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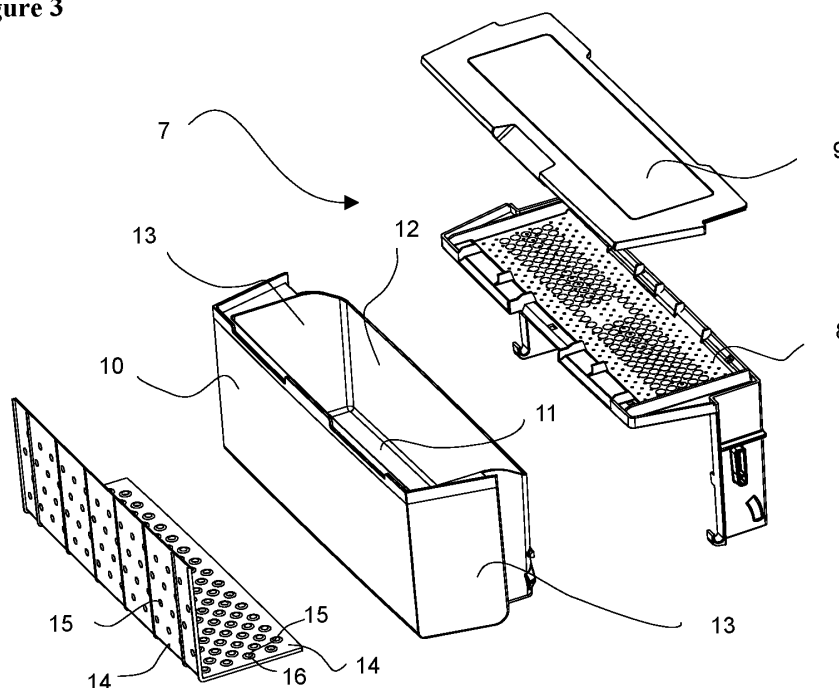
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(54) **A REFRIGERATOR COMPRISING A RECEPTACLE HAVING A MOISTURE SCREEN**

(57) The present invention relates to a refrigerator (1) comprising a body (2); a door (3) which provides access into the body (2); and a receptacle (7) which is suitable for vegetables and fruits therein and which has a perforated cover (8) for discharging the moisture therein into the body (2), a lid (9) which is placed on the perforated cover (8), a base (11), a front wall (10), side walls (13) and a rear wall (12), wherein the receptacle (7) is, when

the door (3) is closed, seated into a door pocket (4) formed on the side of the door (3) facing the body (2) and having a first cavity (5) and a second cavity (6), and has a moisture screen (14) having a plurality of holes (15) and positioned so as to contact at least one of the base (11), the front wall (10), the side walls (13) and the rear wall (12) such that the vegetables and fruits do not come into contact with moisture.

Figure 3



Description

[0001] The present invention relates to a refrigerator wherein moisture and sweating control is performed in a crisper which is disposed on the door.

[0002] The amount of water that vegetables and fruits contain in ideal storage conditions varies according to various criteria. Therefore, each vegetable or fruit cannot be kept fresh for longer when stored in the refrigerator at +4°C. Therefore, consumers do not prefer to store tropical fruits/vegetables such as avocados and bananas in the refrigerator, and they keep such fruits/vegetables at room temperature. However, foodstuffs start to deteriorate because they ripen quickly in this manner. A compartment warmer than +4°C is needed to keep vegetables and fruits which prefer hot climate and are sensitive cold like tomatoes, cucumbers, bananas, avocados, eggplants, zucchini and peppers fresh for a longer period of time. In some state of the art refrigerators, crispers are used where a temperature of +8 °C is provided by means of a heater. Moreover, in the state of the art, there are embodiments where receptacles placed in the door, which have a relatively higher temperature than the body temperature, are used as crisper. However, in such embodiments, various problems arise such as controlling the internal temperature of the refrigerator and ensuring the insulation of the compartment. For example, in a crisper comprising a heater, the heat effect created by the heater should not spread into the body and cause other foodstuffs to deteriorate. Moreover, it is known that the problem of moisture and sweating arises in crispers in the form of a receptacle placed on the door without any heater due to the failure to effectively discharge the cold air coming from the body from the compartment.

[0003] In the fresh food storage receptacle positioned on the door shelf, the volumes on the refrigerator door shelves, the position of the crisper on the door shelf, the shelf distances and the shelf arrangements are very important in the design of the receptacle to provide moisture and temperature control.

[0004] When the cold air coming from the lid of the fresh food storage receptacles placed at the door collides directly especially the air on the front surface and base of the receptacle, condensation is observed on the surfaces of the receptacle since the foodstuffs stored in the receptacle continue their metabolic activities during the storage process. Moreover, the problem of sweating is also caused by the receptacle which is designed to be deep and narrow due to the placement thereof on the door. Since moisture cannot easily leave the receptacle, sweating is observed especially on the cold front wall and base. Intense sweat which directly comes into contact with foodstuffs adversely affects the quality parameters of foodstuffs which are sensitive to cold. Therefore, the direct contact of the foodstuffs with the front wall and base on the inner surface of the receptacle causes them to complete their economic life early and leads to food wastage.

[0005] In the state of the Korean Utility Model Document No. KR19980057503U, a crisper is disclosed, which is provided on the door and which is received by a housing provided in the body when the door is closed.

[0006] The aim of the present invention is the realization of a refrigerator comprising a receptacle which can be placed on the door which allows the storage of vegetables and fruits requiring a temperature higher than +4°C to keep fresh and wherein moisture/sweating can be controlled.

[0007] Another aim of the present invention is to keep tropical vegetables and fruits such as bananas and avocados fresh for a longer period of time in the refrigerator.

[0008] The refrigerator of the present invention comprises a door pocket region where the insulation at the inner lining of the door is thinned by 30 mm on average. The door pocket comprises a first cavity and a second cavity. In the refrigerator of the present invention, a receptacle is positioned in the door pocket. Thus, the temperature of the receptacle is increased with respect to the temperature of the body without using any heater, etc. For example, while the temperature of the body is +4 °C, the temperature of the receptacle is increased up to 7-8 °C due to the arrangement.

[0009] The receptacle has a depth and width suitable for placing fruits and vegetables therein. The receptacle comprises a base, and side walls, a front wall and a rear wall which all surround the base. The receptacle comprises a perforated cover which is placed thereon. Thus, the cold air coming from the body is enabled to be discharged after sweeping the inside of the receptacle. A lid is placed onto the perforated cover.

[0010] In an embodiment of the present invention, the receptacle has a double-walled structure where the front wall and the base are composed of a first plate and a second plate. In an embodiment of the present invention, an insulation material is disposed between the first plate and the second plate. Thus, the insulation in the receptacle is improved. Designing only the front wall and the base with double walls provides that the receptacle is attached to the door more easily and the thickness thereof does not increase towards the body.

[0011] In another preferred embodiments of the present invention, the front wall, the side walls, the base and the rear wall of the receptacle can be double-walled with the insulation material disposed between the first plate and the second plate.

[0012] In the refrigerator of the present invention, the receptacle comprises a moisture screen. The moisture screen is a plate-shaped structure in the receptacle, which at least bears against the base, the front wall, the side walls or the rear wall, and which comprises a plurality of holes allowing the water caused by the condensed steam caused by the difference between the body temperature and the receptacle temperature, known as sweating, to flow.

[0013] In an embodiment of the present invention, the moisture screen has single-piece L form, positioned to-

gether on the front wall and the base. Thus, the water which may form on the front wall and the base, which are the surfaces that vegetables and fruits come into contact with the most, is prevented from coming into contact with the vegetables and fruits, eliminating the risk of spoilage.

[0014] The moisture screen comprises embossments which surround the holes. Thus, the vegetables and fruits are enabled to be placed higher than the holes and their contact with the moisture screen is reduced. Consequently, the vegetables and fruits are prevented from coming into contact with moisture during the flow of water and spoilage is prevented.

[0015] The embossments are in the form of elevations which completely surround the circle formed by the hole.

[0016] In an embodiment of the present invention, said elevations can be manufactured from a flexible material such as rubber and comprises at least one claw to be attached to and detached from the moisture screen. In this embodiment, the moisture screen comprises at least one housing which is disposed around the holes and which is suitable for engaging with the claws at the lower side of the embossment. Thus, an easy-to-clean moisture screen is obtained.

[0017] By means of the present invention, a refrigerator is realized, comprising a door having a receptacle which has an inner temperature increased with respect to the temperature of the body without using a heater, which is controlled in terms of moisture and sweating and which is suitable for placing vegetables and fruits that can be stored for a long time at temperatures higher than +4 °C.

[0018] The model embodiments related to the refrigerator realized in order to attain the aim of the present invention are shown in the attached figures, where:

Figure 1 - is the front view of the refrigerator of the present invention in an embodiment.

Figure 2 - is the sideways view of the cross-section A-A in Figure 1.

Figure 3 - is the exploded view of the receptacle in an embodiment in the refrigerator of the present invention.

Figure 4 - is the detailed view of the B region in Figure 2.

[0019] The elements illustrated in the figures are numbered as follows:

1. Refrigerator
2. Body
3. Door
4. Door pocket

5. First cavity

6. Second cavity

5 7. Receptacle

8. Perforated cover

10 9. Lid

10. Front wall

11. Base

15 12. Rear wall

13. Side wall

20 14. Moisture screen

15. Hole

16. Embossment

25 17. First plate

18. Second plate

[0020] The refrigerator (1) comprises a body (2); a door (3) which provides access into the body (2); and a receptacle (7) which is suitable for vegetables and fruits therein and which has a perforated cover (8) for discharging the moisture therein into the body (2), a lid (9) which is placed on the perforated cover (8), a base (11), a front wall (10), side walls (13) and a rear wall (12).

[0021] The refrigerator (1) of the present invention comprises the receptacle (7) which is, when the door (3) is closed, seated into a door pocket (4) formed on the side of the door (3) facing the body (2) and having a first cavity (5) and a second cavity (6), and which has a moisture screen (14) having a plurality of holes (15) and positioned so as to contact at least one of the base (11), the front wall (10), the side walls (13) and the rear wall (12) such that the vegetables and fruits do not come into contact with moisture.

[0022] In the refrigerator (1) of the present invention, a door pocket (4) is formed on the inner lining of the door (3). Thus, the temperature inside the receptacle (7) on the door (3) is increased without using any member such as heater, etc. The receptacle (7) is suitable for placing tropical fruits and vegetables such as bananas and avocados, suitable for storage at temperatures higher than +4 °C. Due to the air flow between said high-temperature receptacle (7) and the body (2), the sweating problem occurring in the receptacle (7) is solved by means of the moisture screen (14). The moisture screen (14) is a plate-shaped structure having a plurality of holes (15) thereon. The moisture screen (14) can be placed in the receptacle

(7) so as to contact at least one of the base (11), the front wall (11), the side walls (13) and the rear wall (12) which all together form the receptacle (7). Thus, the fruits and vegetables are prevented from coming into contact with the moisture condensed in the receptacle (7) and from getting spoiled.

[0023] In an embodiment of the present invention, the refrigerator (1) comprises the receptacle (7) having a moisture screen (14) having embossments (16) in the form of elevations surrounding each hole (15). In this embodiment, the vegetables and fruits do not come into contact with the holes (15) and the water flowing through the holes (15) and are positioned higher than the moisture screen (14). Thus, the vegetables and fruits can be stored in a healthy manner for a longer period of time.

[0024] In an embodiment of the present invention, the refrigerator (1) comprises a receptacle (7) having the L-shaped moisture screen (14) which is placed together on the base (11) and the front wall (10) so as to completely cover the base (11) and the front wall (10).

[0025] In an embodiment of the present invention, the refrigerator (1) comprises the receptacle (7) having a moisture screen (14) manufactured from a transparent plastic material. Thus, the user is enabled to easily see the inside of the receptacle (7).

[0026] In an embodiment of the present invention, the refrigerator (1) comprises the moisture screen (14) having at least one claw which is provided on the side of the embossment (16) in contact with the moisture screen (14) and which enables the embossment (16) to be attached to and detached from around the holes (15) in the moisture screen (14), and at least one housing which is provided around the holes (15) and which is suitable for engaging with the claw. Thus, the moisture screen (14) and the foreign materials such as dust, dirt etc. entering between the embossment (16) and the holes (15) are enabled to be easily cleaned.

[0027] In an embodiment of the present invention, the refrigerator (1) comprises the moisture screen (14) having the embossment (16) manufactured from an elastic material such as rubber, suitable for contact with food.

[0028] In an embodiment of the present invention, the refrigerator (1) comprises the receptacle (7) having the front wall (10) composed of a first plate (17) and a second plate (18), the base (11) composed of the first plate (17) and the second plate (18), and an insulation material disposed between the first plate (17) and the second plate (18). Thus, it becomes easier to maintain the temperature inside the receptacle (7).

[0029] In an embodiment of the present invention, the refrigerator (1) comprises the receptacle (7) having an insulation material such as air, argon gas, styrofoam, and polyurethane which increases insulation.

Claims

1. A refrigerator (1) **comprising** a body (2); a door (3)

which provides access into the body (2); and a receptacle (7) which is suitable for vegetables and fruits therein and which has a perforated cover (8) for discharging the moisture therein into the body (2), a lid (9) which is placed on the perforated cover (8), a base (11), a front wall (10), side walls (13) and a rear wall (12), **characterized by** the receptacle (7) which is, when the door (3) is closed, seated into a door pocket (4) formed on the side of the door (3) facing the body (2) and having a first cavity (5) and a second cavity (6), and which has a moisture screen (14) having a plurality of holes (15) and positioned so as to contact at least one of the base (11), the front wall (10), the side walls (13) and the rear wall (12) such that the vegetables and fruits do not come into contact with moisture.

2. A refrigerator (1) as in Claim 1, **characterized by** the receptacle (7) having a moisture screen (14) having embossments (16) in the form of elevations surrounding each hole (15).

3. A refrigerator (1) as in Claim 1 or 2, **characterized by** a receptacle (7) having the L-shaped moisture screen (14) which is placed together on the base (11) and the front wall (10) so as to completely cover the base (11) and the front wall (10).

4. A refrigerator (1) as in any one of Claims 1 to 3, **characterized by** the receptacle (7) having a moisture screen (14) manufactured from a transparent plastic material.

5. A refrigerator (1) as in any one of Claims 2 to 4, **characterized by** the moisture screen (14) having at least one claw which is provided on the side of the embossment (16) in contact with the moisture screen (14) and which enables the embossment (16) to be attached to and detached from around the holes (15) in the moisture screen (14), and at least one housing which is provided around the holes (15) and which is suitable for engaging with the claw.

6. A refrigerator (1) as in Claim 5, **characterized by** the moisture screen (14) having the embossment (16) manufactured from an elastic material such as rubber, suitable for contact with food.

7. A refrigerator (1) as in any one of the above claims, **characterized by** the receptacle (7) having the front wall (10) composed of a first plate (17) and a second plate (18), the base (11) composed of the first plate (17) and the second plate (18), and an insulation material disposed between the first plate (17) and the second plate (18).

8. A refrigerator (1) as in Claim 7, **characterized by** the receptacle (7) having an insulation material such

as air, argon gas, styrofoam, and polyurethane which increases insulation.

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Figure 1

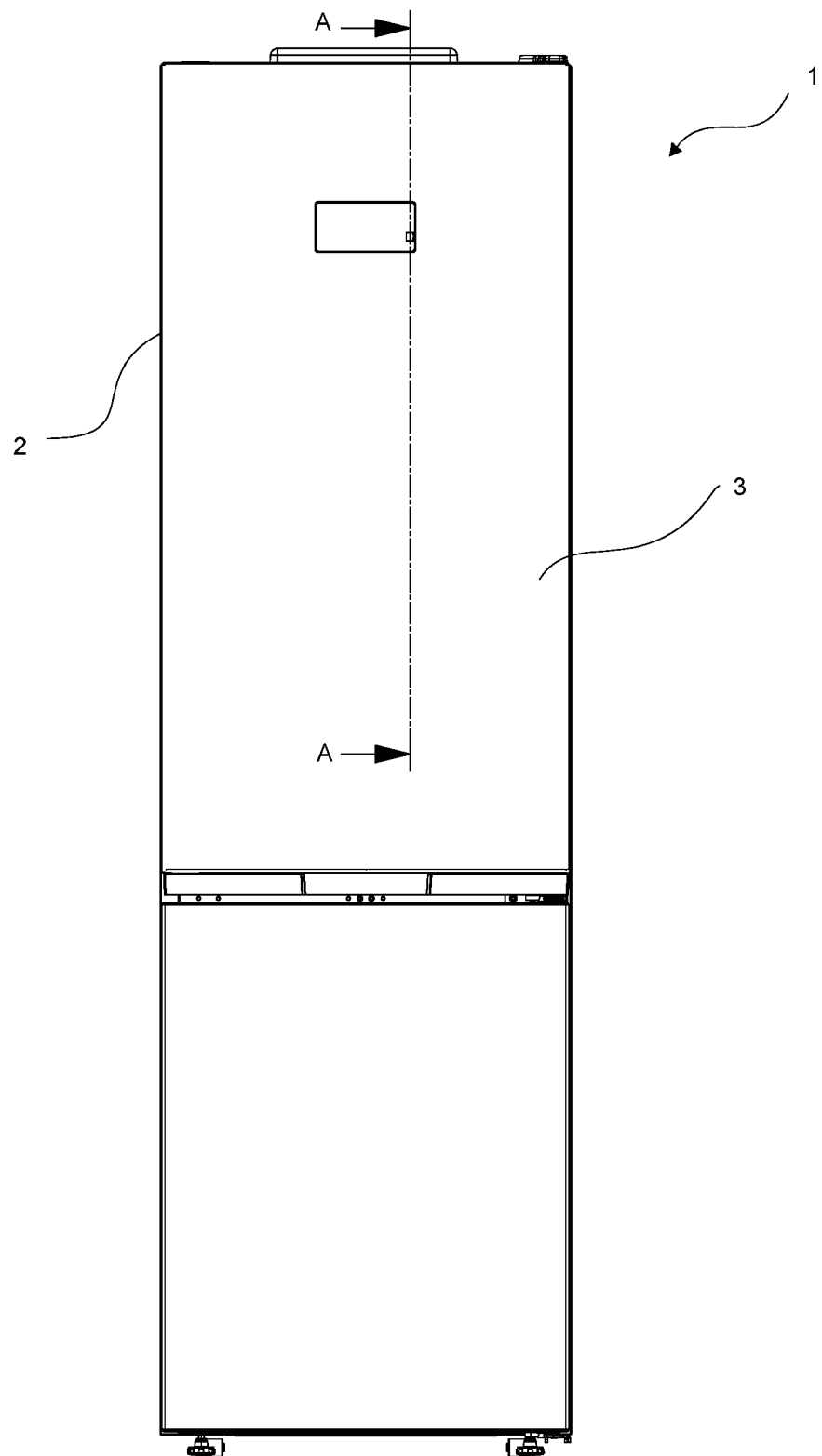


Figure 2

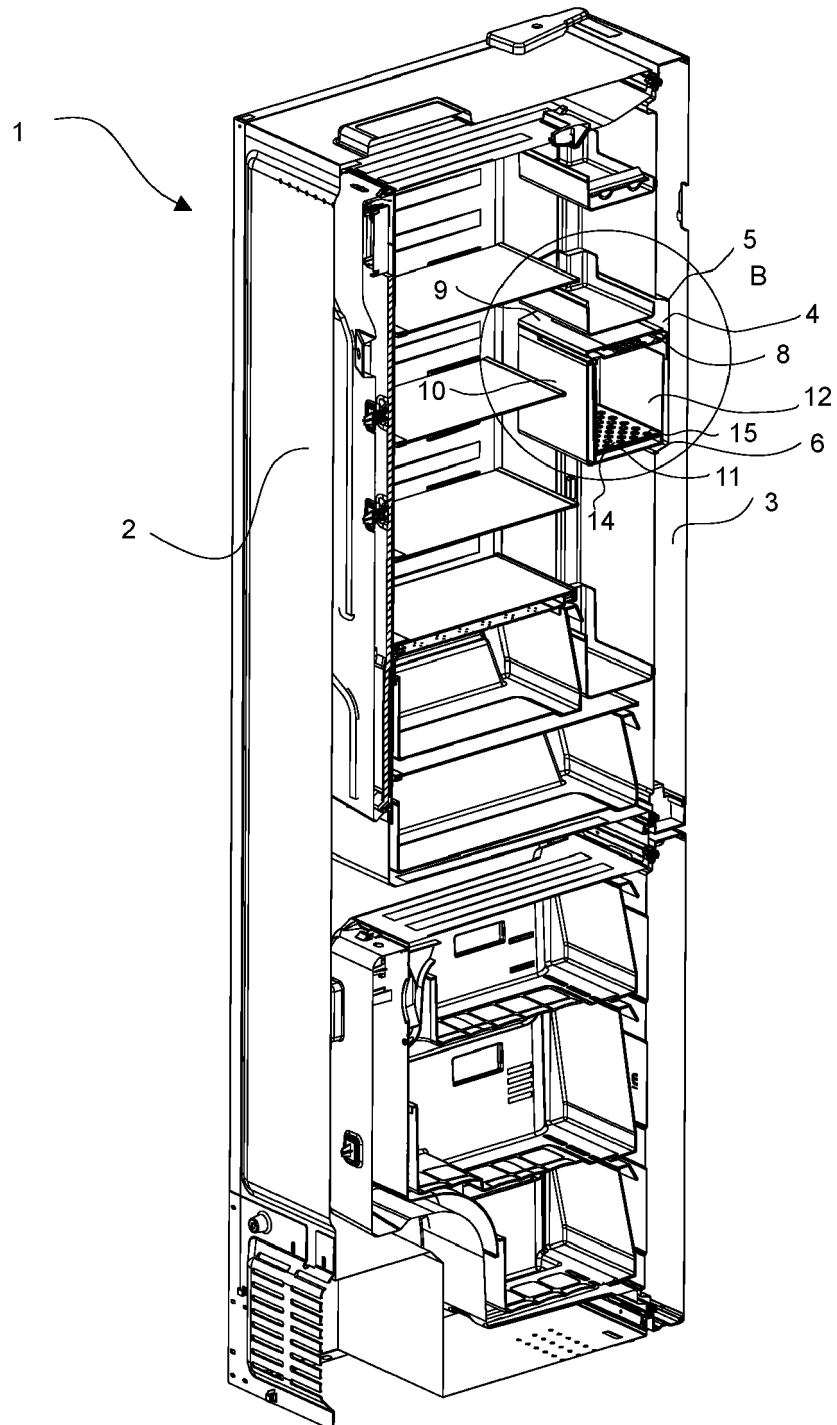


Figure 3

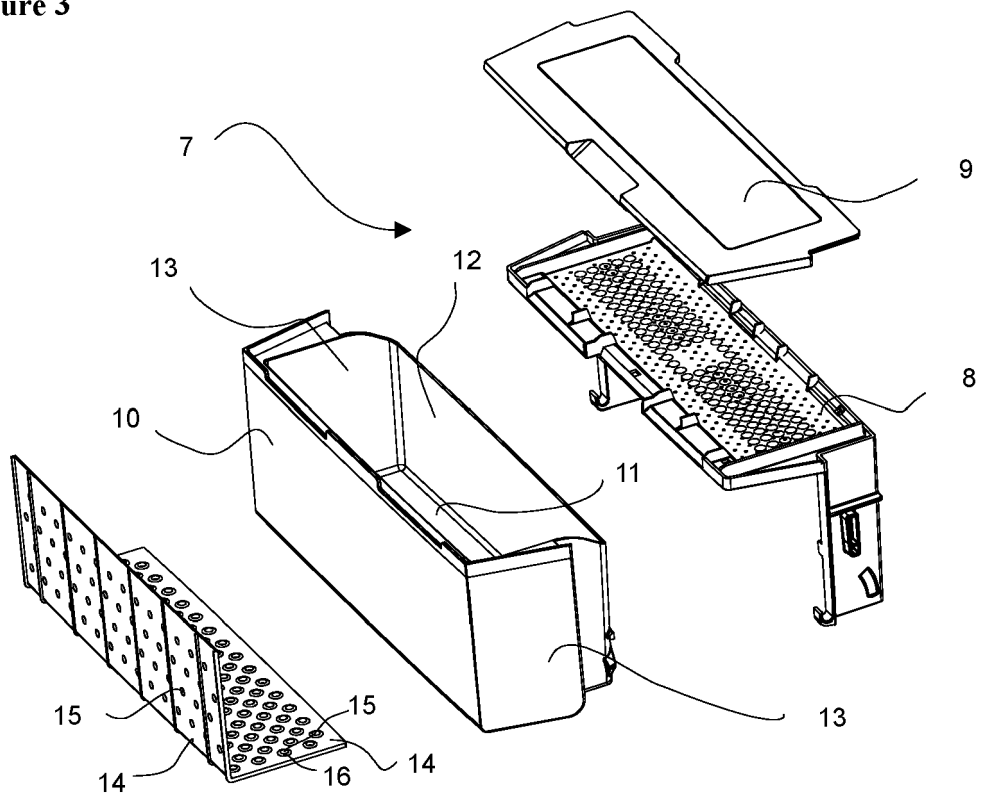
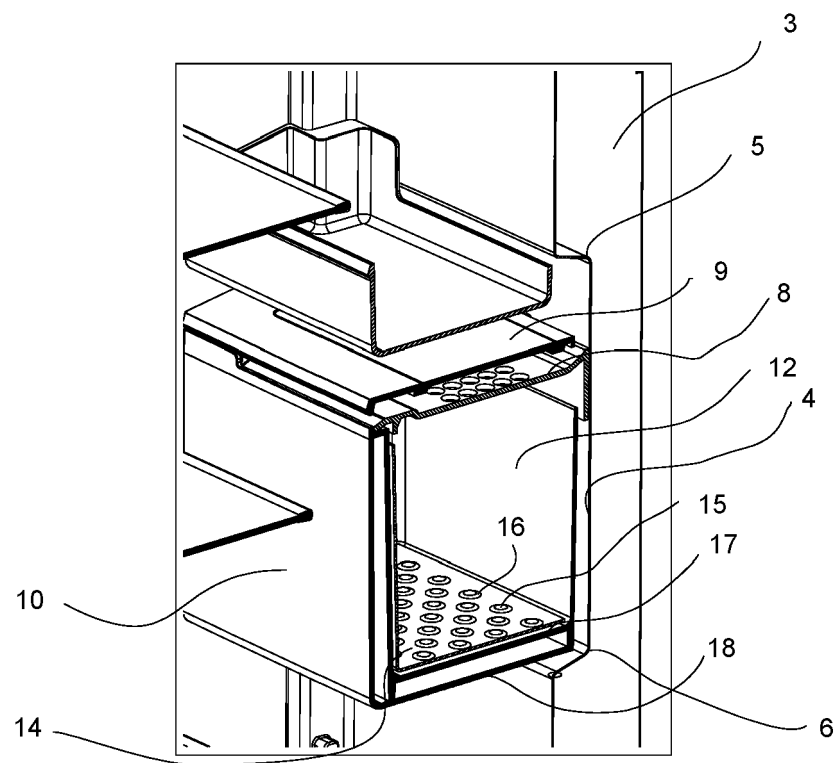


Figure 4





EUROPEAN SEARCH REPORT

Application Number

EP 23 18 8656

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EPO FORM 1503 03.82 (P04C01)

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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 13 February 2024	Examiner de Graaf, Jan Douwe
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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