von zwei unterschiedlichen Höhen (H1, H2) auf dem fixierten Regal (A) zu lagern, darunter angeordnet ist, wenn die Tragefläche (4) teilweise geöffnet ist.

Revendications

1. Un dispositif de refroidissement (1) comprenant un ou plusieurs étagères (2) pour conserver des objets sur ceux-ci, **caractérisé par** un ou plusieurs logements (3) situés sur l'un de ses murs intérieurs, pour soutenir l'étagère (2) dans la position d'utilisation et la maintenir au niveau souhaité, l'étagère (2) ayant une surface de soutien (4) qui est enroulée dans la position de non utilisation, et déroulée pour former la partie portante de charge de l'étagère (2) dans la position d'utilisation, et un axe auquel la surface de soutien (4) est attachée par une côté pour être roulée dans la position de non utilisation.
2. Un dispositif de refroidissement (1) selon la Revendication 1, **caractérisé par** un boîtier (5) qui loge la surface de soutien (4) roulée dans la position de non utilisation et l'axe (6) autour duquel la surface de soutien (4) est roulée, qui est assise dans les logements (3) pour placer l'étagère (2) dans le dispositif de refroidissement (1).
3. Un dispositif de refroidissement (1) selon la Reven-

dication 1 ou 2, **caractérisé par** une étagère (2) comprenant au moins un dispositif de retenue (7) pour fixer la surface de soutien (4) au(x) mur(s) du dispositif de refroidissement (1) une fois apportée à la position d'utilisation et pour la garder ouverte.

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mettant à des récipients d'aliment et de boisson à deux hauteurs différentes (H1, H1) d'être conservés sur l'étagère fixée (A) de dessous quand la surface de soutien (4) est partiellement ouverte.

4. Un dispositif de refroidissement (1) selon la Revendication 3, **caractérisé par** au moins une butée (8) disposé sur les murs intérieurs, à laquelle le dispositif de retenue (7) situé à l'extrémité de la surface de soutien (4) est fixé. 10
5. Un dispositif de refroidissement (1) selon la Revendication 4, **caractérisé par** une butée (8) sous la forme d'un évidement dans laquelle le dispositif de retenue (7) peut être inséré. 15
6. Un dispositif de refroidissement (1) selon la Revendication 4, **caractérisé par** une butée (8) sous la forme d'une goupille à laquelle le dispositif de retenue (7) peut être fixé. 20
7. Un dispositif de refroidissement (1) selon l'une quelconque des Revendications précédentes, **caractérisé par** une surface de soutien (4) qui est fabriquée d'un matériel élastique pour rouler ou pour supporter une charge, une fois déroulée. 25
8. Un dispositif de refroidissement (1) selon l'une quelconque des Revendications précédentes, **caractérisé par** une surface de soutien (4) qui a une structure perforée. 30
9. Un dispositif de refroidissement (1) selon l'une quelconque des Revendications précédentes, **caractérisé par** une étagère (2) comprenant un biais arrangé dans le boîtier (5), qui est comprimée par le mouvement rotationnel de l'axe (6) lorsqu'elle apporte l'étagère (2) à la position d'utilisation, permettant à la surface de soutien (4) d'être gardée déroulée quand l'étagère (2) est dans la position de non utilisation et permettant à l'étagère (2) de reprendre automatiquement la position de non utilisation, une fois lâchée. 35
40
10. Un dispositif de refroidissement (1) selon l'une quelconque des Revendications de 4 à 9, **caractérisé par** un logement (3) disposé sur un des murs latéraux et au moins une butée (8) sur l'autre. 45
50
11. Un dispositif de refroidissement (1) selon l'une quelconque des Revendications de 4 à 9, **caractérisé par** un logement (3) disposé sur le mur arrière et au moins deux butée (8) disposées à des positions différentes sur les murs latéraux de telle manière que la surface de soutien (4) est déroulée pour recouvrir partiellement ou entièrement la profondeur du dispositif de refroidissement (1) et une étagère (2) per- 55

Figure 1

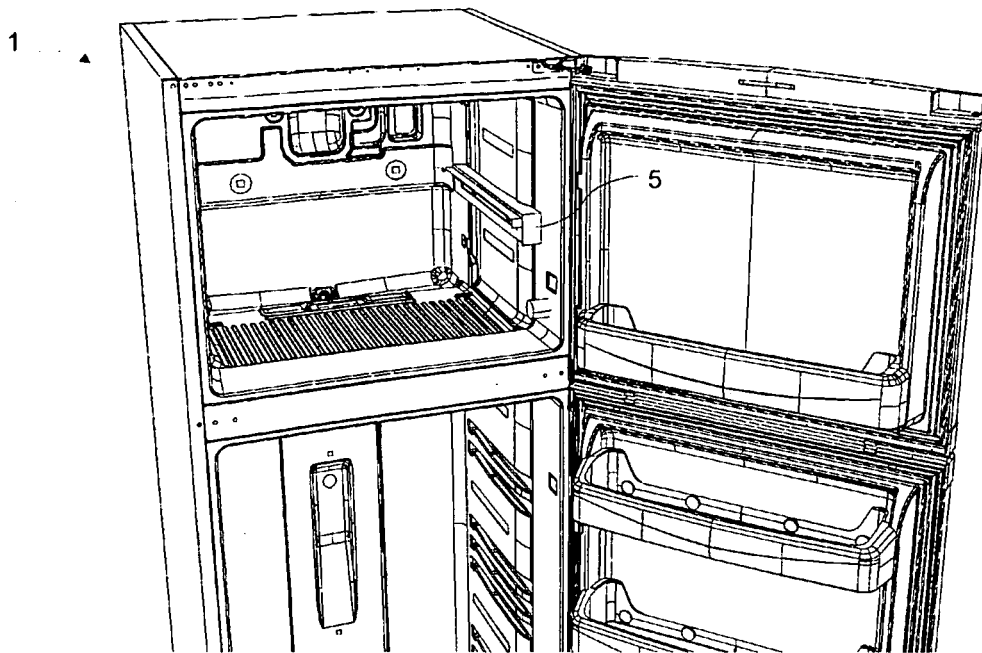


Figure 2

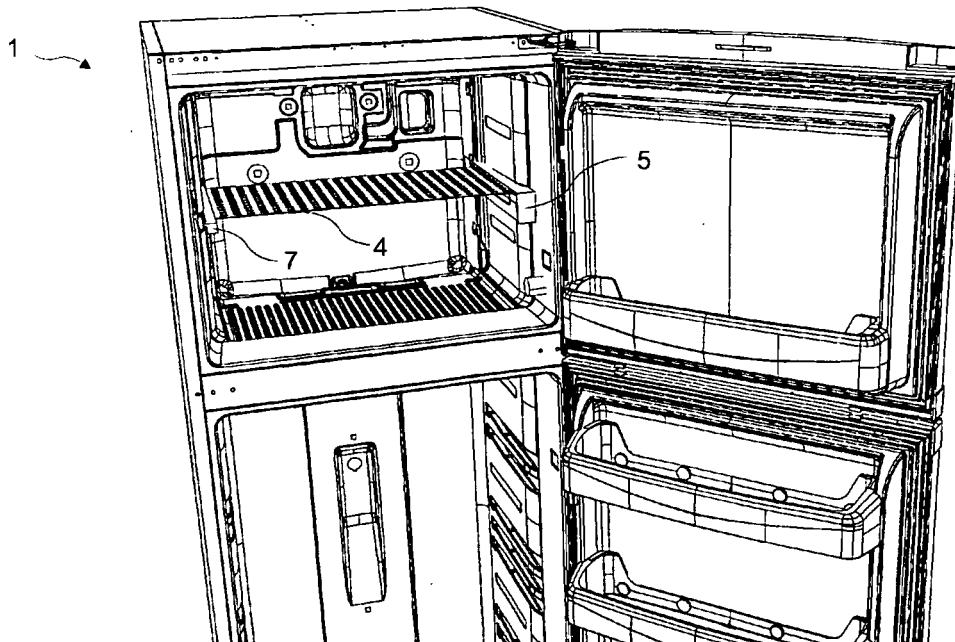


Figure 3

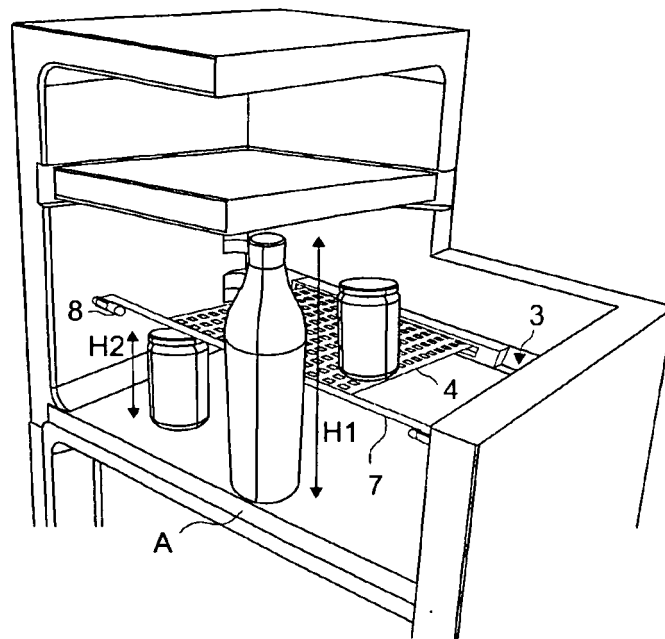


Figure 4

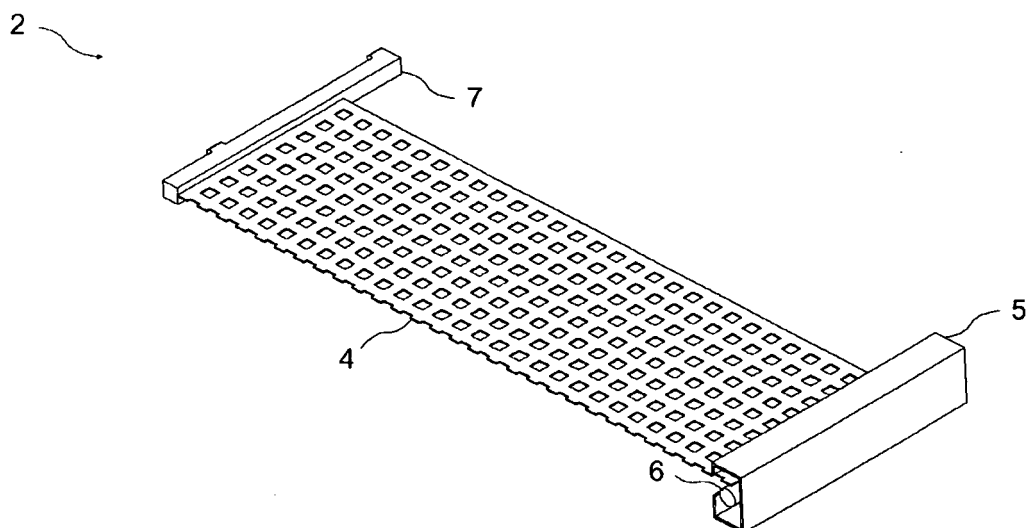


Figure 5

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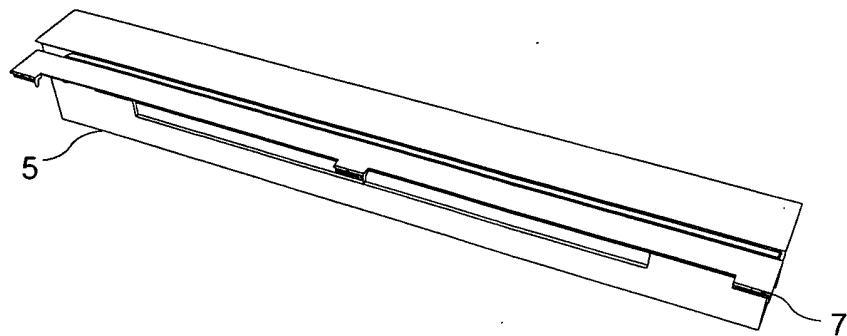
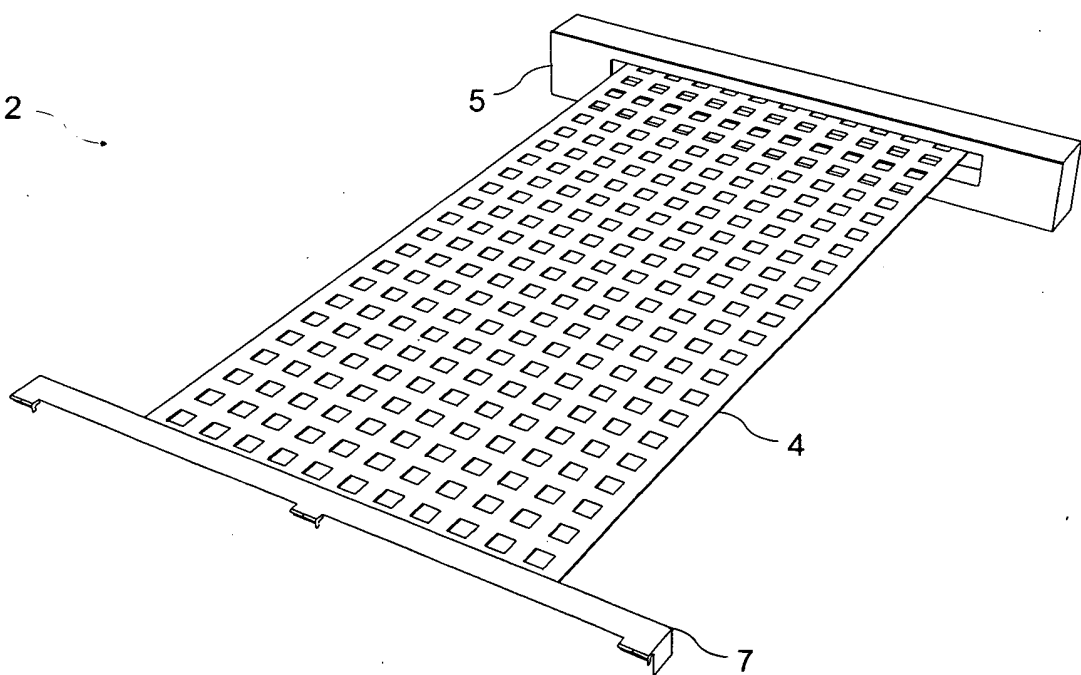


Figure 6

2



REFERENCES CITED IN THE DESCRIPTION

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