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(54) A REFRIGERATOR COMPRISING A DOOR SHELF SEPARATOR

EIN KÜHLGERÄT MIT EINEM TÜRHALTERABSCHEIDER

RÉFRIGÉRATEUR COMPRENANT UN SÉPARATEUR D'ÉTAGÈRE DE PORTE

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(56) References cited:
WO-A1-2016/023091
CN-U- 201 555 417
US-A1- 2015 198 365

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Description

[0001] The present invention relates to a refrigerator comprising a separator that is used on the door shelf.

[0002] Refrigerators comprise shelves attached to the door or the body, whereon food and beverage containers are placed. When placing tall containers onto the shelf, one or more than one shelf above the said shelf is required to be removed or displaced. When placing short containers onto the shelf, a dead volume is created between the said shelf and the shelf thereabove. In the state of the art, foldable or telescopic shelf systems are used in order to create flexible usage volumes that enable the containers with various sizes to be stored. Especially, the foodstuffs, beverages or items with various forms and sizes that are placed onto the shelf may tumble or fall off the shelf while being placed or when the door is being opened or closed after being placed. In the state of the art embodiments, separators are disposed into the door shelf in order to prevent the items that are placed onto the shelf from tumbling or rolling over. When the size of the door shelf is required to be changed, the use of separators gives rise to problems.

[0003] In the Patent Document No. CN101025325, an extendable refrigerator cold storage bottle base is disclosed.

[0004] In the European Patent No. EP1769203 (B1), separators that can be detachably attached to the door shelf used in the refrigerator, that can move by being slid on the opposite sides of the door shelf and that can be fixed at a desired position.

[0005] WO 2016/023091 A1 discloses a fixture in the form of a shelf for mounting to inner surface of a refrigerator door. The shelf has a telescopic structure comprising a base and a platform. The platform can slide with respect to the base, in a direction parallel to the door, enabling an increase or reduction in shelf space.

[0006] US 2015/198365 A1 discloses a refrigerator appliance having a door module assembly comprising a door tray movable relative a mounting bracket thereof. The door tray is movable in a horizontal direction between a retracted position and an extended position.

[0007] The aim of the present invention is the realization of a refrigerator comprising separators suitable for use in door shelves with adjustable article storage capacities.

[0008] The refrigerator realized in order to attain the aim of the present invention is explicated in the claims.

[0009] The door shelf used in the refrigerator of the present invention is composed of two sections, comprising a fixed section adjacent to the inner lining of the door and a movable section that is telescopically attached to the fixed section and that is moved on the fixed section by the user or by means of an adjustment mechanism in a horizontal direction perpendicular or parallel to the inner lining of the door such that the width or the length thereof can be changed. Into the door shelf, a separator is disposed, that divides into two partitions the inner volume thereof wherein the items are loaded. The separator is composed of a rear part with one end being attached to the fixed section of the door shelf and a front part that can be slidably moved on the rear part. When the width or the length of the door shelf is changed, the front part is moved back and forth on the rear part. Thus, the length of the separator is increased/decreased so as to match the dimensions of the shelf.

[0010] The refrigerator realized in order to attain the aim of the present invention is illustrated in the attached figures, where:

Figure 1 - is the schematic view of a door shelf with adjustable width on a refrigerator door and the separator disposed therein.
Figure 2 - is the schematic view of a door shelf with adjustable length on a refrigerator door and the separator disposed therein.
Figure 3 - is the cross-sectional view of the door shelf and the separator therein.
Figure 4 - is the perspective view of a door shelf at the longest state thereof and the separator therein.
Figure 5 - is the perspective view of a door shelf at the widest state thereof and the separator therein.
Figure 6 - is the perspective view of the door shelf and the separator that can be slid to the left or right therein.
Figure 7 - the perspective view of the door shelf and the separator that is hidden on the rear wall thereof.
Figure 8 - is the cross-sectional view of the door shelf and the separator therein in an embodiment of the present invention.
Figure 9 - is the view of the detail D in Figure 8.
Figure 10 - is the exploded view of a refrigerator door, a door shelf and a separator.

[0011] The elements illustrated in the figures are numbered as follows:

1. Door
2. Door shelf
3. Fixed section
4. Movable section
5. Rear part
6. Front part
7. Separator
8. Guide
9. Channel
10. Extension
11. Adjustment mechanism

W: Door shelf width
L: Door shelf length
B1, B2: Partitions separated by the separator on the door shelf

[0012] The refrigerator comprises a body, at least one door (1) that allows access into the body and a door shelf (2) that is disposed on the inner lining of the door (1).

[0013] The door shelf (2) comprises a fixed section (3) adjacent to the inner lining of the door (1) and a movable section (4) that is telescopically attached to the fixed section (3) and that by is moved on the fixed section (3) by the user or by means of an adjustment mechanism (11) in a horizontal direction that is perpendicular or parallel to the inner lining of the door (1) such that the width (W) or the length (L) of the door shelf (2) can be changed.

[0014] The refrigerator of the present invention comprises a separator (7) that divides the inner volume of the door shelf (2) wherein the items are loaded into two partitions (B1, B2), that can be extended/retracted according to the changed width (W) or length (L) of the door shelf (2), and that has a rear part (5) with one end attached to the fixed section (3) and a front part (6) that is attached to the rear part (5) so as to slidably move thereon and that is moved on the rear part (5) back and forth so as to contact the movable section (4) of the door shelf (2) when the position of the movable section (4) is changed (Figure 1, Figure 2).

[0015] The door shelf (2) is composed of two sections, namely the fixed section (3) adjacent to the inner lining of the door (1) and the movable section (4) that can be moved on the fixed section (3) forwards in a direction perpendicular to the inner lining of the door (1) or laterally in a direction parallel to the inner lining of the door (1) and that enables the width (W) or the length (L) of the door shelf (2), thus, the size of the volume inside the door shelf (2) wherein the items are placed to be changed. The separator (7) is disposed into the door shelf (2) and divides the inner volume wherein the items to be cooled/frozen are placed into two partitions (B1, B2). The separator (7) is composed of two parts, namely the rear part (5) attached to the fixed section (3) of the door shelf (2) and the front part (6) that is moved by the user so as to contact the inner surface of the movable section (4) of the door shelf (2). The separator (7) can be extended or shortened according to the changed width (W) or length (L) of the door shelf (2).

[0016] In an embodiment of the present invention, the separator (7) divides the loading volume in the door shelf (2) into two partitions (B1, B2) on the right and on the left in a direction parallel to the inner lining of the door (1). In this embodiment, the separator (7) comprises the rear part (5) attached to the rear wall of the fixed section (3) of the door shelf (2) and the front part (6) that can be moved on the right or the left surface of the rear part (5) facing the inner volume of the door shelf (2) (Figure 1).

[0017] In another embodiment of the present invention, the separator (7) comprises two guides (8) that are fixed to the upper and lower edges of the rear part (5) and that enable the front part (6) to be borne so as to slidably move on the rear part (5). The lengths of the guides (8) are more than the lateral length of the rear part (5) so as to bear the front part (6) pulled forwards away from the rear part (5). Thus, at the widest state of the door shelf (2) and at the maximum length of the separator (7), the front part (6) is partially borne by the guides (8) and the front part (6) is prevented from being detached from the rear part (5) (Figure 3).

[0018] In another embodiment of the present invention, the door shelf (2) comprises two channels (9) that extend along the horizontal upper edge and lower edge of the rear wall of the fixed section (3) and that provides that the separator (7) slides inside the door shelf (2) and that the volumes of the right and left (or front and rear) partitions (B1, B2) are changed according to user preference. In this embodiment, the separator (7) comprises two extensions (10) that extend upwards and downwards from the rear part (5) and that move laterally in the channels (9) (Figure 9).

[0019] In an embodiment of the present invention, when not in use, the separator (7) can be rotated around the vertical axis formed by the extensions (10) inside the channels (9) so as to bear against the rear wall of the door shelf (2) and to be shifted to the storage position. When not in use, the separator (7) can be rotated inside the door shelf (2) and shifted to the storage position and does not occupy space in the door shelf (2) (Figure 7).

[0020] In another embodiment of the present invention, the rear part (5) is in the form of a trapezoid getting narrower towards the front inside the door shelf (2) and is placed without being fitted into the channels (9) when the separator (7) is rotated towards the rear wall of the door shelf (2) and brought to the storage position (Figure 8).

[0021] In another embodiment of the present invention, the separator (7) divides the loading volume in the door shelf (2) into two partitions (B1, B2) in the front and in the back in a direction perpendicular to the inner lining of the door (1) (Figure 2).

[0022] In another embodiment of the present invention, the separator (7) is telescopic and comprises the rear part (5) and the front part (6) that can slide one within the other. In this embodiment, the front part (6) is moved by being slid into the rear part (5) and the length of the separator (7) in the horizontal direction is increased or decreased.

[0023] The separator (7) further comprises holes that provide air circulation between the partitions (B1, B2) that are formed by the separator (7) inside the door shelf (2).

[0024] In the refrigerator of the present invention, the width (W) or the length (L) of the door shelf (2) can be changed according to user preference. The separator (7) dividing the inner volume of the door shelf (2) into partitions (B1, B2) is extended or retracted to fit the changed dimensions of the door shelf (2), thus providing flexible use.

Claims

1. A refrigerator **comprising** a body, at least one door (1) providing access into the body, and a door shelf (2) having a fixed section (3) adjacent to an inner lining of the door (1) and a movable section (4) that is telescopically attached to the fixed section (3) and

that is moved on the fixed section (3) by a user or by means of an adjustment mechanism (11) in a horizontal direction that is perpendicular or parallel to the inner lining of the door (1) such that the width (W) or the length (L) of the door shelf (2) can be changed, **characterized by** a separator (7) that divides an inner volume of the door shelf (2) into two partitions (B1, B2), that can be extended/retracted according to the changed width (W) or length (L) of the door shelf (2), and that has a rear part (5) with one end attached to the fixed section (3) and a front part (6) that is attached to the rear part (5) so as to slidably move thereon.

2. A refrigerator as in Claim 1, **characterized by** the separator (7) that divides the inner volume in the door shelf (2) into the two partitions (B1, B2) that are on the right and on the left in a direction parallel to the inner lining of the door (1).

3. A refrigerator as in Claim 2, **characterized by** the separator (7) comprising the rear part (5) attached to the rear wall of the fixed section (3) of the door shelf (2) and the front part (6) that can be moved on a right or a left surface of the rear part (5) facing the interior of the door shelf (2).

4. A refrigerator as in Claim 3, **characterized by** the separator (7) comprising two guides (8) that are fixed to upper and lower edges of the rear part (5) and that bear the front part (6) so as to slidably move on the rear part (5).

5. A refrigerator as in Claim 4, **characterized by** the separator (7) having the guides (8) that are longer than the length of the rear part (5) in the horizontal direction.

6. A refrigerator as in Claim 1, **characterized by** the door shelf (2) comprising two channels (9) that extend along a horizontal upper edge and a lower edge of the rear wall of the fixed section (3) and that provides that the separator (7) slides inside door shelf (2) and that the volumes of the partitions (B1, B2) can be changed according to user preference.

7. A refrigerator as in Claim 6, **characterized by** the separator (7) comprising two extensions (10) that extend upwards and downwards from the rear part (5) and that move inside the channels (9) in the horizontal direction.

8. A refrigerator as in Claim 1, **characterized by** the separator (7) that, when not in use, can be rotated around the vertical axis formed by the extensions (10) inside the channels (9) so as to bear against the rear wall of the door shelf (2) and to be shifted to the storage position.

9. A refrigerator as in Claim 8, **characterized by** the separator (7) comprising the rear part (5) in the form of a trapezoid getting narrower towards the front inside the door shelf (2).

10. A refrigerator as in Claim 1, **characterized by** the separator (7) that divides the inner volume in the door shelf (2) into two partitions (B1, B2) that are in the front and in the back in a direction perpendicular to the inner lining of the door (1).

11. A refrigerator as in Claim 1, **characterized by** the separator (7) that is telescopic, comprising the rear part (5) and the front part (6) that can slide one within the other.

12. A refrigerator as in any one of the above claims, **characterized by** the separator (7) comprising holes that enables the air circulation between the partitions (B1, B2) that are formed by the separator (7) inside the door shelf (2).

Patentansprüche

1. Ein Kühlschrank **umfasst** einen Körper, mindestens eine Tür (1), die den Zugang zum Körper ermöglicht; ein Türregal (2) mit einem feststehenden Abschnitt (3) angrenzend an eine Innenverkleidung der Tür (1) und einem beweglichen Abschnitt (4), der teleskopartig an dem feststehenden Abschnitt (3) befestigt ist und auf dem feststehenden Profil (3) durch einen Benutzer oder mithilfe eines Verstellmechanismus (11) in horizontaler Richtung senkrecht oder parallel zur Innenverkleidung der Tür (1) so verwendet wird, dass die Breite (W) bzw. die Länge (L) von die Türablage (2) gewechselt werden kann, **gekennzeichnet ist er** durch eine Trennwand (7), die ein Innenvolumen des Türregals (2) in zwei Trennwände (B1, B2) unterteilt, die entsprechend der geänderten Breite (W) oder Länge (L) der Tür aus- und eingefahren werden können und dass der Türregal (2) mit einen rückwärtigen Teil (5) mit einem Ende, der an dem feststehenden Abschnitt (3) befestigt ist, und einen vorderen Teil (6) aufweist, der gleitend an dem rückwärtigen Teil (5) befestigt ist.

2. Ein Kühlschrank, wie in Anspruch 1 aufgeführt, **ist dadurch gekennzeichnet, dass** die Trennwand (7) das Innenvolumen im Türregal (2) in die beiden Trennwände (B1, B2) rechts und links in einer Richtung parallel zur Innenverkleidung der Tür (1) unterteilt.

3. Ein Kühlschrank, wie in Anspruch 2 aufgeführt, **ist dadurch gekennzeichnet, dass** die Trennwand (7) aus dem an der Rückwand des feststehenden Profils (3) des Türregals (2) befestigten Rückteil (5) und

dem auf einer rechten oder linken Seite verschiebbaren Vorderteil (6) besteht wobei der hintere Teil (5) dem Inneren des Türregals (2) zugewandt ist.

4. Ein Kühlschrank, wie in Anspruch 3 aufgeführt, **ist dadurch gekennzeichnet, dass** die Trennwand (7) zwei Führungen (8) umfasst, die an Ober- und Unterkanten des hinteren Teils (5) befestigt sind und die den vorderen Teil (6) gleitend auf dem hinteren Teil (5) tragen.

5. Ein Kühlschrank, wie in Anspruch 4 aufgeführt, **ist dadurch gekennzeichnet, dass** die Trennwand (7) Führungen (8) aufweist, die in horizontaler Richtung länger als die Länge des hinteren Teils (5) sind.

6. Ein Kühlschrank, wie in Anspruch 1 aufgeführt, **ist dadurch gekennzeichnet, dass** die Türregale (2) zwei Kanäle (9) umfassen, die sich entlang einer horizontalen Oberkante und einer Unterkante der Rückwand des festen Profils (3) erstrecken und dafür sorgen, dass die Trennwand (7) innerhalb der Türablage (2) gleitet und dass das Volum der Partitionen (B1, B2) je nach Benutzereinstellung geändert werden können.

7. Ein Kühlschrank, wie in Anspruch 6 aufgeführt, **ist dadurch gekennzeichnet, dass** die Trennwand (7), zwei Verlängerungen (10) umfasst, die sich vom hinteren Teil (5) nach oben und unten erstrecken und sich in horizontaler Richtung innerhalb der Kanäle (9) bewegen.

8. Ein Kühlschrank, wie in Anspruch 1 aufgeführt, **ist dadurch gekennzeichnet, dass** die Trennwand (7) bei Nichtgebrauch um die durch die Fortsätze (10) innerhalb der Kanäle (9) gebildete vertikale Achse drehbar ist, um an der Rückwand des Türregals (2) anzuliegen und in die Lagerposition verschoben zu werden.

9. Ein Kühlschrank, wie in Anspruch 8 aufgeführt, **ist dadurch gekennzeichnet, dass** die Trennwand (7) den hinteren Teil (5) in Form eines Trapezes umfasst, der sich nach vorne innerhalb des Türregals (2) verschmälert.

10. Ein Kühlschrank, wie in Anspruch 1 aufgeführt, **ist dadurch gekennzeichnet, dass** die Trennwand (7), die das Innenvolumen im Türregal (2) in zwei Trennwände (B1, B2) teilt, die vorne und hinten in einer Richtung senkrecht zur Innenverkleidung der Tür (1) liegen.

11. Ein Kühlschrank, wie in Anspruch 1 aufgeführt, **ist dadurch gekennzeichnet, dass** die Trennwand (7) teleskopisch aufgebaut ist und bestehend aus dem hinteren Teil (5) und dem vorderen Teil (6), die ineinander verschiebbar sind.

12. Ein Kühlschrank, wie in einem der vorherigen Ansprüchen aufgeführt, **ist dadurch gekennzeichnet, dass** die Trennwand (7) Löcher umfasst, die die Luftzirkulation zwischen den Trennwänden (B1, B2) ermöglichen, die durch den Separator (7) innerhalb des Türregals (2) gebildet werden.

Revendications

1. Un réfrigérateur **comprenant** un corps, au moins une porte (1) fournissant un accès dans le corps, et une étagère de porte (2) ayant une section fixe (3) adjacente à un revêtement intérieur de la porte (1) et une section mobile (4) qui est fixée de manière télescopique à la section fixe (3) et qui est déplacée sur la section fixe (3) par un utilisateur ou au moyen d'un mécanisme de réglage (11) dans une direction horizontale qui est perpendiculaire ou parallèle au revêtement intérieur de la porte (1) de sorte que la largeur (W) ou la longueur (L) de l'étagère de porte (2) peut être modifiée, est **caractérisé en ce qu'**il comprend un séparateur (7) qui divise un volume intérieur de la tablette de porte (2) en deux partitions (B1, B2), qui peut être étendu/rétracté selon la largeur (W) ou la longueur (L) modifiée de la tablette de porte (2), et qui a une partie arrière (5) avec une extrémité fixée à la section fixe (3) et une partie avant (6) qui est fixée à la partie arrière (5) de manière à se déplacer de manière coulissante sur celle-ci.

2. Un réfrigérateur selon la déclaration 1, **est caractérisé en ce que** le séparateur (7) divise le volume intérieur dans l'étagère de porte (2) en deux partitions (B1, B2) qui sont à droite et à gauche dans une direction parallèle au revêtement intérieur de la porte (1).

3. Un réfrigérateur selon la déclaration 2, **est caractérisé en ce que** le séparateur (7) comprend la partie arrière (5) fixée à la paroi arrière de la section fixe (3) de la tablette de porte (2) et la partie avant (6) qui peut être déplacée sur une surface droite ou gauche de la partie arrière (5) faisant face à l'intérieur de la tablette de porte (2).

4. Un réfrigérateur selon la déclaration 3, **est caractérisé en ce que** le séparateur (7) comprend deux guides (8) qui sont fixés aux bords supérieur et inférieur de la partie arrière (5) et qui portent la partie avant (6) de manière à se déplacer de façon coulissante sur la partie arrière (5).

5. Un réfrigérateur selon la déclaration 4, **est caractérisé en ce que** le séparateur (7) a des guides (8) qui sont plus longs que la longueur de la partie arrière

(5) dans la direction horizontale.

6. Un réfrigérateur selon la déclaration 1, **est caractérisé en ce que** l'étagère de porte (2) comprend deux canaux (9) qui s'étendent le long d'un bord supérieur horizontal et d'un bord inférieur de la paroi arrière de la section fixe (3) et qui permettent au séparateur (7) de glisser à l'intérieur de l'étagère de porte (2) et aux volumes des cloisons (B1, B2) d'être modifiés selon les préférences de l'utilisateur.

7. Un réfrigérateur selon la déclaration 6, **est caractérisé en ce que** le séparateur (7) comprend deux extensions (10) qui s'étendent vers le haut et vers le bas depuis la partie arrière (5) et qui se déplacent à l'intérieur des canaux (9) dans la direction horizontale.

8. Un réfrigérateur selon la déclaration 1, **est caractérisé en ce que** le séparateur (7), lorsqu'il n'est pas utilisé, peut être tourné autour de l'axe vertical formé par les extensions (10) à l'intérieur des canaux (9) de façon à s'appuyer contre la paroi arrière de la tablette de porte (2) et à être déplacé vers la position de stockage.

9. Un réfrigérateur selon la déclaration 8, **est caractérisé en ce que** le séparateur (7) comprend la partie arrière (5) sous la forme d'un trapèze se rétrécissant vers l'avant à l'intérieur de l'étagère de porte (2).

10. Un réfrigérateur selon la déclaration 1, **est caractérisé en ce que** le séparateur (7) divise le volume intérieur dans l'étagère de porte (2) en deux partitions (B1, B2) qui sont à l'avant et à l'arrière dans une direction perpendiculaire au revêtement intérieur de la porte (1).

11. Un réfrigérateur selon la déclaration 1, **est caractérisé en ce que** le séparateur (7) est télescopique, comprenant la partie arrière (5) et la partie avant (6) qui peuvent glisser l'une dans l'autre.

12. Un réfrigérateur selon l'une quelconque des déclarations précédentes, **est caractérisé en ce que** le séparateur (7) comprend des trous qui permettent la circulation de l'air entre les cloisons (B1, B2) qui sont formées par le séparateur (7) à l'intérieur de l'étagère de porte (2).

Figure 1

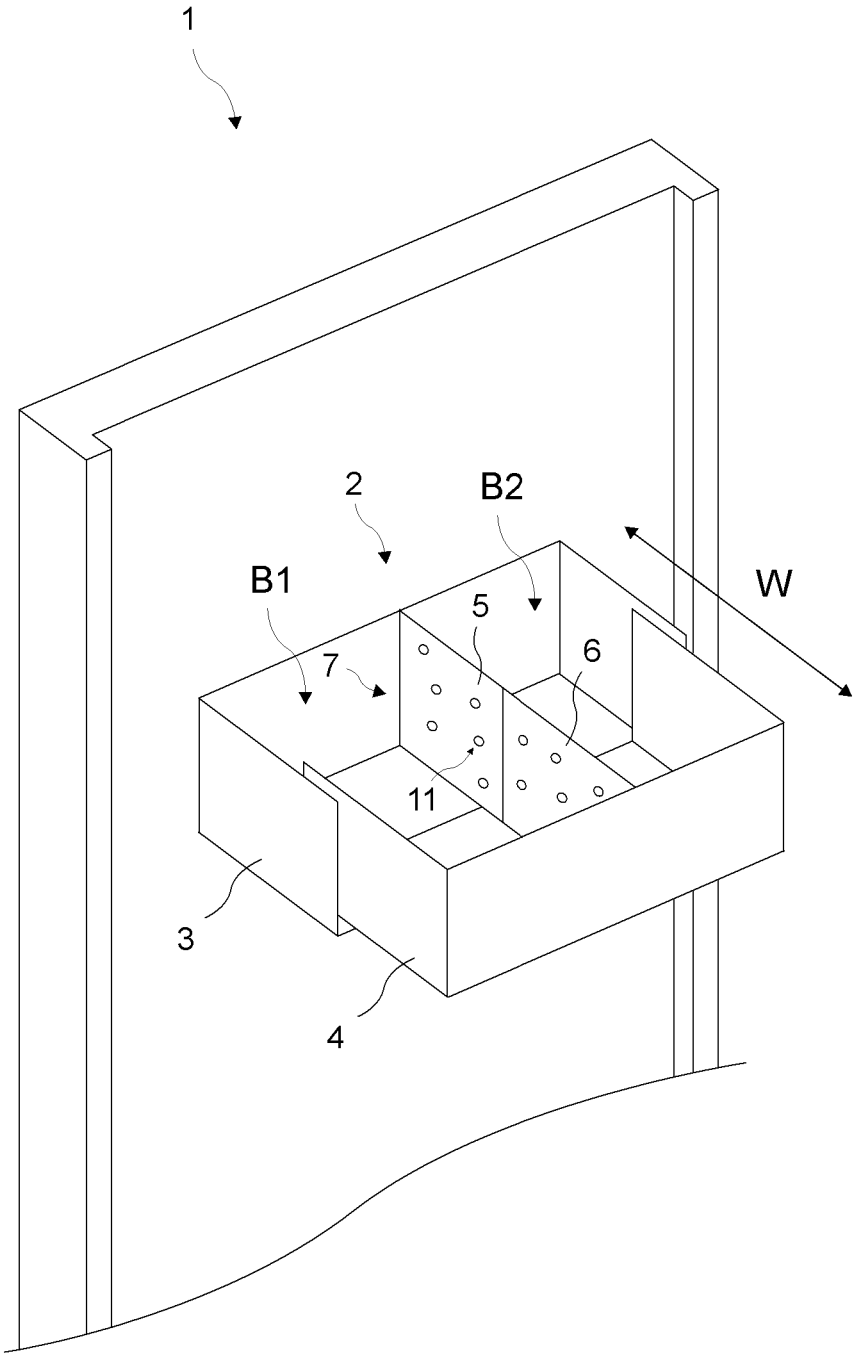


Figure 2

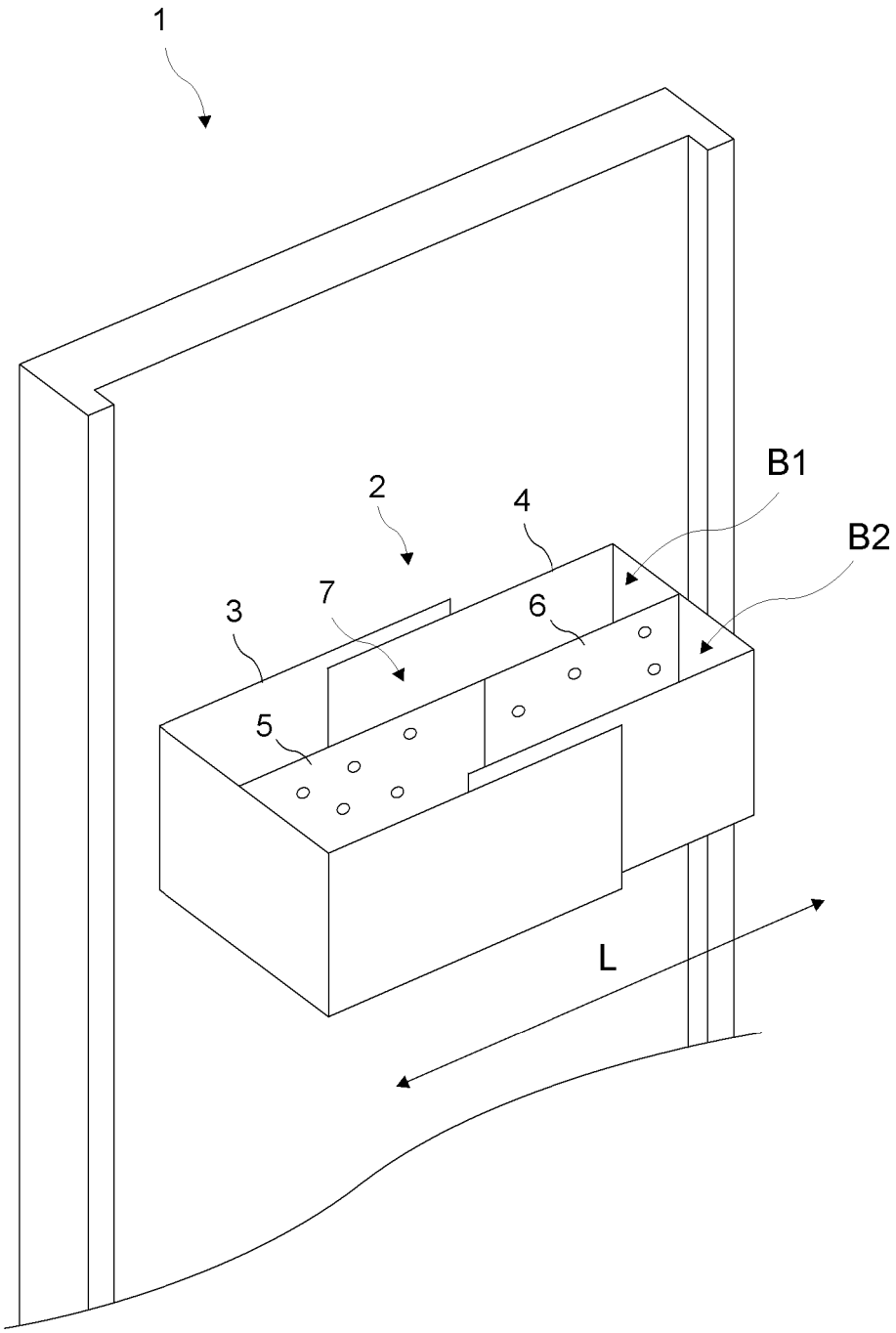


Figure 3

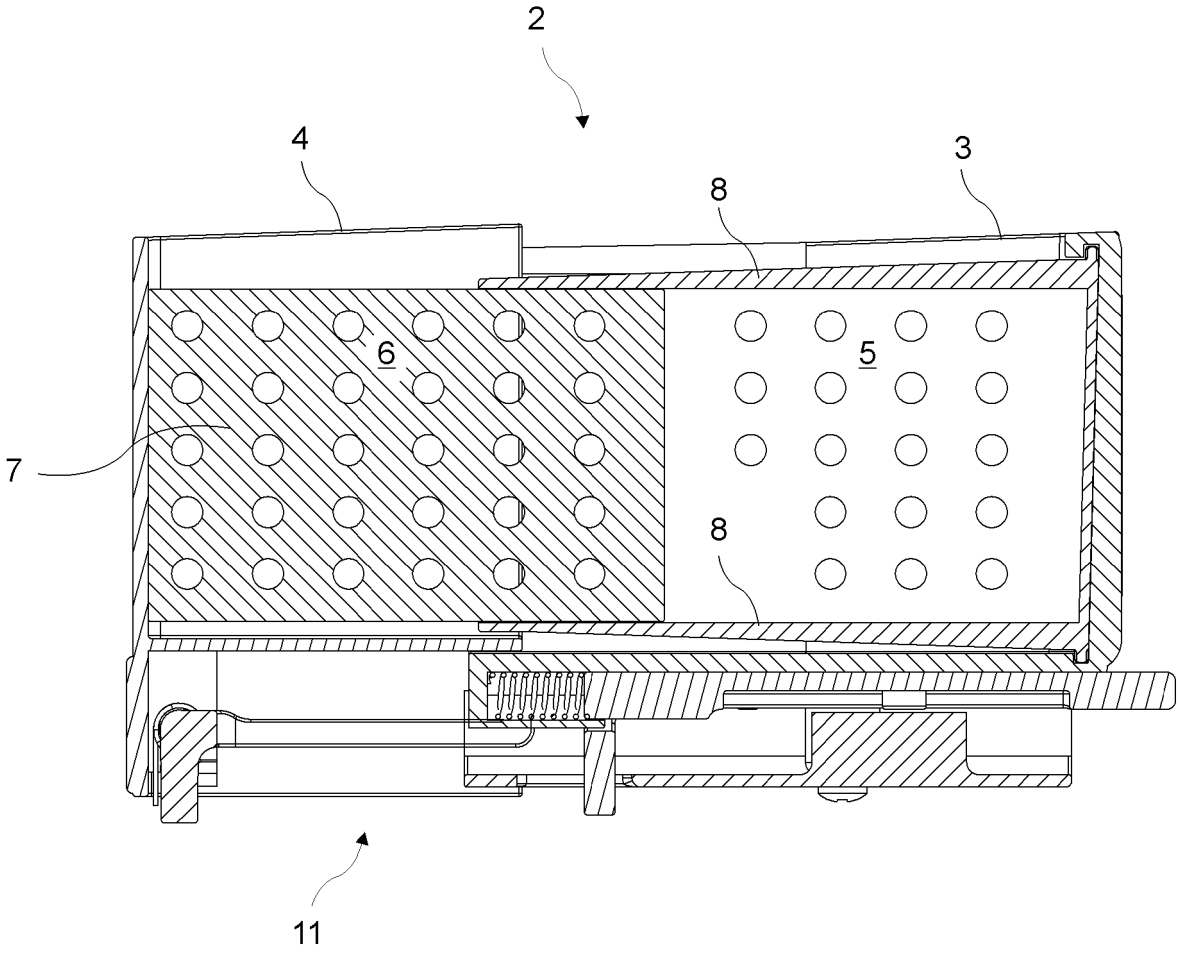


Figure 4

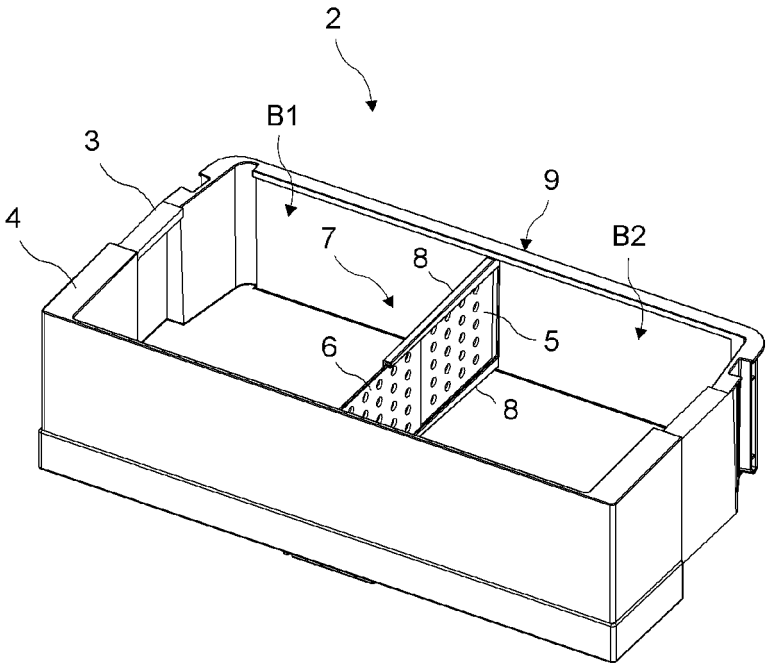


Figure 5

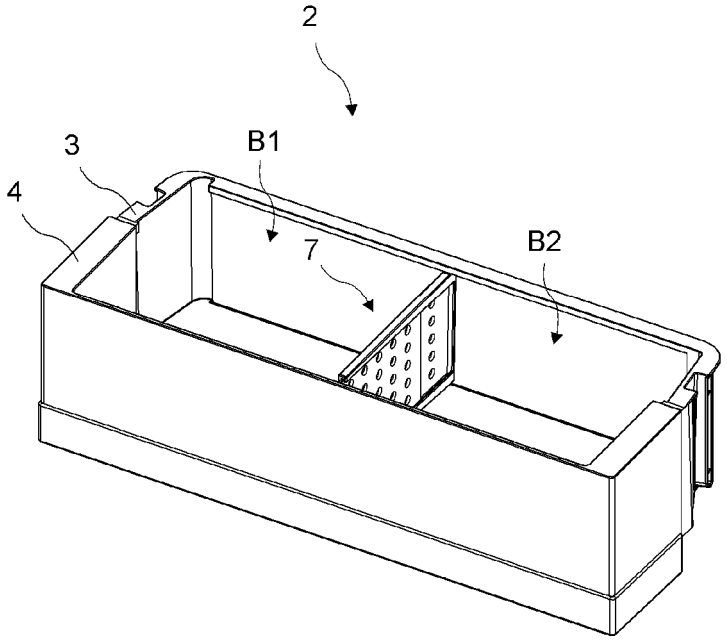


Figure 6

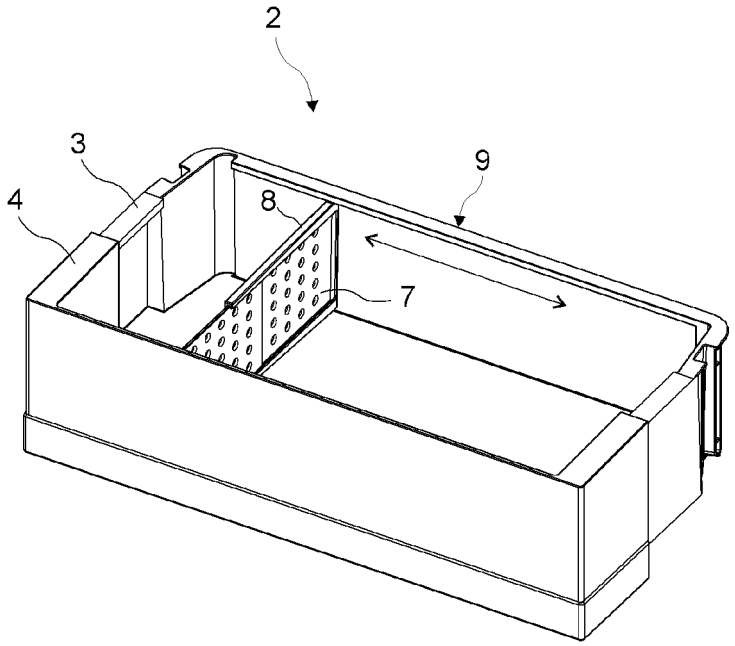


Figure 7

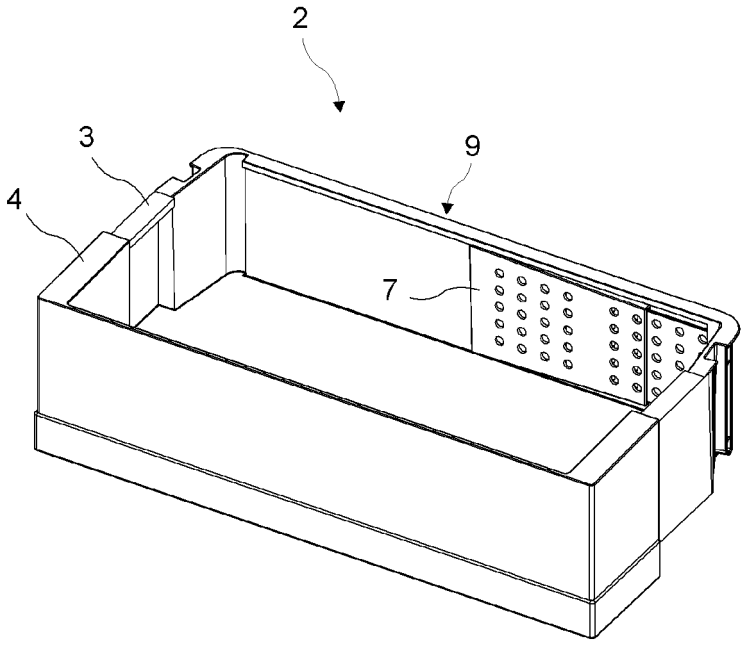


Figure 8

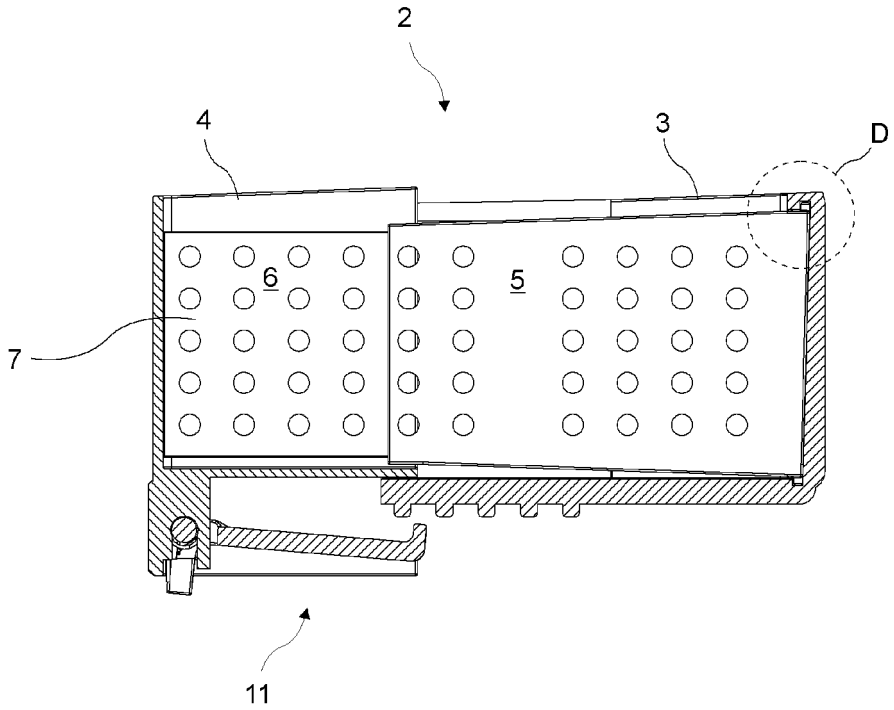


Figure 9

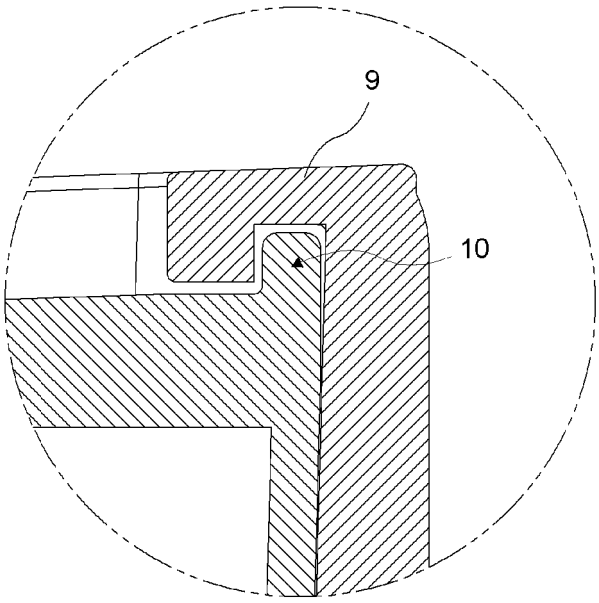
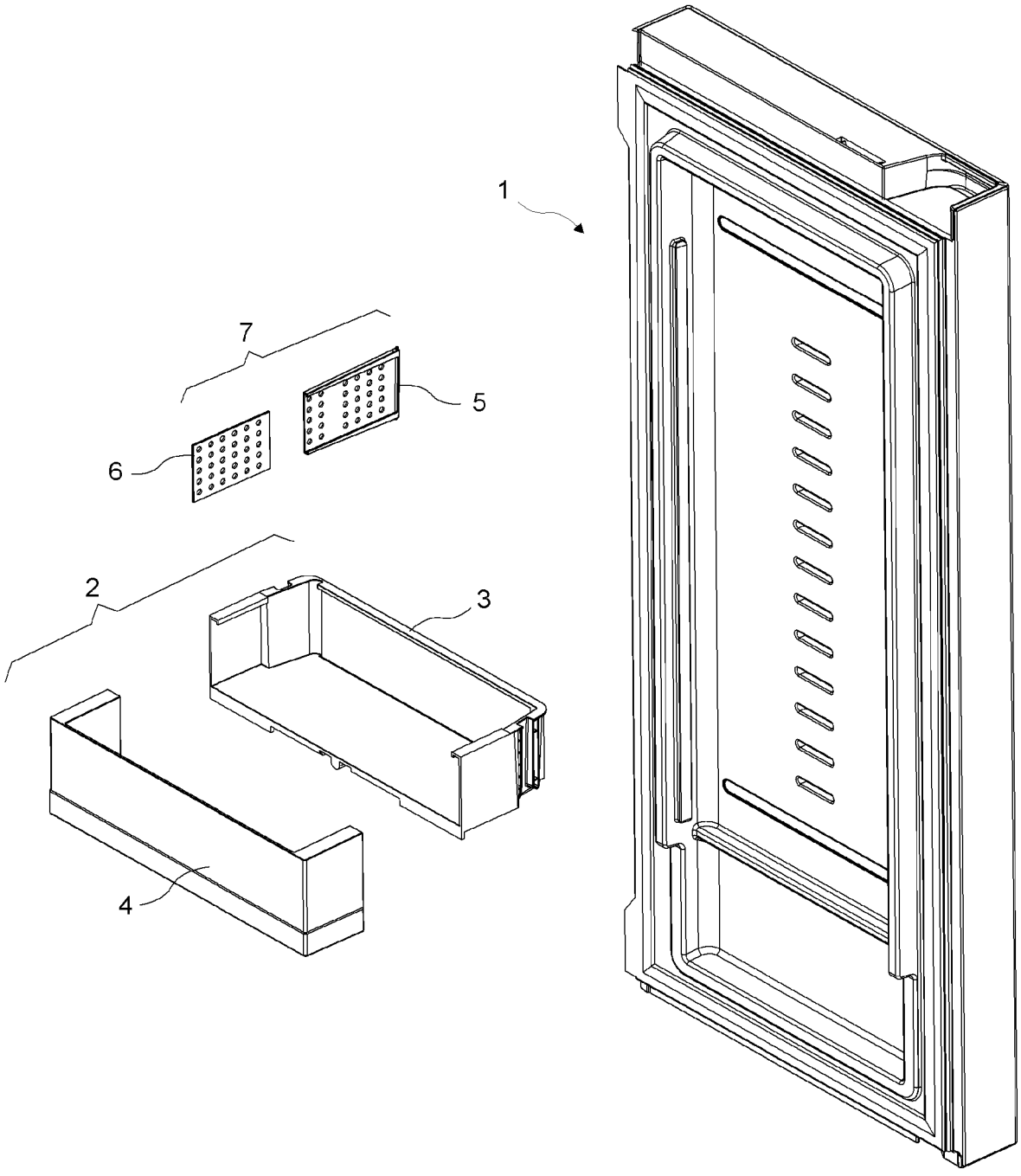


Figure 10



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- CN 101025325 **[0003]**
- EP 1769203 A **[0004]**
- WO 2016023091 A1 **[0005]**
- US 2015198365 A1 **[0006]**