



(11) Publication number : **0 505 171 A2**

(12) **EUROPEAN PATENT APPLICATION**

(21) Application number : **92302346.9**

(51) Int. Cl.⁵ : **F25D 21/14, F25D 25/00**

(22) Date of filing : **18.03.92**

(30) Priority : **19.03.91 NZ 237482**

(43) Date of publication of application :
23.09.92 Bulletin 92/39

(84) Designated Contracting States :
AT BE CH DE DK ES FR GB GR IT LI LU MC NL PT SE

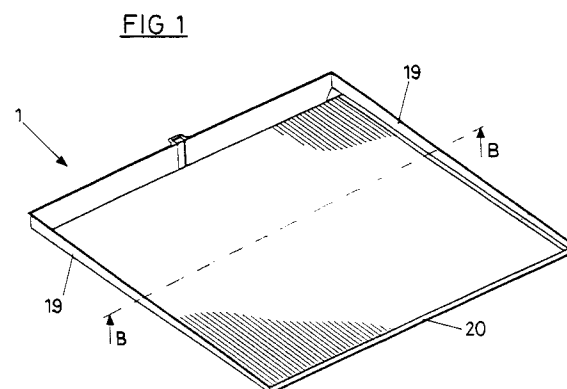
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(54) **Improvements in or relating to a condensate collector.**

(57) The invention relates to a condensate collector comprising a lid (1) having a downwardly facing portion (4) which is positioned over a vegetable bin 2 in a refrigerator (24). The downwardly facing portion (4) has a plurality of spaced apart, drainable elongate channels or grooves (9). Condensate formed as a result of fruit/vegetables in the vegetable bin (2) respiring collects in the channels or grooves (9) and tends to be drawn towards the upwardly disposed bases (10) thereof as a result of water tension. The ability of the condensate to collect in the grooves (9) is reliant on the dimensions and spacings of the grooves (9). The lid (1) is provided on a slight angle towards the rear of the refrigerator (24) so that condensate can drain to a baffle (13) and evaporate therefrom. A combination of the lid (1) and vegetable/fruit bin (2) is also claimed as is a method of collecting condensate using the condensate collector.



This invention relates to a condensate collector and has been designed particularly though not necessarily solely for use in association with a refrigerator fruit or vegetable bin.

Vegetables and fruit are often kept in a lidded food compartment in a refrigerator. As these vegetables and fruit are generally still respiring, the water produced may cause water droplets to condense and form on the cold upper surface of the vegetable bin lid. These droplets are then able to fall back onto the fruit and vegetables thus resulting in rotting and spoilage thereof. This is disadvantageous.

It is an object of the foregoing invention to provide an apparatus which will go at least some way to obviating or minimizing the foregoing disadvantages in a simple yet effective manner or which will at least provide the public with a useful choice.

Accordingly, the invention consists in a condensate collector comprising a member having a downwardly facing portion disposed substantially horizontally in use and having a plurality of spaced apart, drainable elongate grooves on said downwardly facing portion; the dimensions, spacings and disposition of said grooves being such that condensate collecting on said portion and walls of said grooves tends to migrate to the upwardly disposed bases of said grooves, any accumulation of said condensate being drained in use to a draining area.

In a second aspect, the invention consists in a lidded food compartment for use in a refrigerator comprising a container and a lid positionable over said container, said lid having a downwardly facing portion having a plurality of spaced apart, drainable, elongate grooves on said downwardly facing portion; the dimensions, spacings and disposition of said grooves being such that condensate collecting on said portion and walls of said grooves tends to migrate to the upwardly disposed bases of said grooves, any accumulation of said condensate being drained in use to a draining area.

In yet a further aspect the invention relates to a method of collecting and removing condensate from a selected area in a refrigerator comprising the step of positioning a lid over a food container in a refrigerator, said lid having a downwardly facing portion and having a plurality of spaced apart, drainable, elongate grooves on said downwardly facing portion wherein the dimensions, spacings and disposition of said grooves are such that condensate collecting on said portion and walls of said grooves tends to migrate to the upwardly disposed bases of said grooves, any accumulation of said condensate being drained in use to a draining area in said refrigerator.

In a further aspect, the invention relates to a cover of a self supporting material capable of stable location over foodstuffs positioned on a supporting surface or tray, said cover defining an inner face having at least one downwardly open channel formed therein to

extend from over a covered foodstuff in use to a lower position from which condensate collected in said channel(s) over the food can run under gravity which is not over the foodstuff, the channel configuration(s) in cross section being shaped and dimensioned to ensure condensate is retained in the channel by water tension yet can run there along under gravity.

Furthermore the invention consists in combination, a tray onto which a foodstuff can be positioned, and a cover positionable over a foodstuff positioned on the tray, said cover being of a self supporting material and being capable of stable location over said tray, said cover defining an inner face having at least one downwardly open channel to extend from over a covered foodstuff on said tray in use to a lower position from which condensate collected in said channel(s) can run under gravity to a position not over said foodstuff, the channel configuration(s) in cross-section being shaped and dimensioned to ensure condensate is retained in the channel(s) by water tension yet can run there along under gravity.

To those skilled in the art to which the invention relates, many changes in construction and widely differing embodiments and applications of the invention will suggest themselves without departing from the scope of the invention as defined in the appended claims. The disclosures and the descriptions herein are purely illustrative and are not intended to be in any sense limiting.

The preferred form of the invention will now be described with reference to the accompanying drawings wherein:

Fig 1 is a perspective view of a condensate collector in the form of a lid positionable over a vegetable bin according to one preferred form of the invention;

Fig 2 is a sectional end view through BB of the lid shown in Fig 1;

Fig 3 is an exploded view of the area X in Fig 2;

Fig 4 is a schematic drawing of a series of grooves according to an alternative preferred form of the invention; and

Fig 5 is a perspective view of a lid positioned over a vegetable bin according to one preferred embodiment of the invention, and;

Fig 6 is a cross sectional side view of the vegetable bin and lid of Fig 6 when located in a refrigerator according to one preferred form of the invention.

The invention relates to a condensate collector. The condensate collector can be used in any situation where condensate is formed and it is desirable to remove the condensate to a selected area.

In the preferred embodiment of the invention however, the condensate collector comprises a lid or cover 1 being positionable over a food container (such as a vegetable bin 2) in a refrigerator 24. In the embodiment of Fig 5, two vegetable/fruit bins 2 are shown.

Of course, a single tray or bin 2 could be provided.

Desirably, the lid or cover 1 is formed from plastics material. The condensate collector has a member 3 defining a downwardly facing portion 4 and is disposed substantially horizontally in use. In the preferred embodiment of the invention, a shelf 5 is provided in the refrigerator 24 and the lid or cover 1 can be affixed to the shelf 5 via loose hooks 6. Flat portions 7 may be provided at the front edge 20 and side edges 19 of the lid or cover 1. These portions 7 are able to rest on the peripheral edge of the food container 2. In this embodiment, when the vegetable bin 2 is pushed under the lid or cover 1 the lid or cover 1 is lifted slightly (by about 1mm for example) and this creates a seal, though imperfect, between the vegetable bin 2 and the portions 7 of the lid or cover 1.

Alternatively, the lid 1 can be formed so as to be substantially engageable with the vegetable bin 2.

The condensate collector has a plurality of spaced apart, drainable elongate grooves or channels 9 on the downwardly facing portion 4 thereof. Desirably, the grooves 8 are positioned substantially side-by-side. In alternative embodiments of the invention, however, the grooves or channels 9 may be provided in a rectangular pattern or in a circular pattern on the downwardly facing portion 4 of the lid 1.

Figs 2 & 3 show one preferred embodiment of the invention wherein the grooves 9 can be formed in plastic by vacuum forming. The grooves 9 have an upwardly disposed base 10 and a pair of side walls 11 extending downwardly from the base 10. The cross sectional width A of the upwardly disposed base 10 is preferably less than the distance B between the proximal ends of the side walls 11.

The distance B may for example be in the range between about 1.6mm to about 2.8mm so that a droplet of water is able to be retained in the groove or channel 9 and will not tend to be displaced downwardly by gravity. The distance A may for example be between about 1.5mm and 2.5mm in the embodiment of Fig 2 & 3.

The downwardly extending ridges or junctions 12 between adjacent grooves 9 may form part of the downwardly facing portion 4. In experiments conducted to date it has been found that small droplets of condensate forming on the ridges 12 tend to be drawn into the channels 9 and towards the upwardly disposed bases 10 thereof by water tension. It is desirable to maximise the area of plastic available in the channel 9 so that the condensate will be drawn therein under water tension.

In the embodiment of Fig 3, the angle C between side walls 11 of adjacent grooves 9 may, for example, be between about 15° to 30°. Preferably, the angle C is about 25°.

Fig 4 shows an alternative form of the invention. This shows a plurality of adjacent channels 9 which may be formed in plastic by injection moulding for

example. In this embodiment, the side walls 11 of the channels 9 are arranged in substantially inverted V-shaped formation. The angle D between the walls 11 of the V-shape may for example be between 15 to 30° and is preferably 25°. The internal apex of the V-shape or upwardly disposed base 10 of the groove 9 may have an extended surface area wherein the extended surface area can comprise a flat surface blended into the walls 11 of the grooves 9 or can comprise a curved surface of substantially semi-circular shape. This facilitates ease of cleaning the channels 9. The junctions 12 may be of radiused or planar shapes as this reduces the risk of physical damage to the thin sections between the channels 9.

In the embodiment of Fig 4, to increase the potential condensate loadings in the grooves 9 it is desirable to have a greater depth E of the inverted V-shape than the distance F between the proximal ends of the side walls 11 such that a given volume of condensate is exposed to a large surface area of plastic material which reduces the tendency of drops to form and escape from the grooves 9. For example, the depth E of the inverted V-shape may be between about 1mm to about 4mm. The distance F, of course, depends on the angle D and depth E chosen.

The dimensions, spacings and disposition of the grooves 9 are such that condensate collecting on the downwardly facing portion 4 as well as the walls 11 of the grooves 9 tends to migrate to the upwardly disposed bases 10 of the grooves 9 under water tension.

It is desirable to provide the grooves 9 at a slight angle relative to horizontal when positioned over the food bin 2. For example, the lid 1 may be constructed such that the tilt of the grooves 3 is a small angle of between about 2-3°. Therefore, any accumulation of condensate in the grooves 9 can be drained in use to a draining area under gravity. The draining area may be formed on a downwardly extending portion of the lid 1. For example, a downwardly extending baffle 13 may be provided which extends transversely to the grooves 9. Desirably, the length of each groove 9 is longer than the length of the bin 2 from the front face 21 to the rear face 22 thereof (by about 10% for example). Thus, the ends of the grooves 9 in the overlapping area 14 extend away from the open area of the bin 2 so droplets do not fall on food located in the bin 2.

Many different ways of providing the grooves or channels 9 at a slight angle relative to horizontal are envisaged. The embodiment shown in Fig 6 is just one of these. As shown in Fig 6, the side walls 19 of the lid 1 may taper from the overlapping area 14 to the front edge 20 of the lid 1. The front wall 21 of the bin 2 may similarly be longer than the rear wall 22 of the bin 2. A locating member 23 may be provided in the refrigerator 24 to locate the vegetable bin 2 in the designed disposition. The loose hooks 6 hold the lid 1 in the required disposition such that the grooves 9

are provided on a slight tilt towards the rear inside face of the refrigerator 24. Accordingly, condensate forming a result of vegetables or fruit in the bin 2 respiring is collected in the channels 9 and can slowly drain to the draining area 13 where it can evaporate or drain to the back of the refrigerator 24.

Alternative means for draining condensate from the grooves 3 are clearly envisaged. For example, the lid 1 may normally be provided horizontally and may be manually tilted so as to drain the condensate from the grooves 9 and the lid 1 can then be removed for cleaning.

Experiments conducted to date indicate that, after cleaning with detergent, the ability of the grooves 9 to hold condensate is enhanced.

Thus it can be seen that in at least the preferred form of the invention a condensate collector is provided which, surprisingly, can store substantial amounts of condensate formed when, for example, vegetables or fruit contained within a vegetable bin in a refrigerator respire. The condensate collector can be made self-draining which is desirable.

The features disclosed in the foregoing description, in the following claims and/or in the accompanying drawings may, both separately and in any combination thereof, be material for realising the invention in diverse forms thereof.

Claims

1. A condensate collector comprising a member (3) having a downwardly facing portion (4) disposed substantially horizontally in use and having a plurality of spaced apart, drainable elongate grooves (9) on said downwardly facing portion (4); the dimensions, spacings and disposition of said grooves (9) being such that condensate collecting on said portion (4) and walls (11) of said grooves (9) tends to migrate to the upwardly disposed bases (10) of said grooves (9), any accumulation of said condensate being drained in use to a draining area.
2. A condensate collector as claimed in claim 1 in the form of a lid (1) positionable over a food bin (2) in a refrigerator (24) in use.
3. A condensate collector as claimed in claim 1 or claim 2 wherein each said groove (9) comprises said upwardly disposed base (10) and a pair of side walls (11) extending downwardly therefrom.
4. A condensate collector as claimed in claim 3 wherein the cross-sectional width (A) of said upwardly disposed base (10) is less than the distance (B) between the proximal ends of said side walls (11).
5. A condensate collector as claimed in claim 4 wherein said distance (B) between said proximal ends of said side walls (11) is between about 1.6mm to about 2.8mm.
6. A condensate collector as claimed in any one of the preceding claims wherein said grooves (9) are disposed at a slight angle relative to horizontal such that said condensate can drain to said draining area.
7. A condensate collector as claimed in claim 6 wherein said slight angle is between about 2° to about 3°.
8. A condensate collector as claimed in claim 1 or claim 2 wherein said walls (11) of said grooves (9) are arranged in substantially inverted V-shaped formation.
9. A condensate collector as claimed in claim 8 wherein the angle (D) between said walls of said V-shape is between about 15° to about 30°.
10. A condensate collector as claimed in claim 8 or claim 9 wherein the junctions (12) between parts of said portion (4) and said grooves (9) are of shapes selected from radiused and planar shapes such that the tendency of water droplets to form at said junctions (12) is reduced.
11. A condensate collector as claimed in any one of claims 8 to 10 wherein the internal apex (10) of said V-shape has an extended surface area, wherein said extended surface area is selected from a flat surface blended into said walls of said grooves and a curved surface of substantially semi-circular shape.
12. A lidded food compartment for use in a refrigerator comprising a container (2) and a lid (1) positionable over said container, said lid having a downwardly facing portion (4) having a plurality of spaced apart, drainable, elongate grooves (9) on said downwardly facing portion (4); the dimensions, spacings and disposition of said grooves (9) being such that condensate collecting on said portion (4) and walls (11) of said grooves (9) tends to migrate to the upwardly disposed bases (10) of said grooves (9), any accumulation of said condensate being drained in use to a draining area.
13. A method of collecting and removing condensate from a selected area in a refrigerator (24) comprising the step of positioning a lid (1) over a food container (2) in a refrigerator (24), said lid (1) having a downwardly facing portion (4) and having a

plurality of spaced apart, drainable, elongate grooves (9) on said downwardly facing portion (4) wherein the dimensions, spacings and disposition of said grooves (9) are such that condensate collecting on said portion (4) and walls (11) of said grooves (9) tends to migrate to the upwardly disposed bases (10) of said grooves (9), any accumulation of said condensate being drained in use to a draining area in said refrigerator (24).

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14. A cover (1) of a self supporting material capable of stable location over foodstuffs positioned on a supporting surface or tray (2), said cover (1) defining an inner face (4) having at least one downwardly open channel formed therein to extend from over a covered foodstuff in use to a lower position from which condensate collected in said channel(s) (9) over the food can run under gravity which is not over the foodstuff, the channel (9) configuration(s) in cross section being shaped and dimensioned to ensure condensate is retained in the channel (9) by water tension yet can run there along under gravity.

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15. A cover (1) as claimed in Claim 14 wherein there are a plurality of channels (9).

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16. In combination, a tray (2) onto which a foodstuff can be positioned, and a cover (1) positionable over a foodstuff positioned on the tray (2), said cover (1) being of a self supporting material and being capable of stable location over said tray (2), said cover (1) defining an inner face (4) having at least one downwardly open channel (9) to extend from over a covered foodstuff on said tray (2) in use to a lower position from which condensate collected in said channel(s) (9) can run under gravity to a position not over said foodstuff, the channel (9) configuration(s) in cross-section being shaped and dimensioned to ensure condensate is retained in the channel(s) (9) by water tension yet can run there along under gravity.

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FIG 1

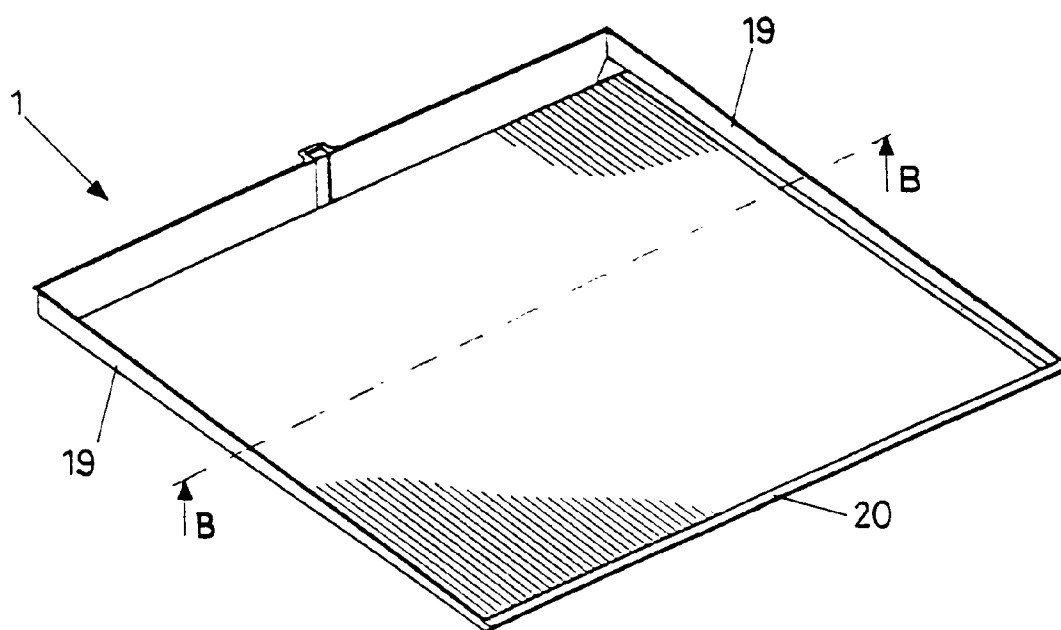


FIG 2

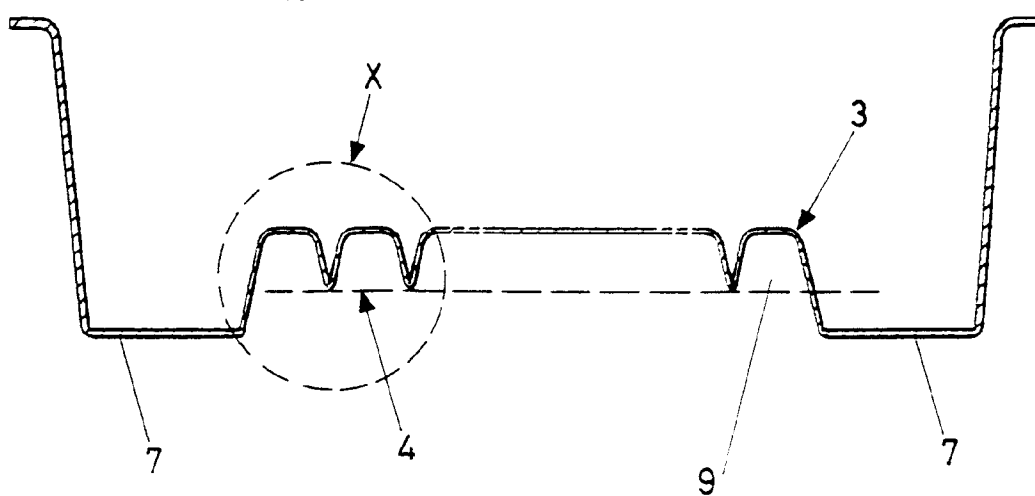
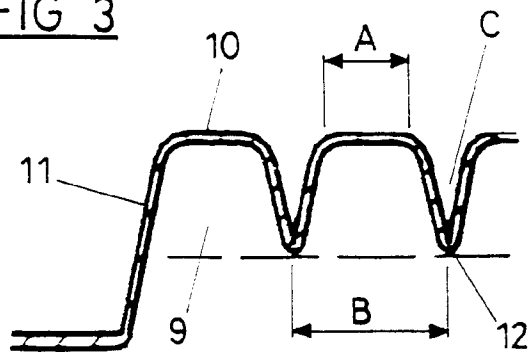


FIG 3



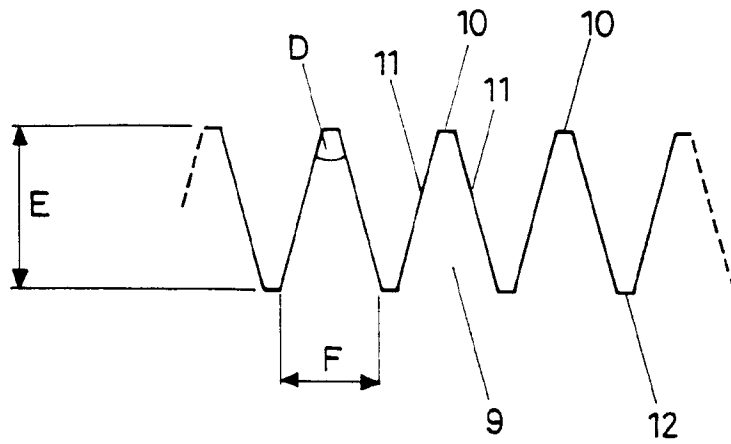


FIG 4

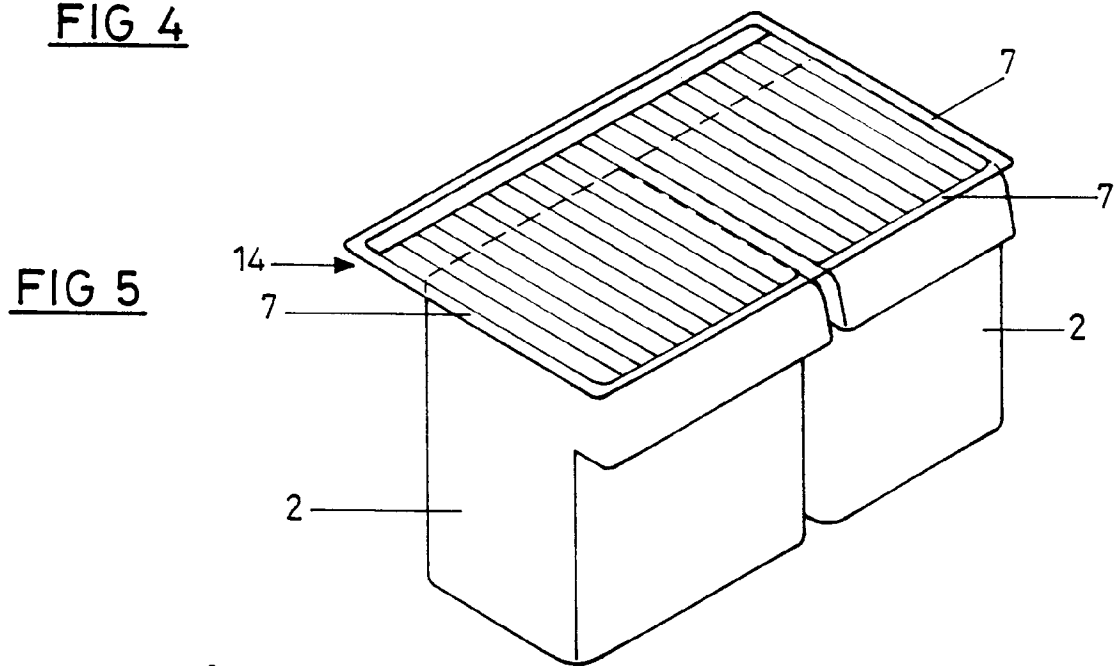


FIG 5

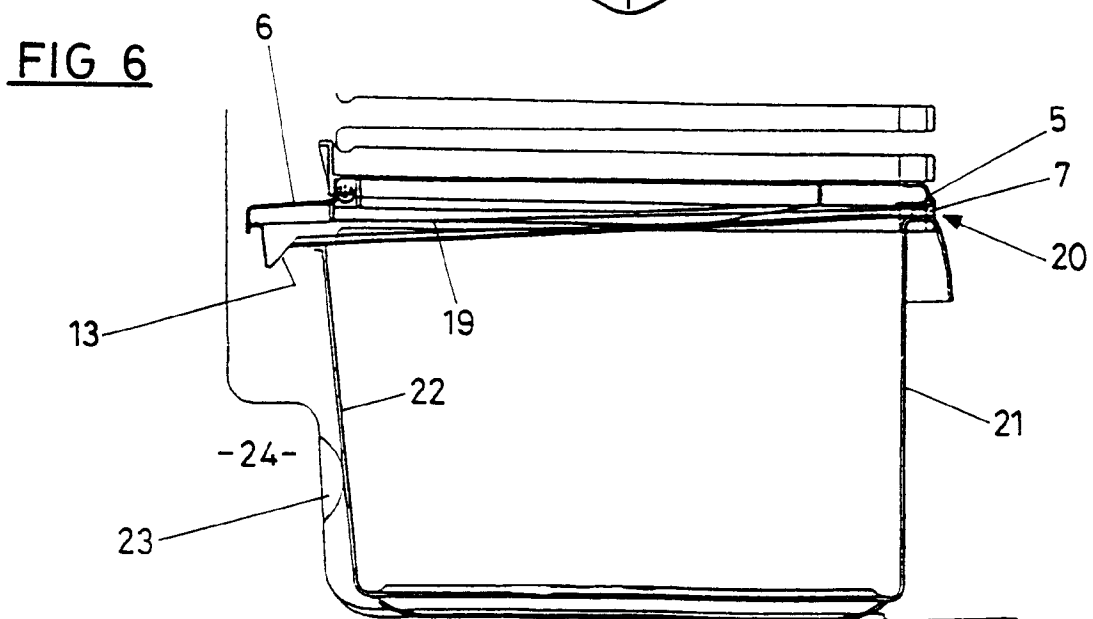


FIG 6