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(54) **ICE-CREAM DISPLAY CABINET AND ICE-CREAM DRAWERS**

(57) An ice-cream display cabinet (1) for storing and displaying bulk ice-cream in tubs includes a technical counter (10) and a refrigerable display cabinet (20) arranged above the technical counter (10). The refrigerable display cabinet (20) extends in a vertical direction (Y) perpendicular to the horizontal floor (0) and houses ice-cream tubs (200) arranged on planes (P1, P2, P3) parallel and spaced from each other along the vertical direction (Y) in the inner compartment (22) of the display cabinet (1). The ice-cream tubs (200) are removable from the inner compartment (22) to reach the extracted configuration in which they are supported cantilevered by the refrigerable display cabinet (20). An ice-cream drawer (30) is suitable for being inserted and extracted from the ice-cream display cabinet and comprises a refrigerable element (201) made at least partially in a heat-storing material.

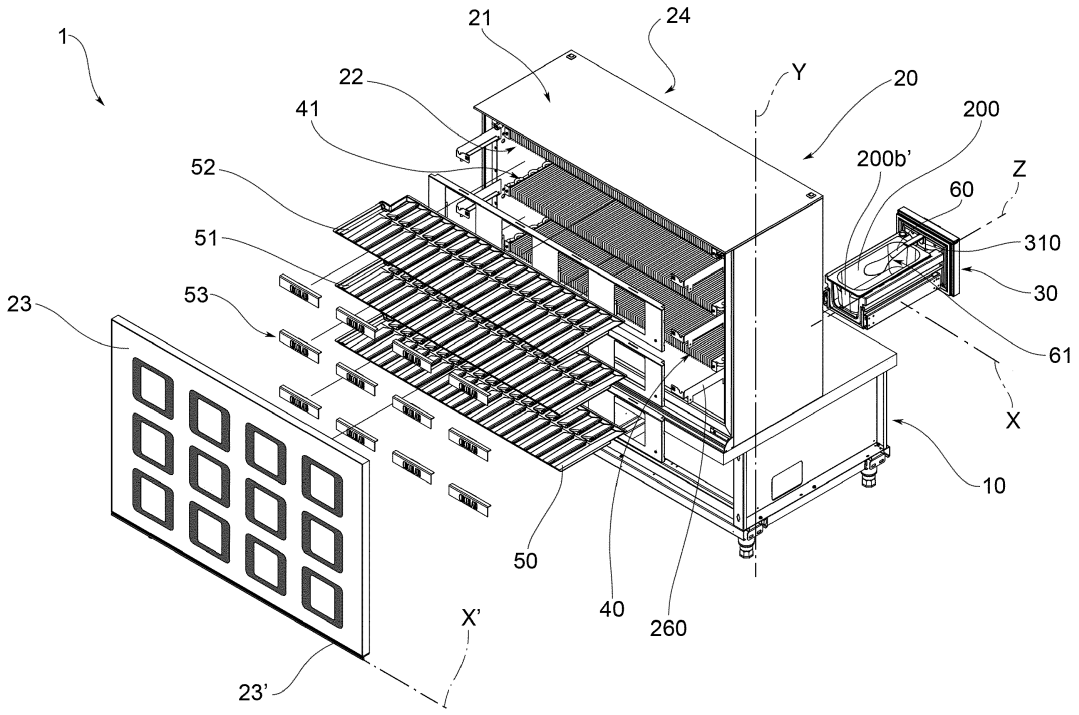

FIG.1

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Description

[0001] The present invention relates to an ice-cream display cabinet. In particular, the invention relates to an ice cream display cabinet for an ice cream parlour, of the type suitable for holding and serving loose bulk ice-cream in tubs, for example a handmade ice-cream.

[0002] Two main types of display cabinets or counters for ice-creams are known in the art. One type is represented by the ice counters of the well type, in which the ice-cream is held into cylindrical containers with vertical development, placed in a refrigerated counter and provided with a lid. Another type is represented by the display windows of the "visible ice-cream" type, in which the ice-cream is contained in ice-cream tubs without a lid, arranged side by side in a refrigerated counter provided with a transparent display cabinet, in such a way that the consumer is attracted by the sight of the ice-cream.

[0003] Compared to well counters, the ice-cream display cabinets allow ice-cream to be served more quickly, both because the gelato flavours are clearly visible and attractive to the consumer, and because the operator does not need to open and close the tub lid, as in the case of the well. However, the ice-cream contained in the display cabinets provided with tubs without a lid is more subjected to temperature changes and is not stored in an optimal manner, as is the case in well counters. Moreover, since the tubs are arranged next to each other, it often happens that ice-cream residues infiltrate in the spaces between the counter and the tub and between each tub, thus causing mould and bacteria to proliferate.

[0004] In an inconvenient manner, moreover, in both types of ice-cream counter/display cabinet, the operator is forced to bend down several times to access the ice-cream well or tub to take ice-cream, assuming uncomfortable positions and working in a poorly ergonomic environment.

[0005] It is clear, therefore, that each of the aforementioned types ice-cream counter/display cabinet suffers from drawbacks linked to the reasons listed above.

[0006] One of the objects of the present invention is to provide an ice-cream display cabinet that is able to overcome the drawbacks of the ice-cream counters and display cabinets of the prior art, in such a way as to ensure an adequate preservation of the ice-cream and at the same time improve the ergonomics of the operator when serving the ice-cream, while maintaining the advantages of the ice-cream display cabinets of the prior art.

[0007] This object is achieved by an ice-cream display cabinet and an ice-cream drawer according to the appended independent claims. The dependent claims describe embodiment variations.

[0008] The features and the advantages of present invention will appear more clearly from the following description, made by way of an indicative and non-limiting example with reference to the accompanying figures, in which:

- figure 1 is an exploded perspective view of the ice-cream display cabinet according to an embodiment of the present invention;
- figure 2 is a front view of the ice-cream display cabinet in figure 1, according to an embodiment of the present invention;
- figure 3 is a sectional view along the vertical plane A-A in figure 1 of the ice-cream display cabinet according to an embodiment of the present invention;
- figure 4 is a sectional view along the vertical plane A-A in figure 1 of the ice-cream display cabinet according to an embodiment of the present invention, in a configuration with the ice-cream drawer removed;
- figure 5 is a sectional view along the vertical plane A-A in figure 1 of the ice-cream display cabinet according to an embodiment of the present invention, in which the ice-cream drawer is shown in an exploded form;
- figure 6 is a sectional view along the vertical plane A-A in figure 1 of the ice-cream display cabinet according to an embodiment of the present invention, in an open display cabinet configuration;
- figure 7 is a sectional view along the vertical plane A-A in figure 1 of the ice-cream display cabinet according to an embodiment of the present invention, in an open display cabinet configuration, in which an expositive wall is inclined to allow the extraction of a condensate collection pan shown in the extracted configuration;
- figure 8 is a sectional view of the ice-cream display cabinet according to a further embodiment of the present invention.

[0009] According to the accompanying figures, reference numeral 1 indicates an ice-cream display cabinet for ice-cream parlours for preserving and displaying bulk ice-cream in tubs. The ice-cream display cabinet 1 comprises a technical counter 10, suitable to be placed on a horizontal floor O and to contain refrigeration means 11. The refrigerating means comprise any means known to the person skilled in the art for refrigerating a compartment of an ice-cream counter, for example a refrigeration system comprising a compressor, a refrigerant fluid and the related refrigerant fluid circulating circuits.

[0010] The ice-cream display cabinet 1 further comprises a refrigerable display cabinet 20 placed above the technical counter 10 and comprising structural walls 21 that define an inner compartment 22 refrigerable by the refrigeration means 11. The refrigerable display cabinet 20 extends in a vertical Y direction perpendicular to the horizontal floor O and houses ice-cream tubs 200 suitable to hold bulk ice-cream.

[0011] When contained in the inner compartment, the ice-cream tubs 200 are placed on parallel floors P1, P2, P3 mutually spaced along the vertical direction Y.

[0012] Moreover, the ice-cream tubs 200 are removable from the inner compartment 22 in an extraction direction Z to reach the extracted configuration in which the ice-cream tubs 200 are supported cantilevered by the refrigerable display cabinet 20.

[0013] In a preferred embodiment, the refrigerable display cabinet 20 has a box-like shape, in which the structural walls 21 of the display cabinet are arranged in a configuration equivalent to the walls of a box.

[0014] Preferably, each ice-cream tub 200 comprises a refrigerable element 201 arranged around and in contact with the ice-cream tub 200. This refrigerable element 201 is made at least partially in a heat-storing material, having a thermal capacity suitable to accumulate refrigerant thermal energy when the ice-cream tub 201 is inserted in the inner compartment 22 and to yield refrigerant thermal energy (heat exchange) to the ice-cream when the ice-cream tub is extracted from the inner compartment 22, to reduce the melting time of the ice-cream.

[0015] Preferably, in the case of an ice-cream tub formed by a bottom wall 200a and side walls 200b, the refrigerable element 201 is arranged around the tub in such a way as to leave at least one 200b' of the side walls 200b of the tub free.

[0016] Preferably, the refrigerable element is a container having an inner chamber containing a refrigerable liquid or a eutectic mixture, so as to maintain the ideal temperature of the ice-cream for as long as possible, when the ice-cream tub 200 is extracted from the refrigerable display cabinet 20.

[0017] In a preferred embodiment, the ice-cream display cabinet 1 comprises sliding ice-cream drawers slidably supported by the refrigerable display cabinet 20. Each of these sliding ice-cream drawers 30 contains one or a plurality of ice-cream tubs 200.

[0018] In a preferred embodiment, each ice-cream tub 30 contains a single ice-cream tub 200.

[0019] Preferably, the ice-cream drawers 30 are extractable in the extraction direction Z and in a direction suitable as to allow access to the ice-cream tub by an operator.

[0020] The refrigerable element 201 is directly fixed and supported by the ice-cream tub 200 or, in the embodiment in which the ice-cream tub is inserted in an ice-cream tub 30, this refrigerable element 201 is supported by the ice-cream drawer 30 or is integrally formed with the ice-cream drawer.

[0021] In a preferred embodiment, the ice-cream tubs 200 are also arranged alongside each other along a longitudinal direction X perpendicular to the vertical direction Y to form longitudinal rows 210, 211, 212 of tubs. In this way, the ice-cream tubs 200 are arranged in a matrix configuration, for example as shown in figure 1 and in figure 2. In this matrix configuration, the rows of the matrix are represented by the longitudinal rows 210, 211, 212 and the columns 220, 221, 222, 223 are represented by the tubs stacked on the planes P1, P2, P3 parallel and spaced from one another along the vertical direction Y.

[0022] Preferably, between one longitudinal row 210 of tubs and an adjacent row 211 in the vertical direction Y, at least one evaporator 40, 41, 22 is placed to refrigerate the inner compartment 22.

[0023] In another embodiment (not shown in the figures), between a column 220 of trays and an adjacent column 221, at least one evaporator is interposed for cooling the inner compartment 22, arranged along a vertical plane parallel to the vertical direction Y.

[0024] In a further embodiment, the evaporators are in contact with or buried in the structural walls 21 of the refrigerable display cabinet 20.

[0025] Each evaporator is operatively connected to the refrigeration means 11 by suitable connecting means, for example by means of pipes.

[0026] In the embodiment variant in which the inner compartment is cooled by at least one evaporator 40, 41, 42, between a longitudinal row 210, 211 of tubs and an adjacent row 211, 212 in the vertical direction Y, a condensate collection pan 50, 51, 52 is interposed, arranged below the evaporator 40, 41, 42, so as to prevent the condensate from falling into the underlying ice-cream tubs 200 or from the sliding ice-cream drawer 30. Preferably, the condensate collection pan is extractably supported by the refrigerable display cabinet 20.

[0027] Preferably, the refrigerable display cabinet 20 comprises a display wall 23, made at least partially from transparent material and suitable to be placed on a display side for a consumer customer. In other words, the display wall is suitable for facing the consumer when the ice-cream display cabinet 1 is installed in an ice-cream parlour. In front of the display wall 23, the refrigerable display cabinet 20 comprises an operating side 24, adapted to be accessible by an operator for taking the ice-cream from the ice-cream tubs 200. In other words, the operating side 24 is suitable for being directed towards the operator serving the ice-cream to the consumer when the ice-cream display cabinet 1 is installed in an ice-cream parlour. On the operating side 24, on the sliding ice-cream drawers 30, gripping means 31 are fixed, for example a handle or a groove, for the extraction of the sliding ice-cream drawers 30 from the operating side 24 towards the operator. Preferably, in the vicinity of the gripping means 31, each ice-cream drawer comprises a label seat, suitable for receiving a taste marker, such as a taste label or a taste label support.

[0028] In a preferred embodiment, when the refrigerable element 201 is arranged around the tub in such a way as to leave at least one 200b' of the side walls 200b of the tub free, this free wall 200b' is arranged in front of the display wall 23, in such a way that the ice-cream contained in the ice-cream container 200 is visible through such a free wall 200b' and through the display wall 23.

[0029] Preferably, the ice-cream tub 200 is made at least partially in a transparent material, even more preferably a transparent plastic material (such as a polycarbonate). More particularly, at least one of the side walls

200b of the ice- cream tub 200 is made of a transparent material.

[0030] In a preferred embodiment, the ice-cream tub 200 is totally made of a transparent material.

[0031] Preferably, the display wall 23, at a perimeter side 23' thereof, is connected to the refrigerable display cabinet 20 in a manner rotatable about an axis of rotation X', preferably parallel to the longitudinal direction X, so as to be rotated by an operator to open the refrigerable display cabinet and allow access to the inner compartment 22 from the display side, i.e. from the side of the display wall 23.

[0032] Preferably, the display wall 23 comprises a peripheral frame and a double glass or a triple glass, preferably translucent or transparent, contained in the peripheral frame, for example like a window. This allows the consumer to see the ice-cream contained inside the ice-cream tubs through the display wall 23.

[0033] Preferably, moreover, the display wall 23 is fixed to the refrigerable display cabinet 20 by means of a hinge mechanism 230.

[0034] In one embodiment, the refrigerable display cabinet 20 comprises supporting and accompanying means 231 of the display wall 23 during movement of the display wall. Said supporting and accompanying means 231, such as a gas spring, are suitable for supporting at least partially the display wall to accompany it during the rotation movement for opening the refrigerable display cabinet 20. This facilitates the operation of opening the display case by an operator to allow cleaning of the display wall 23 (in double or triple glass), on the side facing the inner compartment 22 or for changing taste labels 53 arranged between the display wall 23 and the inner compartment 22 when the display wall 23 is closed.

[0035] Preferably, the supporting and accompanying means 231 are suitable for accompanying the display wall 23 up to a first end-of-travel position, wherein the display wall 23 is inclined by a predefined angle $\alpha 1$ with respect to the vertical. Furthermore, the supporting and accompanying means 231 are preferably adapted to allow further rotation of the display wall, beyond the first end-of-travel position, for example as shown in figure 7, in which the gas spring is unhooked to allow a larger rotation of the display wall 23, until it reaches a second end-of-travel position, in which the display wall 23 is constrained in a position inclined with respect to the vertical by an angle $\alpha 2$ greater than $\alpha 1$.

[0036] Preferably, the refrigerable display cabinet 20 comprises at least one lighting device suitable for illuminating the display wall 23 from the side facing the inner compartment 22, so that the ice-cream tubs and/or the taste labels are illuminated. In one embodiment, the lighting device is a led bar arranged in the longitudinal direction X above each row of ice-cream tubs.

[0037] It is clear that it is also an object of the present invention an ice-cream drawer 30 suitable for being inserted in an ice-cream display cabinet described thus far and comprising the refrigerable element 201. The refrigerable element 201 comprises a tub seat 210 suitable for receiving the ice-cream tub 200 according to a shape coupling.

[0038] According to an embodiment, the ice-cream drawer 30, in addition to the refrigerable element 201, comprises a drawer frame 301 which supports the refrigerable element (for example, is fixed by fastening means to the refrigerable element) and which is suitable for sliding in the refrigerable display cabinet on sliding guides 260.

[0039] Preferably, the refrigerable element 201 is a container element having structural container walls 201' which define an inner chamber 202 containing a refrigerable liquid or a eutectic mixture.

[0040] The structural container walls 201' are in contact on one side with the inner chamber 202 and on the other side are suitable for receiving in contact the ice-cream tub 200.

[0041] In a further variant embodiment, the structural container walls 201' are integrally made with the drawer frame 301.

[0042] The ice-cream drawer 30 further comprises a drawer front 302, fixed to the drawer frame 301 and comprising the handle 31 for extracting the drawer. Preferably, on the drawer front, a seal 303 is fixed which is adapted to be in contact with an abutment wall 240 of the refrigerable display cabinet 20.

[0043] According to an embodiment, the ice-cream drawer further comprises a scoop interlocking 310, suitable for receiving a handle 60 of a scoop 61 for collecting ice-cream to support the scoop integrally with the ice-cream drawer and above the ice-cream tub 200, preferably in such a way that the scoop 61 is arranged parallel to the bottom wall 200a of the ice-cream tub.

[0044] Innovatively, the ice-cream display cabinet according to the present invention, due to a vertical arrangement of the product and the presence of removable ice-cream tubs, eliminates the drawbacks of the ice-cream counters and cabinets of the prior art. In particular, the ice-cream display cabinet ensures an adequate preservation of the ice-cream and at the same time improves the ergonomics of the operator during the ice-cream service operation.

[0045] Advantageously, the vertical display of the product allows optimising the space and creating a greater visual communication with the consumer. The consumer is visually attracted by the view of the ice-cream which is shown vertically on horizontal and vertical rows, through the transparent display wall and tub. Moreover, the vertical arrangement of the tubs allows limiting the depth of the ice-cream display cabinet, allowing the installation thereof even in small places.

[0046] In an embodiment that is particularly advantageous and attractive for the consumer, the display wall 23 is transparent only in some regions (such as windows), at the ice-cream tubs 200, so as to focus attention.

[0047] Advantageously, the independent opening of individual ice-cream drawers facilitates the use of ice-

cream, making it neat, clean and simple. Moreover, the vertical arrangement of the tubs and their convenient extractability inside and outside the refrigerable display cabinet allows the operator to serve the ice-cream in a more ergonomic manner, maintaining an upright position, without tiring and uncomfortable body movements.

[0048] Advantageously, due to the presence of an inner compartment of the cabinet that is completely closed, the ice-cream is preserved in an optimal manner. Moreover, the further presence of seals on the drawers and also on the display wall ensures the permanence of a refrigerated environment as much as possible controlled, limiting the dispersion of refrigerated air (and therefore energy consumption).

[0049] Furthermore, during the service step, when the ice-cream tub is taken from the inner compartment, the ice-cream tub is kept refrigerated by the refrigerable element arranged around the tub, which acts as a cold accumulator.

[0050] In an even more advantageous manner, the eutectic mixture contained in the refrigerable element ensures a better maintenance of the optimal temperature of the ice-cream when the ice-cream tub is taken.

[0051] Furthermore, the possibility of opening the refrigerable display cabinet on the side of the display wall by a simple rotation makes the inspection of the inner compartment for maintenance and cleaning easy.

[0052] It is clear that a man skilled in the art may make changes to the invention described above in order to meet incidental needs, all falling within the scope of protection defined in the following claims.

Claims

1. Ice-cream display cabinet (1) for storing and displaying bulk ice-cream in tubs, comprising:

   - a technical counter (10), suitable to be placed on a horizontal floor (O) and to contain refrigeration means (11) ;
   - a refrigerable display cabinet (20) placed above the technical counter (10) and comprising structural walls (21) that define an inner compartment (22) refrigerable by the refrigeration means (11);

   said refrigerable display cabinet (20) extending in a vertical (Y) direction perpendicular to the horizontal floor (O) and housing ice-cream tubs (200) suitable to hold bulk ice-cream,
   wherein said ice-cream tubs (200) are placed on parallel floors (P1, P2, P3) spaced in a vertical direction (Y) when contained in the inner compartment (22),
   said ice-cream tubs (200) being removable from the inner compartment (22) in an extraction direction (Z) to reach the extracted configuration in which said ice-cream tubs (200) are supported cantilevered by the refrigerable display cabinet (20).

2. Ice-cream display cabinet (1) according to claim 1, wherein each of said ice-cream tubs (200) comprises a refrigerable element (201) placed at least partially around and in contact with the ice-cream tub (200), said refrigerable element (201) being made at least partially in a heat-storing material, suitable to accumulate refrigerant thermal energy when the ice-cream tub (200) is inserted in the inner compartment (22) and to give off refrigerant thermal energy (heat exchange) to the ice-cream when the ice-cream tub (200) is extracted from the inner compartment (22).

3. Ice-cream display cabinet (1) according to claim 1 or 2, comprising sliding ice-cream drawers (30) slidingly supported by the refrigerable display cabinet (20),
   wherein said tubs (200) are contained in said sliding drawers (30).

4. Ice-cream display cabinet (1) according to claim 3, wherein the sliding ice-cream drawers (30) are extractable in the extraction direction (Z) and so as to allow access to the ice-cream tub by an operator.

5. Ice-cream display cabinet (1) according to the claims 2 or 3 and 4 in which the refrigerable element (201) is a container having an inner chamber (202) containing a refrigerable liquid.

6. Ice-cream display cabinet (1) according to the claims 2 or 3 and 4 in which the refrigerable element (201) is a container having an inner chamber (202) containing a eutectic mixture.

7. Ice-cream display cabinet (1) according to any of the preceding claims, wherein the ice-cream tubs (200) are also arranged juxtaposed with each other in a longitudinal direction (X) perpendicular to the vertical direction (Y) to form longitudinal rows (210, 211, 212) of tubs, so that said tubs are arranged in a matrix configuration, in which the rows of the matrix are represented by longitudinal rows (210 , 211, 212) and the columns of the matrix are represented by tubs of ice-cream stacked on said planes (P1, P2, P3) parallel and spaced in the vertical direction (Y).

8. Ice-cream display cabinet (1) according to claim 7, wherein between one (210) of said longitudinal rows (210, 211, 212) of ice-cream tubs and an adjacent row (211) in the vertical direction (Y) at least one evaporator (40, 41, 22) is placed to refrigerate the inner compartment (22) .

9. Ice-cream display cabinet (1) according to claim 8, wherein between one of said longitudinal rows of tubs and an adjacent row in the vertical direction (Y)

a condensate collection pan (50, 51, 52) is interposed, placed under the evaporator (40, 41, 42).

10. Ice-cream display cabinet (1) according to any of the claims from 3 to 9, wherein the refrigerable display cabinet (20) comprises

- a display wall (23), made at least partially from transparent material and suitable to be placed on a display side for a consumer customer,
- and an operating side (24), placed opposite the display wall (23) and accessible by an operator to take the ice-cream from the ice-cream tubs (200),

and wherein on said sliding ice-cream drawers (30), on the operating side (24), handles (31) are fixed for the extraction of the sliding ice-cream drawers (30) from the operating side (24) toward the operator.

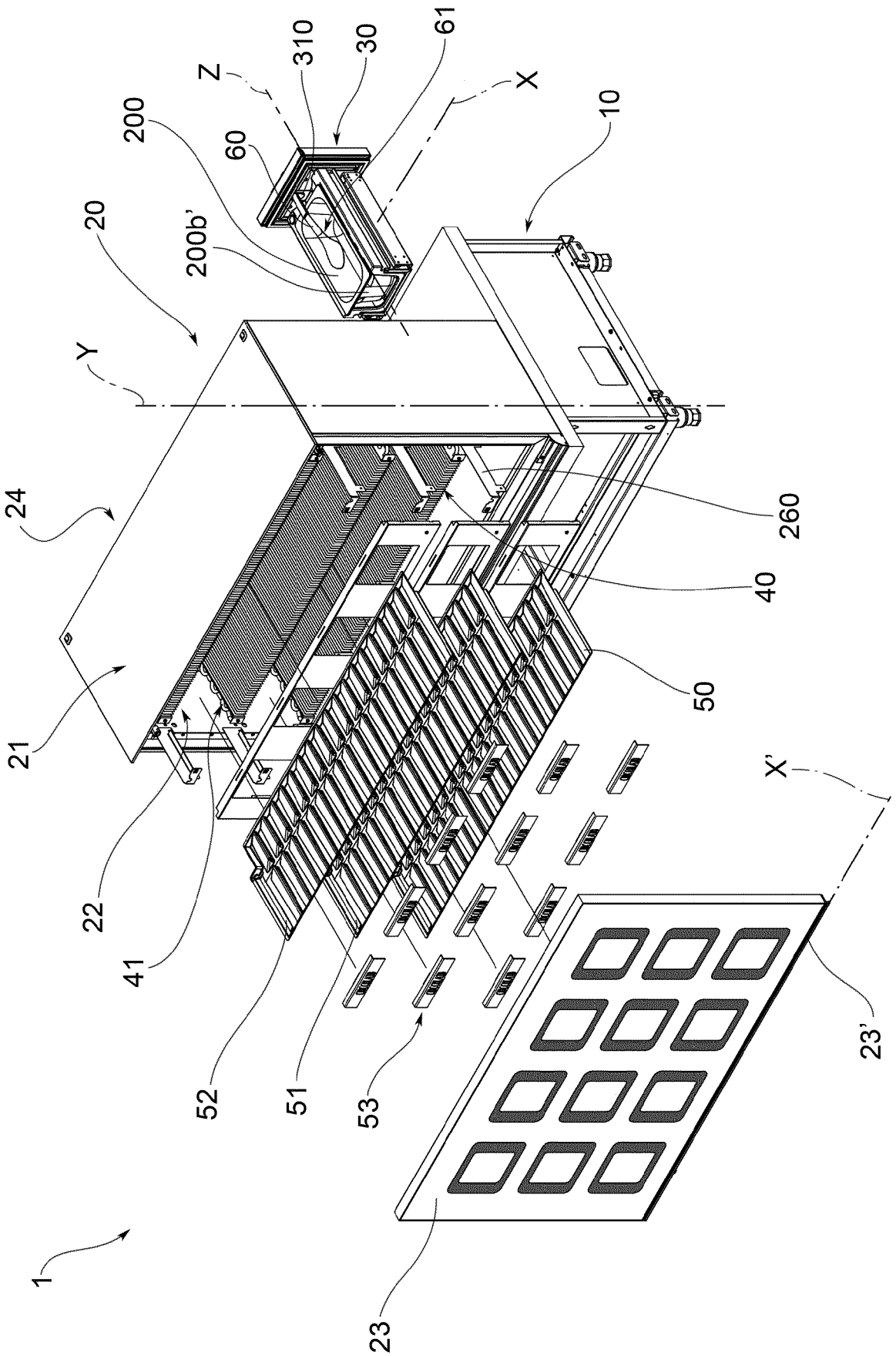
11. Ice-cream display cabinet (1) according to claim 10, wherein the display wall (23), at a perimeter side (23'), thereof is connected to the refrigerable display cabinet (20) in a manner rotatable about an axis of rotation (X'), so as to be rotated to allow access to the inner compartment (22) from the display side, by an operator.

12. Ice-cream drawer (30), suitable to be inserted and extracted from an ice-cream display cabinet for the sale of bulk ice-cream, comprising a refrigerable element (201) made at least partially in a heat-storing material, suitable to accumulate refrigerant thermal energy when the drawer is inserted in the ice-cream display cabinet and to give off refrigerant thermal energy (heat exchange) to the ice-cream when the drawer is extracted from the ice-cream display cabinet, said refrigerable element (201) comprising a tub seat (210) suitable to house a tub of ice-cream (200).

13. Ice-cream drawer (30) according to claim 12, in which the refrigerable element (201) is a container having an inner chamber (202) containing a refrigerable liquid or eutectic mixture.

14. Ice-cream drawer (30) according to claim 12 or 13, comprising a drawer frame (301) which supports the refrigerable element (201) and which is suitable to slide in the refrigerable display cabinet on runners (260).

15. Ice-cream drawer (30) according to claim 13 and 14, in which the refrigerable element (201) comprises structural container walls (201') in contact on one side with the inner chamber (202) and on the other side suitable to receive in contact the ice-cream tub (200) by means of a shaped coupling.


Z
310
30
61
X
200
60
10
20
200b'
Y
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260
40
50
21
X'
22
41
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51
53
23'
23
1

FIG.1

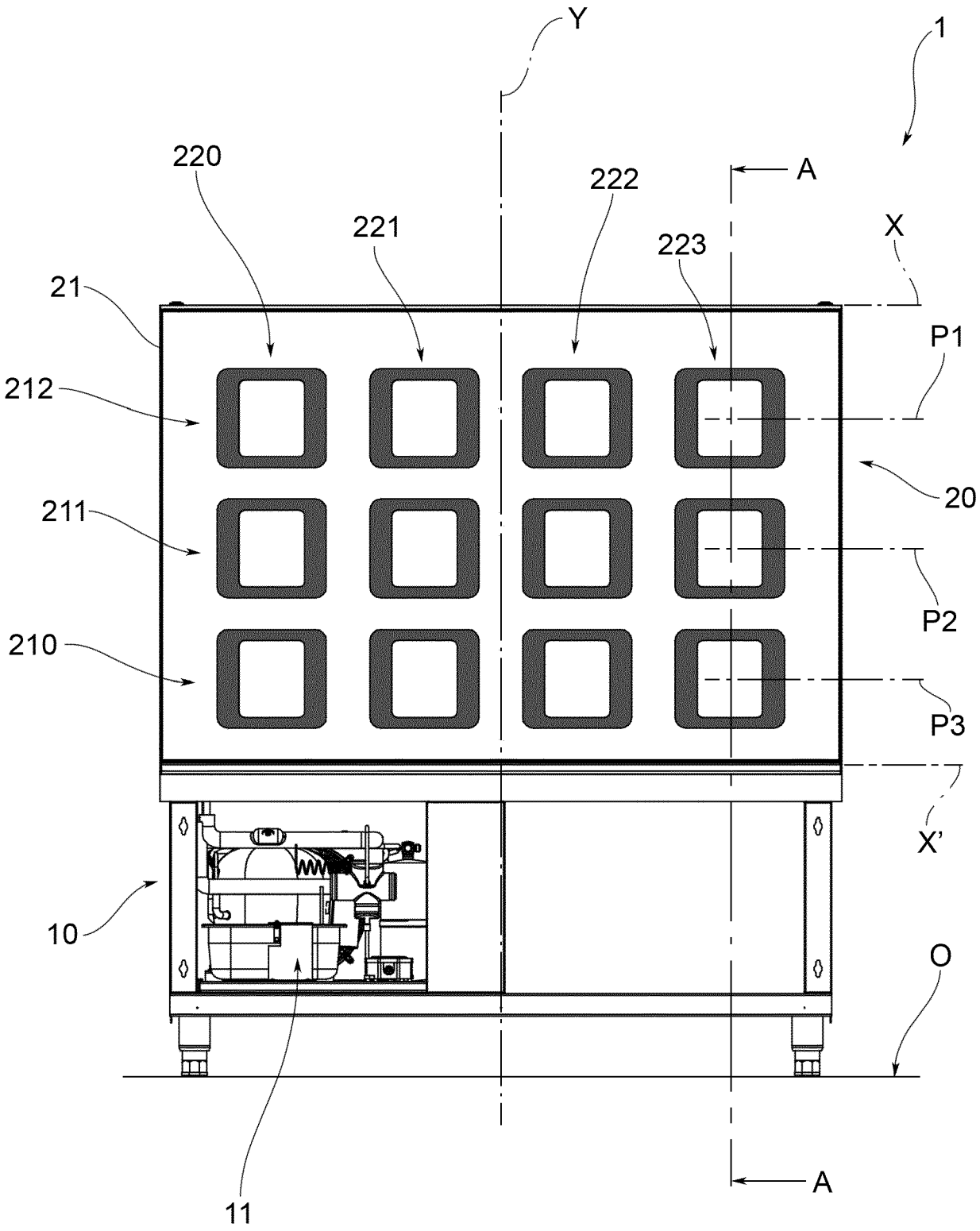


FIG.2

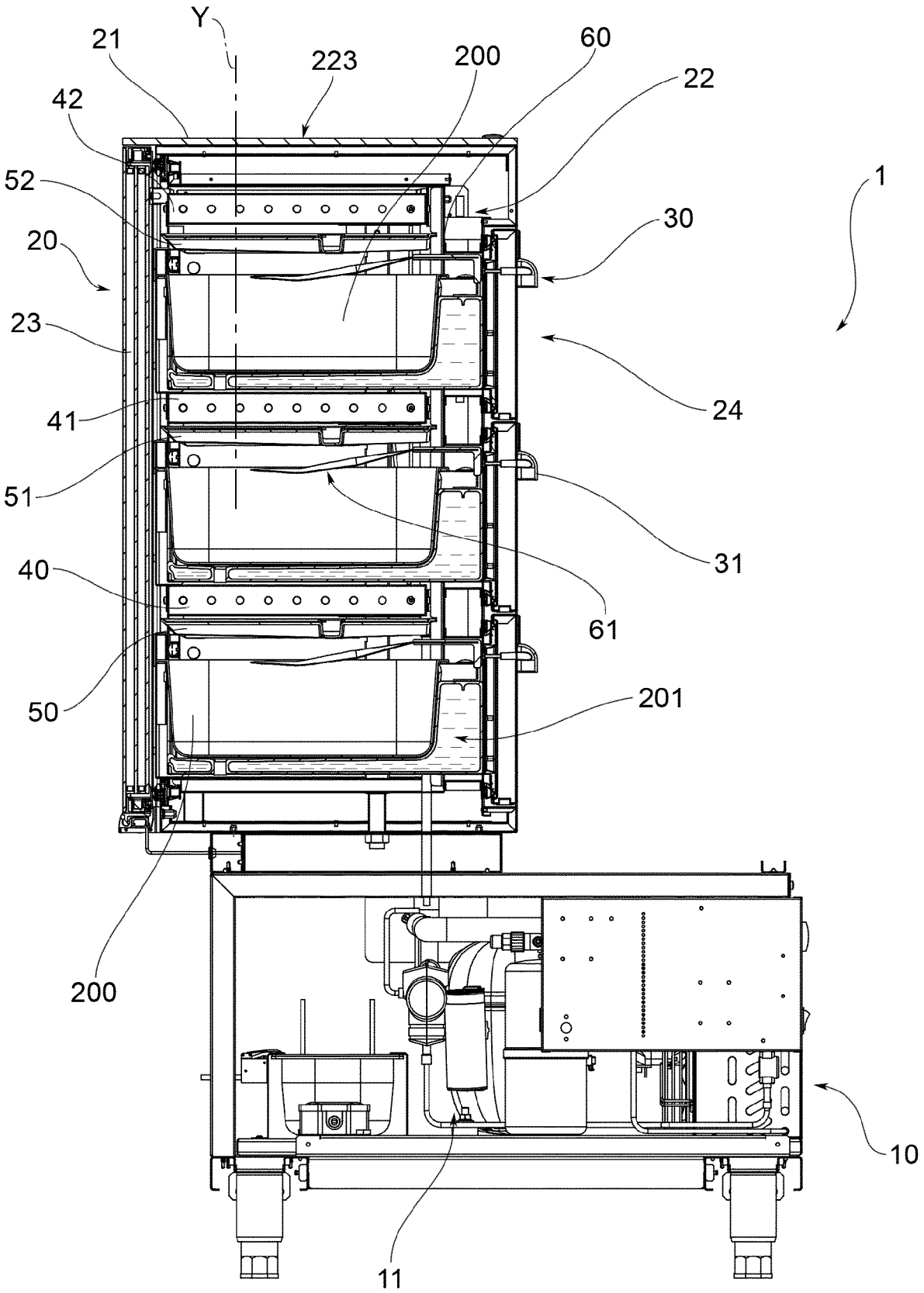
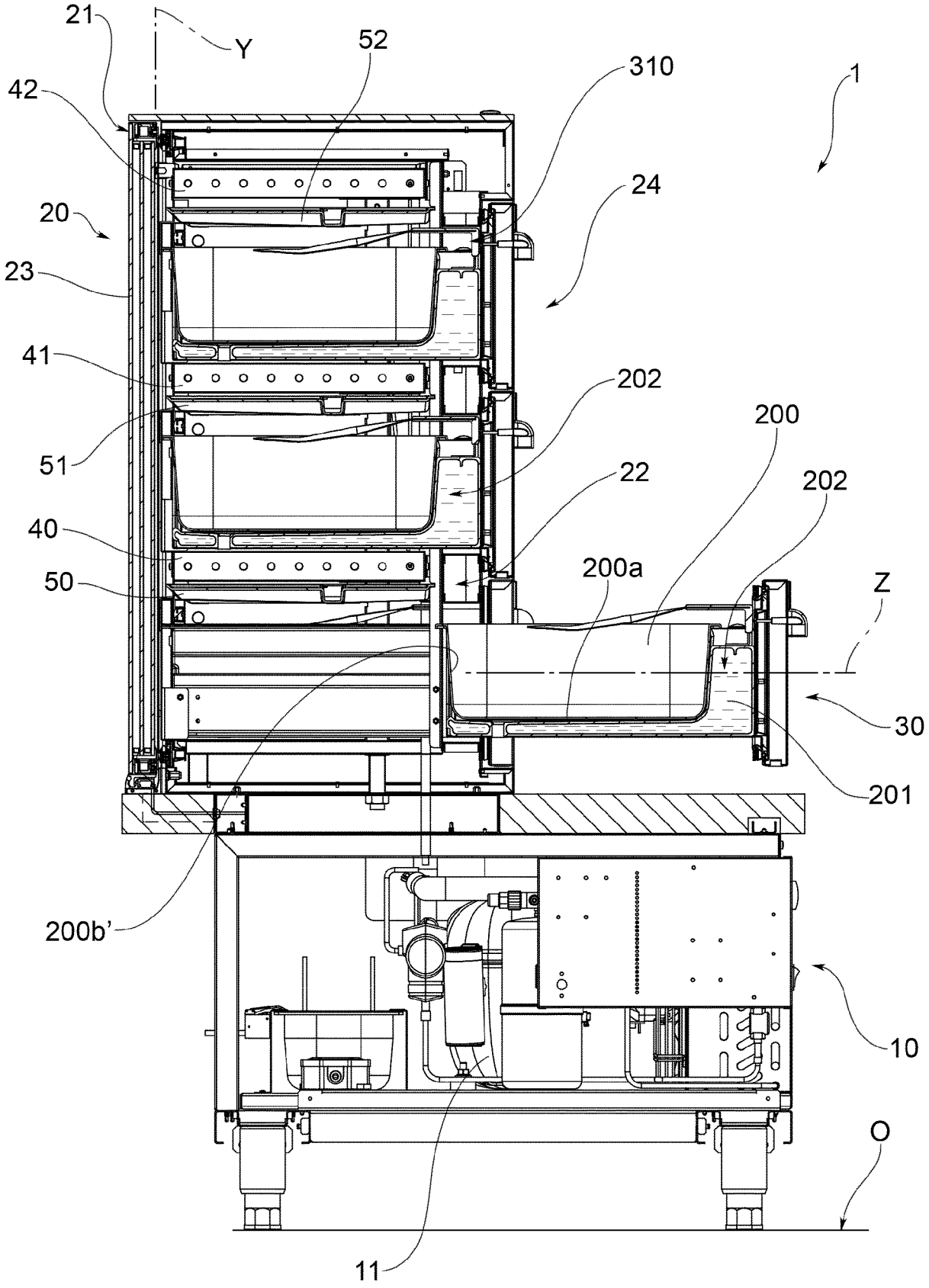


FIG.3


21
Y
52
310
1
42
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20
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41
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40
200a
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200b'
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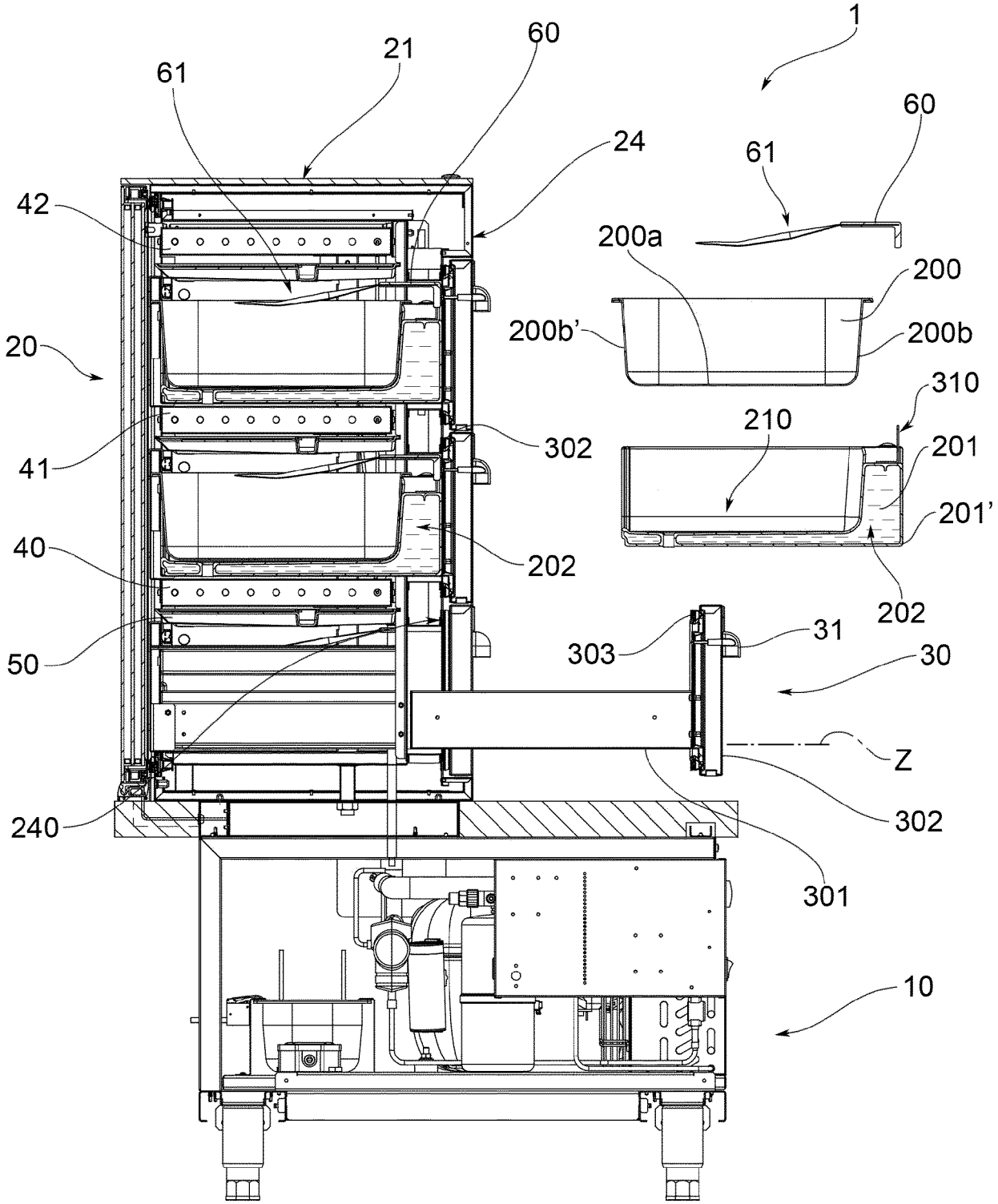
FIG.4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21
60
61
24
42
20
41
40
50
240
302
202
303
31
30
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301
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60
61
200a
200
200b'
200b
310
210
201
201'
202

FIG.5

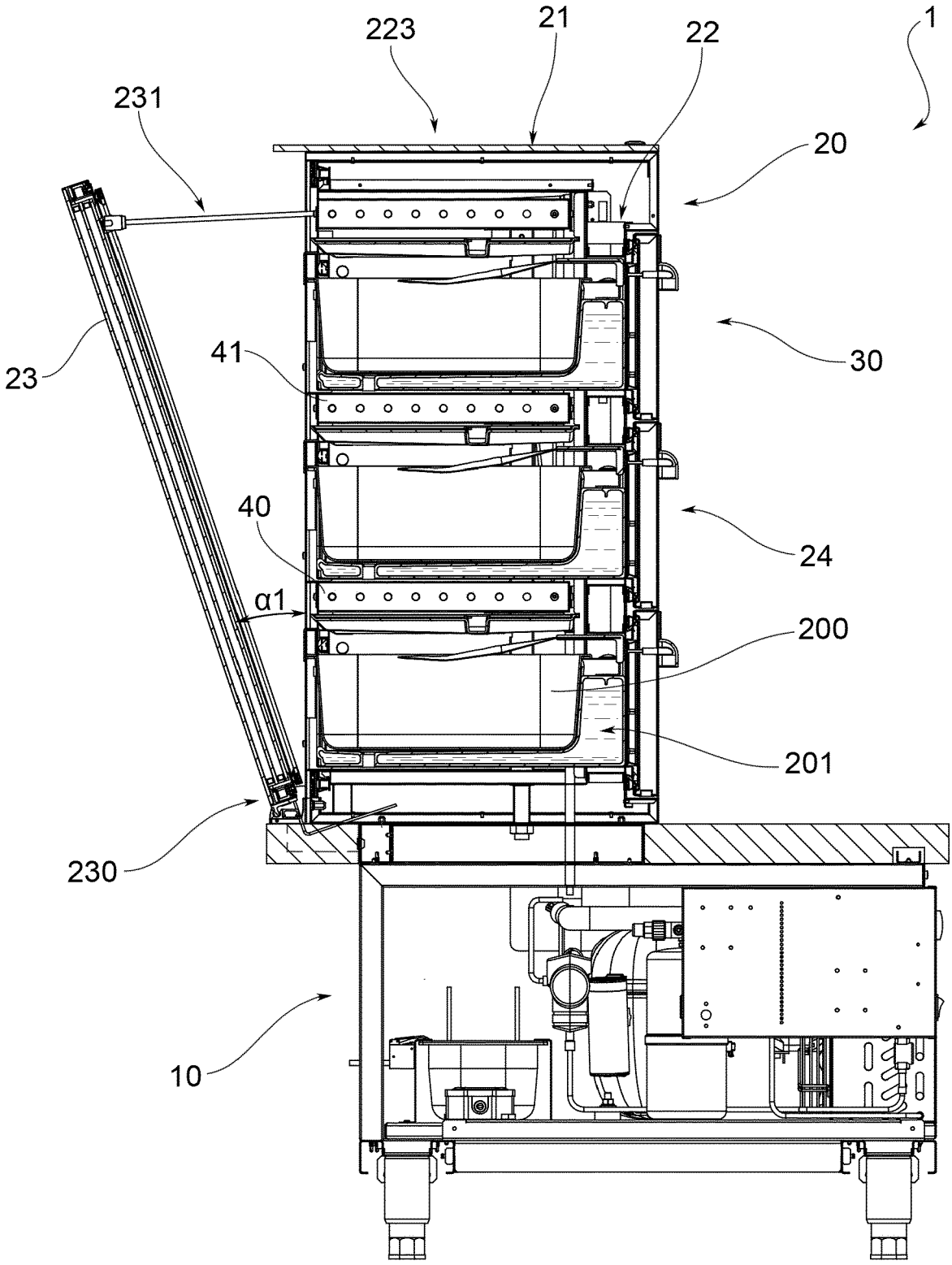

FIG.6

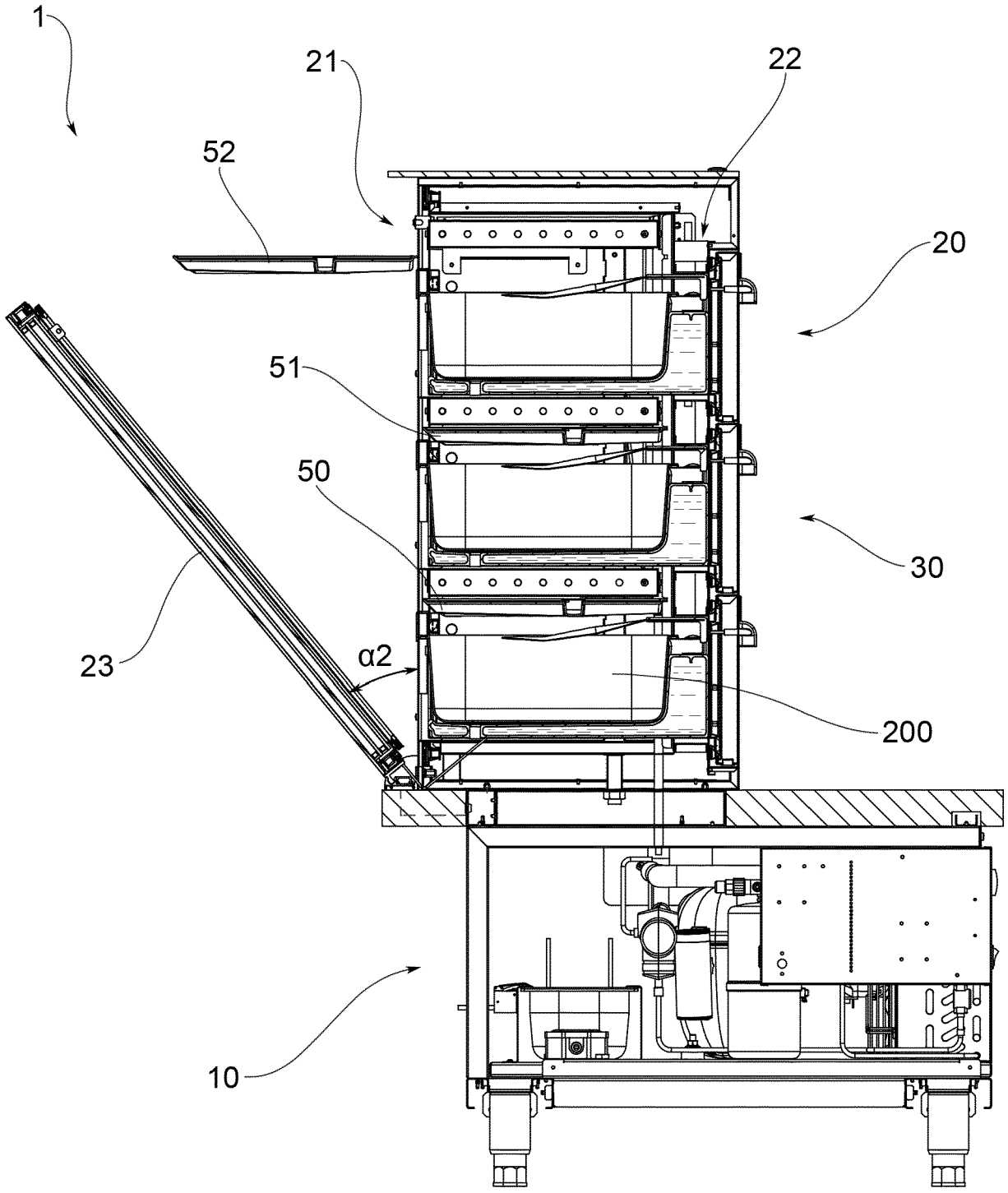

FIG.7

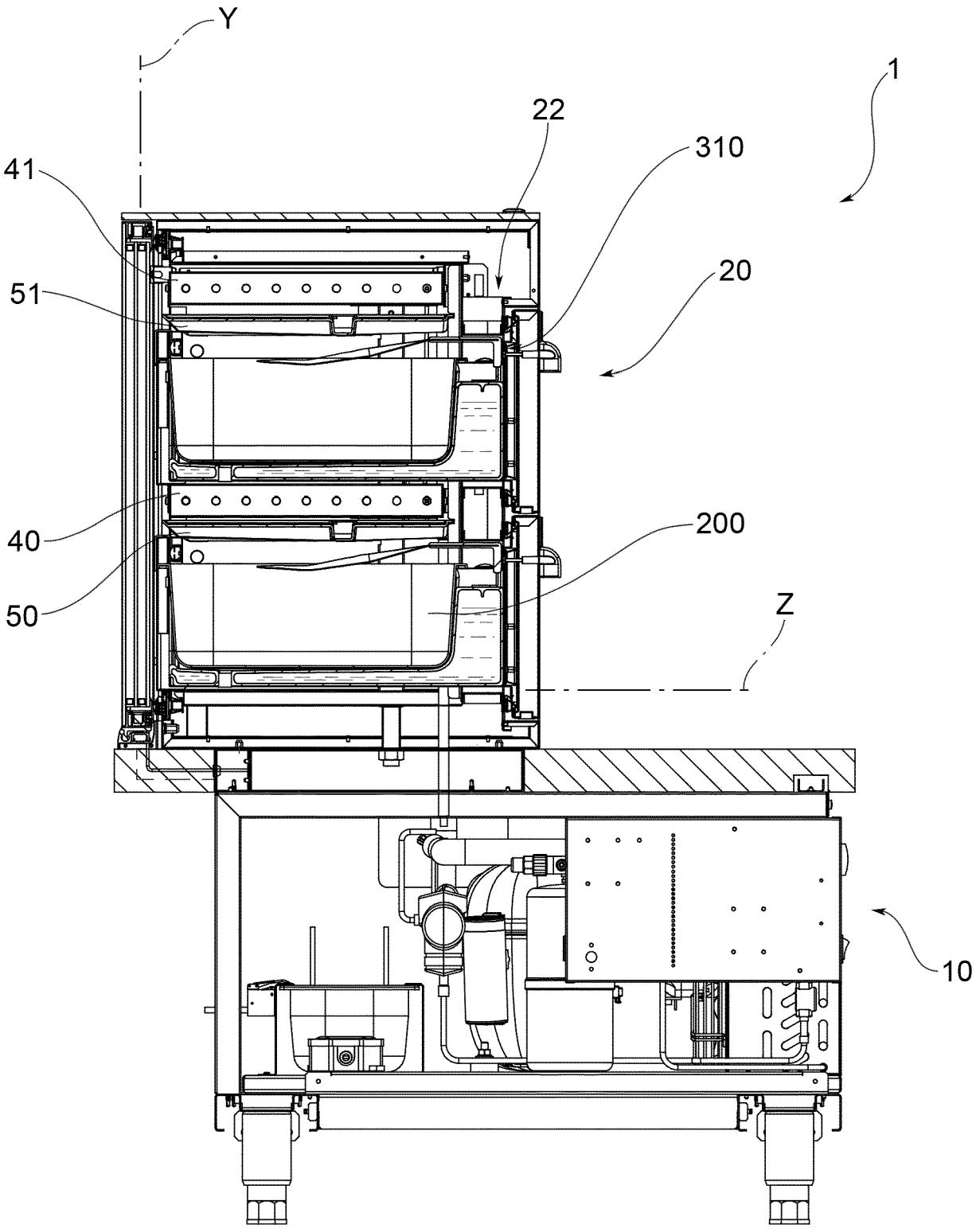

FIG.8

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European Patent Office
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EUROPEAN SEARCH REPORT

Application Number
EP 18 15 8406

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y	GB 2 028 480 A (GUINNESS SON & CO LTD; WATNEY MANN & TRUMAN BREWERS L) 5 March 1980 (1980-03-05) * column 1, line 28 - column 3, line 45; figures 1-3 *	1,3,4,7 2,5,6,8, 9	INV. F25D25/02 A47F3/04
A		10,11	
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X Y	WO 2012/069372 A2 (HW VERWALTUNGS GMBH [DE]; WALTER HUBERT ERIC [DE]) 31 May 2012 (2012-05-31) * the whole document *	12-15 2,5,6	
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	29 May 2018	Kohler, Pierre

CATEGORY OF CITED DOCUMENTS

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