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(54) **Refrigerated display Table**

Warentheke mit Kühlung

Etal réfrigéré

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(73) Proprietor: **Epta S.p.A.**
20138 Milano (IT)

(72) Inventor: **Giomo, Giuseppe**
45100 Rovigo (IT)

(74) Representative: **Pulieri, Gianluca Antonio et al**
Jacobacci & Partners S.p.A.
Via Berchet 9
35131 Padova (IT)

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Description

Field of application

[0001] Subject of the present invention is a refrigerated display table.

[0002] The refrigerated display table according to the invention can be used in particular to create show areas of elevated aesthetic standard, destined for example to launching new products or top-quality products, or creating areas requiring a great deal of flexibility at layout level.

State of the art

[0003] A refrigerated display table comprises a supporting columnar element, which acts as support base for resting on the ground, and a chest which defines a loading compartment for displaying products and has an enlarged plan section compared to the supporting element.

[0004] In the Figure 1 attached is schematically shown a refrigerated display table T of traditional type, where by B is indicated the supporting element and by C the display chest.

[0005] The chest C is connected at the top to the supporting element B in correspondence to a bottom portion. The loading compartment is delimited at the bottom by the above-mentioned bottom portion and around the perimeter by walls P in transparent material connected to the bottom.

[0006] The table T has a refrigerator circuit comprising at least a condenser (not shown), a compressor (not shown) and an evaporator E.

[0007] Traditionally, as shown in the Figure 1, the evaporator is arranged in the chest C, placed inside a technical space obtained in the bottom portion by means of a double bottom. Such technical space substantially extends over the entire bottom of the chest defining an hollow space for the circulation of air. The condenser and the compressor are on the other hand arranged inside the supporting element B.

[0008] The table T is provided with ventilating means (not shown), arranged in the proximity of the evaporator E on the bottom of the chest and suitable for producing a circulation of air affecting the evaporator E and the loading compartment, as indicated by the arrows shown in the figure 1. On top of the chest the circulation of air creates a curtain of cold air that isolates the loading compartment from the outside environment.

[0009] US 6412296 B1 discloses a refrigerated cabinet having a chest for displaying goods and a supporting element for the chest. The compressor and the condensing unit are placed inside the supporting element, while the evaporator and the ventilating unit are placed in the tank 14, inside a technical compartment for the circulation of the air defined between the bottom of the tank and the loading surface.

[0010] Generally, refrigerated display tables are used to create show areas of superior aesthetic standard, e.g., for displaying particular or elegant products. Compared to standard horizontal or vertical display tables, the display tables do in fact have a less-imposing structure, which allows the customer to focus greater attention on the products displayed in them. The column form of the supporting element, the prevalently horizontal extension of the chest and the use of perimeter walls made of transparent material reduce the visual impact of the unit structure, making it appear slimmer and lighter.

[0011] For some time now, the need has existed on the market to further accentuate the above aesthetic characteristics. In particular, the need exists to reduce the thickness of the bottom portion of the chest, so as to better highlight the loading compartment and the products displayed in it, without however negatively affecting the operation of the unit in terms of refrigerating capacity and efficiency.

Presentation of the invention

[0012] Consequently, object of the present invention is to eliminate the drawbacks of the above-mentioned state of the art, providing a refrigerated display table that can be provided with a chest with bottom portion having reduced thickness without negatively affecting the operation of the unit in terms of refrigerating capacity and efficiency.

[0013] A further object of the present invention is to provide a refrigerated display table that has a superior refrigerating efficiency.

[0014] A further object of the present invention is to provide a refrigerated display table having chest insulation with a more efficient air curtain.

[0015] A further object of the present invention is to provide a refrigerated display table that is easy and inexpensive to make.

Short description of the drawings

[0016] The technical characteristics of the invention, according to the above objects, are clearly identifiable from the contents of the claims shown below and the advantages of same will be more evident from the following detailed description, made with reference to the attached drawings, which represent one or more embodiments provided by way of example only and without any intention of being reductive, wherein:

- the Figure 1 shows a schematic partial-section view of a refrigerated display table of the traditional type;
- the Figure 2a shows a schematic section view of a refrigerated display table according to a preferred embodiment of the invention;
- the Figure 2b shows a schematic section view of a refrigerated display table according to an alternative embodiment of the invention;

- the Figure 3 shows a section view on a vertical plane of a refrigerated display table according to a preferred embodiment of the invention;
- the Figure 4 shows a view from above of the display table illustrated in the Figure 3, with some parts eliminated to better highlight others;
- the Figures from 5 to 7 show the display table of Figure 3 in three different inclination adjustment positions of the chest;
- the Figure 8 shows a perspective view of the refrigerated display table illustrated in the Figure 3;
- the Figure 9 shows a side view of two display tables according to the invention side by side to form a single display area;
- the Figure 10 shows a detail of the Figure 3 relating to a first technical space for housing the evaporator.

Detailed description

[0017] With reference to the attached drawings generally indicated by 1 is a refrigerated display table according to the invention.

[0018] Here and in the rest of the description and the claims, reference is made to the refrigerated table 1 in conditions of use. In this sense, the references shall be understood to a lower or higher position, or to a horizontal or vertical orientation.

[0019] According to a general embodiment of the invention, the refrigerated display table comprises a supporting columnar element 10 for resting on the ground G and a chest 20, which is connected at the top to the supporting element 10 in correspondence to a bottom portion 21.

[0020] The chest 20 defines a loading compartment 20a for displaying products by means of a plurality of perimeter walls 29 extending from the bottom portion 21. Preferably, such perimeter walls 29 are made of transparent material to reduce the visual impact of the chest and highlight the products placed in the loading compartment 20a.

[0021] The chest 20 has a plan section enlarged with respect to the supporting element 10.

[0022] The refrigerated table 1 has a refrigerating circuit comprising at least a condenser 30, a compressor 40 and an evaporator 50 and ventilating means 60 to produce a circulation of air affecting the evaporator 50 and the chest 20.

[0023] According to an essential aspect of the present invention, the refrigerating circuit 30, 40 and 50 is completely housed inside the supporting columnar element 10, below the bottom portion 21 of the chest 20.

[0024] Consequently, according to the invention, unlike what is envisaged in the prior art solutions, the evaporator is no longer arranged inside the chest, but is placed together with the condenser and the compressor inside the supporting element 10.

[0025] This allows reducing the volume of the chest dedicated to non-display purposes, i.e. to technical purposes related to the operation of the display table. It is therefore possible to reduce the thickness of the bottom portion of the chest without by so doing affecting the operation of the refrigerated table in terms of refrigerating capacity.

[0026] Advantageously, as will be explained later on, thanks to the present invention the technical volume of the chest dedicated to technical purposes, and therefore subtracted from display purposes, can be essentially restricted to the volume needed to create adequate channelling of the air circulating inside the chest.

[0027] In particular, as will be resumed later on, the height (or thickness) of the bottom portion can be reduced by reducing the height (or thickness) of the hollow space obtained by means of a double bottom in the bottom portion for the circulation of the air. in fact, unlike the prior art solutions, this hollow space has no longer to house the evaporator.

[0028] Preferably, the evaporator 50 is positioned directly below the bottom portion 21 of the chest 20. This way, as will be resumed later on, the path of the circulating air is made simpler.

[0029] Preferably, the evaporator 50 is positioned above the condenser 30 and/or the compressor 40.

[0030] The positioning of the evaporator above at least one of the other two more cumbersome components of the refrigerating circuit permits exploiting the height extension of the supporting columnar element 10. This way, the overall plan dimensions of the supporting element are not increased.

[0031] Advantageously, the inner space of the supporting element is divided into at least two technical spaces: a first technical space indicated by 11, wherein the evaporator 20is housed, and a second technical space, indicated by 12, wherein at least the condenser 30 and the compressor 40 is housed.

[0032] The two technical spaces 11 and 13 are separated by a dividing wall 13, preferably made of heat-insulating material, suitable for preventing heat exchanges between the condenser and the evaporator. As insulating materials can be used in particular silicone dioxide aerogel, which ensures high performances in terms of insulation with reduced thicknesses.

[0033] According to a preferred embodiment, shown in particular in the Figure 3, the two technical spaces are superimposed the one on the other, with the first technical space 11 arranged above the second technical space 12.

[0034] Other spatial layouts of the two technical spaces can however be envisaged, e.g. positioned side by side. Three or more distinct technical spaces can also be envisaged, one for the evaporator, one for the compressor and one for the condenser. Such three technical spaces can be positioned all on the same plane, or else superimposed on one another according to various spatial layouts.

[0035] Advantageously, the evaporator 50 is of the finned type.

[0036] The positioning of the evaporator inside the sup-

porting element 10 allows operating with less restrictive restraints in terms of overall dimensions with respect to prior art solutions.

[0037] In particular, a compact type evaporator can be used.

[0038] By the expression "compact evaporator" is meant an evaporator without a preponderant development dimension. A compact evaporator is unlike evaporators used in prior art refrigerated tables, which are thin and elongated, designed to be placed on the bottom of the chest and called "flat evaporators".

[0039] As is known, heat exchange surface being equal, the efficiency of a "compact evaporator" is superior to that of a "flat evaporator". The movement of the evaporator from the chest to the supporting element therefore allows adopting plant engineering solutions that considerably upgrade the efficiency of the refrigerating system.

[0040] In particular, with reference to the Figure 4, by compact evaporator is meant an evaporator with flow area Af having a ratio R between the width La and length Lu, R = La/Lu between 0.5 and 1.5.

[0041] By flow area is meant the area orthogonal to the flow of air hitting the evaporator and which crosses it parallel to the heat exchange fins. The reference to the length Lu and to the width La of the flow area Af is given by the dimensions of the chest in length and width.

[0042] By "compact evaporator" can also be meant in particular an evaporator wherein the ratio between the two dimensions chosen between length Lu, width La and height H is not above 3. By height H is meant the dimension of the evaporator orthogonal to the flow area Af.

[0043] An example of refrigerated table according to the invention envisages a chest 20 having a length Lu' of 1250 mm and a width La' of 1000 mm and a supporting columnar element 10 having a square external section with side of 400 mm and height of 580 mm. The supporting element has four adjusting feet which allow lifting the supporting columnar element off the ground by at least 80 mm and at most 230 mm. The evaporator has a width La of 350 mm, a length Lu of 260 mm and a height H of 140 mm.

[0044] Advantageously, as already previously said, the chest 20 has an air channelling system to allow the circulation of air inside.

[0045] Preferably, the channelling system is of the double air supply type, as shown in the Figure 2a and described in detail later on. Alternatively, the channelling system can also be of the single supply type, as shown in the Figure 2b.

[0046] As can be seen in particular in the Figures 2a, 2b or 3, the chest 20 may have a double bottom 21a, obtained in the bottom portion 21. Such double bottom 21a defines an hollow space 23 for the circulation of air.

[0047] Preferably, above the double bottom 21a a product supporting grid 21b is positioned. The grid 21b is slightly raised with respect to the double bottom 21a so as to create a second hollow space 33 which as will be further explained later facilitates the return of the air to the evaporator and the closing of the air circulation circuit when the chest is filled with products.

[0048] The hollow space 23 communicates directly with the loading compartment 20a of the chest 20 by means of at least two slits 71, 72, which can both be raised with respect to the bottom portion (see Figure 3) or one can be raised and one placed level with the bottom (see Figure 2a, first slit 71 and second slit 72 respectively).

[0049] Preferably, the hollow space 23 substantially covers the entire bottom of the chest.

[0050] Advantageously, the hollow space 23 extends to at least one of the perimeter walls 29 with a first vertical branch 23a' delimited by an inner screen wall 22a (preferably made of transparent material), faced and distanced with respect to one of the perimeter walls 29a. Such vertical branch communicates with the loading compartment through the first slit 71.

[0051] According to the preferred embodiment shown in particular in the Figure 3, the hollow space 23 extends to two perimeter walls 29a and 29b respectively with a first and a second vertical branch 23a' and 23a". Similarly to the first branch, the second vertical branch 23a" is also delimited by an inner screen wall 22b (preferably made of transparent material), faced and distanced with respect to a second perimeter wall 29b. Preferably, the two vertical branches are made in the chest 20 in opposite positions. The second branch 23a" communicates with the loading compartment 20a by means of the second slit 72.

[0052] Operatively, as will be taken up again later on, in the embodiment shown in the Figure 3, the two vertical branches 23a' and 23a" act as supply channels for the cold air from the evaporator to the loading compartment 20a.

[0053] Advantageously, in correspondence to the top of the two vertical branches 23a' and 23a" both the perimeter walls 29a and 29b, and the inner screen walls 22a and 22b define the two slits 71, 72 by means of extremity portions turned towards the inside of the chest and shaped so as to impress on the flow of air a movement as laminar as possible in order to contrast the natural phenomenon of the heavier cold air dropping downwards.

[0054] According to the alternative embodiment shown in the Figure 2b, only the vertical branch 23a' with the relevant first slit 71 acts as a supply channel, while the slit 72 defines one of the air return openings.

[0055] As can be seen in particular in the Figures 2 and 4, in correspondence to the supporting element 10 on the bottom portion 21 at least one through opening 24 is realised which places in communication the chest 20 with the first technical space 11 wherein is placed the evaporator 50.

[0056] Advantageously, the table 1 comprises at least one deflector element 25, 26 arranged in correspondence to the said at least one through opening 24, such deflector element 25, 26 divides the hollow space 23 into

a first 23' and into a second sector 23", each communicating with the loading compartment 20a by means of one of the above slits 71, 72.

[0057] More in particular, as can be seen for example in the Figures 3 and 10, the deflector element 25, 26 extends inside the first technical space 11 to delimit:

- a first duct 27, wherein is at least partially housed the evaporator 50 and which places in direct communication the loading compartment 10a with the first technical space; and
- at least a second duct 28a,28b, which places in communication the first duct 27 with the first sector 23' of the hollow space 23.

[0058] According to the preferred embodiment described in the Figures 3 and 10, the refrigerated table 1 comprises two deflector elements 25, 26 arranged in correspondence to the opening 24 and distanced the one from the other. Such deflector elements 25 and 26, made up for example of two metal plates, extend vertically from the double bottom 21a inside the first technical space 11.

[0059] The two deflectors 25, 26 divide the hollow space 23 in the above first 23' and second sector 23", each of which is communicating with the loading compartment 20a by means of one of the above slits 71, 72.

[0060] The two deflectors 25, 26 delimit three ducts in the first technical space 11: the above first duct 27, preferably centred with respect to the opening 24 and comprised between the two deflector elements; and two second ducts 28a and 28b, alongside the first duct 27 in opposite positions, each between a deflector and a portion of perimeter wall of the supporting element 10. The evaporator 50, and in particular the finned heat exchange pack, is arranged substantially inside the above first vertical duct 27. The first duct 27 places the loading compartment 20a in communication with the evaporator 50, while each second duct 28a and 28b places the first duct 27 in communication with one of the two sectors 23' and 23" of the hollow space 23.

[0061] Advantageously, the ventilating means comprise at least a blower 60 arranged in the proximity of the opening 24.

[0062] As can be seen in particular in the Figure 10, the blower 60 is arranged in correspondence to the first duct 27, above the evaporator 50. In particular, the blower 60 can be placed inside the double bottom 21a or (embodiment not shown) completely outside the bottom portion of the chest 20 and therefore inside the supporting element 10, fastened below to the same bottom portion 21.

[0063] Advantageously, to reduce the overall dimensions of the single blower and thus prevent this becoming a restrictive restraint on the height (or thickness) of the hollow space, two or more blowers of smaller size can be adopted.

[0064] Operatively, making reference to the embodiment shown in the Figures 2a or 10, the blower 60 generates an air flow from the loading compartment 20a towards the evaporator 50 through the first duct 27. The flow of cool air leaves the evaporator and rises through the two second ducts 28a and 28b towards the first and the second sectors 23' and 23" respectively of the hollow space and then flows through the respective slits 71, 72 into the loading compartment 20a.

[0065] The two flows of cold air coming from the slits thus create two curtains of cold air that isolate the loading compartment 20a from the outside environment and meet above the opening 24. The creation of two air curtains allows considerably improving the heat insulation efficiency compared to the abovementioned prior art solution. As is known, the efficiency of an air curtain increases as its length decreases.

[0066] According to the preferred embodiment described in the Figures 2b, the refrigerated table 1 comprises a single deflector element 25. Inside the first technical space 11 two ducts are thus delimited: a first duct 27 and a second duct 28a that places in communication the first duct 27 with the first sector 23' of the hollow space 23. The second sector 23" of the hollow space 23 instead communicates directly with the opening 24. The first sector 23' which includes the first vertical branch 23a' operates under pressure (supply), while the second sector 23" operates in suction (return).

[0067] More in detail, as shown in the Figure 2b, the blower 60 generates a flow of air from the loading compartment 20a towards the evaporator 50 through the first duct 27. From the loading compartment the air is drawn into the first duct 27 also through the second sector 23". The flow of cooled air leaves the evaporator rising back through the second duct 28a only towards the first sector 23' of the hollow space to then flow through the respective first slit 71 into the loading compartment 20a. The flow of cold air coming from the first slit thus creates a single curtain of cold air which isolates the loading compartment 20a from the outside environment. Part of the cold air returns to the evaporator through the opening 24, while the remaining part (prevented for example by the products present in the chest) returns to the evaporator through the second sector 23" entering through the second slit 72.

[0068] Preferably, the chest 20 is integrally associated with the supporting columnar element 10, so as to form a single body. This solution permits simplifying air channelling, considering that no connections of the mobile type have to be envisaged between the chest and the supporting columnar element.

[0069] According to the embodiment described in particular in the Figures from 5 to 7, the table 1 comprises mobile feet 14 associated with the supporting element 10 to regulate the height and/or the inclination of the chest 20 with respect to the ground G.

[0070] More in detail, the above mobile feet 14 are associated in sliding manner with guides 15 made on the supporting element 10. As shown in the Figures 9, if the supporting columnar element 10 is made with a square-

section box body, four feet can be envisaged for example arranged in correspondence to the four corners of the box body.

[0071] Preferably the mobile feet 14 are adjustable independently the one from the other.

[0072] Other systems can be envisaged for adjusting the height and/or the inclination of the chest, which envisage, for example, the independent adjustment of the chest with respect to the supporting element.

[0073] According to the preferred embodiment shown in particular in the Figure 3, the chest 20 is fastened to the supporting columnar element 10 with the bottom portion 21 pre-inclined by an inclination angle α predefined with respect to a reference plane m orthogonal with respect to a main extension axis x of the supporting columnar element 10. By main axis x is meant the axis along which the supporting columnar element extends in height.

[0074] Operatively, the inclination of the chest 20 can be increased or decreased with respect to the ground G, by suitably regulating the position of the feet 14.

[0075] More in detail, the compressor 40 is installed pre-inclined with respect to the above reference plane m with a predefined pre-inclination angle β, opposite with respect to the inclination angle α of the chest 20. Preferably the two angles α and β have the same amplitude.

[0076] As is known, the compressors normally used in refrigerated counters (of the oil sump type) must be installed within specific inclination ranges to be able to operate correctly. Thanks to the opposite pre-inclination of the compressor with respect to the chest, the chest can be inclined and with this the supporting columnar element (integral with the chest) beyond the maximum inclination angles allowed for the compressor.

[0077] Imagining that the maximum acceptable inclination angle for the compressor is 3°, the chest is made pre-inclined with respect to the supporting element by 3° in the opposite direction (Figure 5). By suitably regulating the feet it is still possible to increase the inclination of the chest by another 6°. With an increase of just 3° of inclination, the compressor is in fact horizontal (Figure 6), while with an increase of 6° the compressor reaches maximum allowed inclination (Figure 7) in the opposite direction with respect to the initial one.

[0078] As shown in the Figure 9, the refrigerated display table 1 according to the invention is ideal for use as a modular element for the creation of extensive display areas. Thanks to the mobile feet, the height and the inclination of each single module 1' and 1" can be adjusted so as to create a single display table.

[0079] The invention allows obtaining numerous advantages in part already described.

[0080] The refrigerated display table according to the invention can be provided with a chest with bottom of reduced thickness without affecting the operation of the unit in terms of refrigerating capacity and efficiency.

[0081] Thanks to the positioning of the evaporator inside the supporting element, an evaporator of the compact type can be adopted, thereby considerably improving the efficiency of the refrigerating system.

[0082] Thanks to the invention and to the air channelling adopted in the preferred embodiment shown in the Figure 3, the air curtain can be split into two, improving the efficiency of the heat insulation.

[0083] The invention thus conceived therefore achieves the set objects.

[0084] Obviously, in its practical embodiment, it can also take on forms and configurations different to those shown above without, because of this, exiting from the present protection scope.

[0085] Furthermore, all the parts can be replaced by technically equivalent elements and the dimensions, the shapes and the materials used can be any according to requirements.

Claims

1. Refrigerated display table comprising:

   - a supporting columnar element (10) for resting on the ground (G);
   - a chest (20), connected at the top to said supporting element (10) in correspondence to a bottom portion (21) and defining a loading compartment (20a) for displaying products by means of a plurality of perimeter walls (29) extending from said bottom portion (21), said chest (20) having a double bottom (21a), made in said bottom portion (21), which delimits an hollow space (23) for the circulation of the air, said chest having an enlarged plan section with respect to said supporting element (10) ;
   - a refrigerating circuit comprising at least a condenser (30), a compressor (40) and an evaporator (50);
   - ventilating means (60) to generate a circulation of air affecting said evaporator (50) and said chest (20), **characterised in that** said refrigerating circuit (30, 40, 50) is completely housed inside said supporting columnar element (10) below the bottom portion (21) of said chest (20) so as to reduce the volume of the chest dedicated to non-display purposes.

2. Refrigerated table according to the claim 1, wherein said evaporator (50) is positioned directly below the bottom portion (21) of said chest (20).

3. Refrigerated table according to the claim 1 or 2, wherein said evaporator (50) is positioned above said condenser (30) and/or said compressor (40).

4. Refrigerated table according to one or more of the previous claims, wherein said evaporator (50) is an evaporator of the compact type.

5. Refrigerated table according to one or more of the previous claims, wherein the inner space of said supporting element (10) is divided into at least a first technical space (11), wherein the evaporator (20)is housed, and a second technical space (12), wherein at least the condenser (30) and/or at least the compressor (40) is housed, said table comprising at least a dividing wall (13) arranged between said two technical spaces (11, 12), preferably made of heat-insulating material.

6. Refrigerated table according to one or more of the previous claims, wherein said chest (20) has a double bottom (21a), made in said bottom portion (21) which delimits an hollow space (23) for the circulation of the air, said hollow space (23) communicating directly with the loading compartment (20a) of said chest (20) by means of at least two slits (71, 72).

7. Refrigerated table according to the previous claim, wherein said hollow space (23) extends to at least one of said perimeter walls (29) with a first vertical branch (23a'), which is delimited by at least an inner screen wall (22a,22b) faced and distanced from one of said perimeter walls (29) and communicates with said loading compartment through a first slit (71).

8. Refrigerated table according to the claim 6 or 7, wherein in correspondence to the supporting element (10) at least a through opening (24) is made on said bottom portion (21), said opening placing said chest (20) in direct communication with said first technical space (11).

9. Refrigerated table according to the claim 8, comprising at least a deflector element (25, 26) which is placed in correspondence to said at least one opening (24) and divides said hollow space (23) into a first (23') and into a second sector (23"), each sector communicating with said loading compartment (20a) through one of said slits (71, 72), said at least one deflector (25, 26) extending inside said first technical space (11) to delimit:

- a first duct (27), wherein said evaporator (50) is at least partially housed and which places the loading compartment (10a) in direct communication with said first technical space; and
- at least a second duct (28a,28b), which places said first duct (27) in communication with the first sector (23') of said hollow space (23).

10. Refrigerated table according to the claim 9, comprising two deflector elements (25, 26) which delimit two second ducts (28a,28b), separated by said first duct (27), each of said second duct placing said first duct (27) in communication with one of the two sectors (23',23") of said hollow space (23).

11. Refrigerated table according to the claim 9, wherein the second sector (23") of said hollow space (23) communicates directly with said opening (24).

12. Refrigerated table according to any one or more of the claims from 8 to 11, wherein said ventilating means comprise at least one blower (60) positioned in the proximity of said first opening, preferably in correspondence to said first duct (27).

13. Refrigerated table according to one or more of the previous claims, wherein said chest (20) is integrally associated with said supporting columnar element (10).

14. Refrigerated table according to the claim 13, comprising mobile feet (14) associated with said supporting element (10) to adjust the height and/or the inclination of said chest (20) with respect to the ground.

15. Refrigerated table according to the claim 14, wherein said mobile feet (14) are associated in a sliding manner with guides (15) made on said supporting element (10), preferably said feet (14) being adjustable independently the one from the other.

16. Refrigerated table according to one or more of the claims 13, 14 or 15, wherein the bottom portion (21) of said chest is inclined by a predefined angle of inclination (α) with respect to a horizontal plane of reference (m), orthogonal with respect to a main extension axis (x) of said supporting columnar element (10).

17. Refrigerated table according to the previous claim, wherein said compressor (40) is installed inclined with respect to said reference plane (m) by a predefined pre-inclination angle (β), opposite with respect to the inclination angle (α) of said chest (20), preferably said two angles (α,β) having the same amplitude.

Patentansprüche

1. Kühltheke umfassend:

- ein säulenförmiges Stützelement (10) für den Stand auf dem Boden (G),
- eine Truhe (20), die am oberen Ende des Stützelements (10) in Verbindung mit einem Bodenabschnitt (21) befestigt ist und einen Laderaum (20a) zur Schaustellung von Waren, der von einer Mehrzahl von Umfangswänden (29), die sich von dem Bodenabschnitt (21) erstrecken, umgrenzt ist, wobei die Truhe (20) einen Doppelboden (21a) aufweist, der in dem Bodenabschnitt (21) ausgebildet ist und einen Hohlraum

(23) für die Zirkulation der Luft bildet, wobei die Truhe einen vergrößerten Grundrissquerschnitt im Verhältnis zum Stützelement (10) aufweist,
- einen Kühlkreislauf umfassend wenigstens einen Kondensator (30), einen Kompressor (40) und einen Verdampfer (50),
- Belüftungsmittel (60), um eine Luftzirkulation, die auf den Verdampfer (50) und die Truhe (20) einwirkt, zu erzeugen,

dadurch gekennzeichnet,
dass der Kühlkreislauf (30, 40, 50) vollständig in dem säulenförmigen Stützelement (10) unterhalb des Bodenabschnitts (21) der Truhe (20) derart aufgenommen ist, dass das Volumen der Truhe, das nicht der Auslage dient, verringert wird.

2. Kühltheke gemäß Anspruch 1,
wobei der Verdampfer (50) direkt unterhalb des Bodenabschnitts (21) der Truhe (20) angeordnet ist.

3. Kühltheke nach einem der Ansprüche 1 oder 2,
wobei der Verdampfer (50) oberhalb des Kondensators (30) und/oder des Kompressors (40) angeordnet ist.

4. Kühltheke nach einem oder mehreren der vorangehenden Ansprüche,
wobei der Verdampfer (50) ein Kompaktverdampfer ist.

5. Kühltheke gemäß einem oder mehreren der vorangehenden Ansprüche,
wobei der Innenraum des Stützelements (10) in wenigstens einen ersten technischen Raum (11), in dem der Verdampfer (20) aufgenommen ist, und einen zweiten technischen Raum (12) aufgeteilt ist, in dem wenigstens der Kondensator (30) und/oder wenigstens der Kompressor (40) aufgenommen ist, wobei die Theke wenigstens eine Trennwand (13), die zwischen den zwei technischen Räumen (11, 12) angeordnet und vorzugsweise aus einem Wärmeisolierwerkstoff hergestellt ist, umfasst.

6. Kühltheke nach einem oder mehreren der vorangehenden Ansprüche,
wobei die Truhe (20) einen Doppelboden (21a) aufweist, der in dem Bodenabschnitt (21) ausgebildet ist und einen Hohlraum (23) für die Luftzirkulation umgrenzt, wobei der Hohlraum (23) unmittelbar mit dem Laderaum (20a) der Truhe (20) mittels wenigstens zweier Schlitze (71, 72) verbunden ist.

7. Kühltheke nach dem vorangehenden Anspruch,
wobei der Hohlraum (23) sich wenigstens bis zu einer der Umfangswände (29) mit einem ersten vertikalen Zweig (23a') erstreckt, der durch wenigstens eine Blendwand (22a, 22b) gebildet ist, die einer der Umfangswände (29) zugewandt und von dieser beabstandet ist und mit dem Laderaum durch einen ersten Schlitz (71) in Verbindung steht.

8. Kühltheke nach Anspruch 6 oder 7,
wobei in Verbindung mit dem Stützelement (10) wenigstens eine Durchgangsöffnung (24) in dem Bodenabschnitt (21) ausgebildet ist, wobei die Durchgangsöffnung die Truhe (20) unmittelbar mit dem ersten technischen Raum (11) verbindet.

9. Kühltheke gemäß Anspruch 8,
umfassend wenigstens ein Leitelement (25, 26), das in Verbindung mit der wenigstens einen Öffnung (24) angeordnet ist und den Hohlraum (23) in einen ersten (23') und einen zweiten Bereich (23") unterteilt, wobei jeder Bereich mit dem Laderaum (20a) durch einen der Schlitze (71, 72) in Verbindung steht, wobei das wenigstens eine Leitelement (25, 26) sich von der Innenseite des ersten technischen Raums (11) erstreckt, um

- einen ersten Anschluss (27) zu bilden, in dem der Verdampfer (50) wenigstens teilweise aufgenommen ist und der den Laderaum (10a) unmittelbar mit dem ersten technischen Raum verbindet, und
- wenigstens einen zweiten Anschluss (28a, 28b), der den ersten Anschluss (27) mit dem ersten Bereich (23') des Hohlraums (23) verbindet.

10. Kühltheke gemäß Anspruch 9,
umfassend zwei Leitelemente (25, 26), die zwei zweiten Anschlüsse (28a, 28b) bilden, die durch den ersten Anschluss (27) voneinander getrennt sind, wobei jeder zweite Anschluss den ersten Anschluss (27) mit einem der zwei Bereiche (23', 23") des Hohlraums (23) verbindet.

11. Kühltheke gemäß Anspruch 9,
wobei der zweite Bereich (23") des Hohlraums (23) unmittelbar mit der Öffnung (24) verbunden ist.

12. Kühltheke nach einem oder mehreren der vorangehenden Ansprüche 8 bis 11,
wobei die Belüftungsmittel wenigstens ein Gebläse (6) umfassen, das in der Nähe der ersten Öffnung und vorzugsweise in Verbindung mit dem ersten Anschluss (27) angeordnet ist.

13. Kühltheke nach einem oder mehreren der vorangehenden Ansprüche,
wobei die Truhe (20) mit dem säulenförmigen Stützelement (10) einstückig ausgebildet ist.

14. Kühltheke gemäß Anspruch 13,
umfassend bewegliche Füße (14), die mit dem Stüt-

zelement (10) verbunden sind, um die Höhe und/oder die Neigung der Truhe (20) zum Boden einzustellen.

15. Kühltheke gemäß Anspruch 14, wobei die beweglichen Füße (14) gleitend mit Führungen (15), die an dem Stützelement (10) ausgebildet sind, verbunden sind, wobei die Füße (14) vorzugsweise unabhängig voneinander einstellbar sind.

16. Kühltheke nach einem oder mehreren der Ansprüche 13, 14 oder 15, wobei der Bodenabschnitt (21) der Truhe mit einem vorbestimmten Neigungswinkel (α) zu einer horizontalen Bezugsebene (m) und orthogonal zu einer Haupterstreckungsachse (x) des säulenförmigen Stützelements (10) geneigt angeordnet ist.

17. Kühltheke nach dem vorangehenden Anspruch, wobei der Kompressor (40) zu der Bezugsebene (m) mit einem vorbestimmten im Voraus eingestellten Neigungswinkel (β) schräg installiert ist, der zu dem Neigungswinkel (α) der Truhe (20) entgegengesetzt ausgerichtet ist und wobei die zwei Winkel (α, β) vorzugsweise die gleiche Größe aufweisen.

Revendications

1. Étal réfrigéré comprenant :

- un élément colonnaire de support (10) destiné à reposer sur le sol (G) ;
- un coffre (20), relié à la partie supérieure dudit élément de support (10) en correspondance avec une partie inférieure (21), et définissant un compartiment de chargement (20a) pour exposer des produits au moyen d'une pluralité de parois périphériques (29) s'étendant à partir de ladite partie inférieure (21), ledit coffre (20) ayant un double fond (21a), réalisé dans ladite partie inférieure (21), qui délimite un espace creux (23) pour la circulation de l'air, ledit coffre ayant une section en plan élargie par rapport audit élément de support (10) ;
- un circuit réfrigérant comprenant au moins un condensateur (30), un compresseur (40) et un évaporateur (50) ;
- des moyens de ventilation (60) pour générer une circulation d'air affectant ledit évaporateur (50) et ledit coffre (20), **caractérisé en ce que** ledit circuit réfrigérant (30, 40, 50) est logé complètement à l'intérieur dudit élément colonnaire de support (10) en dessous de la partie inférieure (21) dudit coffre (20) de sorte à réduire le volume du coffre dédié à des fins de non-exposition.

2. Étal réfrigéré selon la revendication 1, dans lequel ledit évaporateur (50) est positionné directement en dessous de la partie inférieure (21) dudit coffre (20).

3. Étal réfrigéré selon la revendication 1 ou 2, dans lequel ledit évaporateur (50) est positionné au-dessus dudit condensateur (30) et/ou dudit compresseur (40).

4. Étal réfrigéré selon une ou plusieurs des revendications précédentes, dans lequel ledit évaporateur (50) est un évaporateur du type compact.

5. Étal réfrigéré selon une ou plusieurs des revendications précédentes, dans lequel l'espace interne dudit élément de support (10) est divisé en au moins un premier espace technique (11), dans lequel est logé l'évaporateur (20), et un second espace technique (12), dans lequel est logé au moins le condensateur (30) et/ou au moins le compresseur (40), ledit étal comprenant au moins une paroi de séparation (13) agencée entre lesdits deux espaces techniques (11, 12), de préférence constituée de matériau thermoisolant.

6. Étal réfrigéré selon une ou plusieurs des revendications précédentes, dans lequel ledit coffre (20) a un double fond (21a), réalisé dans ladite partie inférieure (21) qui délimite un espace creux (23) pour la circulation de l'air, ledit espace creux (23) communiquant directement avec le compartiment de chargement (20a) dudit coffre (20) au moyen d'au moins deux fentes (71, 72).

7. Étal réfrigéré selon la revendication précédente, dans lequel ledit espace creux (23) s'étend vers au moins l'une desdites parois périphériques (29) avec une première ramification verticale (23a'), qui est délimitée par au moins une paroi écran interne (22a, 22b) faisant face et à distance de l'une desdites parois périphériques (29) et communique avec ledit compartiment de chargement à travers une première fente (71).

8. Étal réfrigéré selon la revendication 6 ou 7, dans lequel en correspondance avec l'élément de support (10), au moins une ouverture traversante (24) est réalisée sur ladite partie inférieure (21), ladite ouverture plaçant ledit coffre (20) en communication directe avec ledit premier espace technique (11).

9. Étal réfrigéré selon la revendication 8, comprenant au moins un élément déflecteur (25, 26) qui est placé en correspondance avec ladite au moins une ouverture (24) et divise ledit espace creux (23) en un premier (23') et un second secteur (23"), chaque secteur communiquant avec ledit compartiment de chargement (20a) à travers l'une desdites fentes (71, 72),

ledit au moins un déflecteur (25, 26) s'étendant à l'intérieur dudit premier espace technique (11) pour délimiter :

- un premier conduit (27), dans lequel ledit évaporateur (50) est au moins partiellement logé et qui place le compartiment de chargement (10a) en communication directe avec ledit premier espace technique ; et
- au moins un second conduit (28a, 28b), qui place ledit premier conduit (27) en communication avec le premier secteur (23') dudit espace creux (23).

10. Étal réfrigéré selon la revendication 9, comprenant deux éléments déflecteurs (25, 26) qui délimitent deux seconds conduits (28a, 28b), séparés par ledit premier conduit (27), chacun desdits seconds conduits plaçant ledit premier conduit (27) en communication avec l'un des deux secteurs (23', 23") dudit espace creux (23).

11. Étal réfrigéré selon la revendication 9, dans lequel le second secteur (23") dudit espace creux (23) communique directement avec ladite ouverture (24).

12. Étal réfrigéré selon l'une quelconque des revendications 8 à 11, dans lequel lesdits moyens de ventilation comprennent au moins un ventilateur (60) positionné à proximité de ladite première ouverture, de préférence en correspondance avec ledit premier conduit (27).

13. Étal réfrigéré selon une ou plusieurs des revendications précédentes, dans lequel ledit coffre (20) est associé d'un seul tenant avec ledit élément colonnaire de support (10).

14. Étal réfrigéré selon la revendication 13, comprenant des pieds mobiles (14) associés avec ledit élément de support (10) pour régler la hauteur et/ou l'inclinaison dudit coffre (20) par rapport au sol.

15. Étal réfrigéré selon la revendication 14, dans lequel lesdits pieds mobiles (14) sont associés d'une manière coulissante avec des guides (15) réalisés sur ledit élément de support (10), lesdits pieds (14) étant de préférence réglables indépendamment l'un de l'autre.

16. Étal réfrigéré selon une ou plusieurs des revendications 13, 14 ou 15, dans lequel la partie inférieure (21) dudit coffre est inclinée selon un angle d'inclinaison (α) prédéfini, par rapport à un plan de référence horizontal (m), orthogonal par rapport à un axe d'extension principal (x) dudit élément colonnaire de support (10).

17. Étal réfrigéré selon la revendication précédente, dans lequel ledit compresseur (40) est installé de manière inclinée par rapport audit plan de référence (m) selon un angle de pré-inclinaison (β) prédéterminé, opposé par rapport à l'angle d'inclinaison (α) dudit coffre (20), lesdits deux angles (α, β) ayant de préférence la même amplitude.

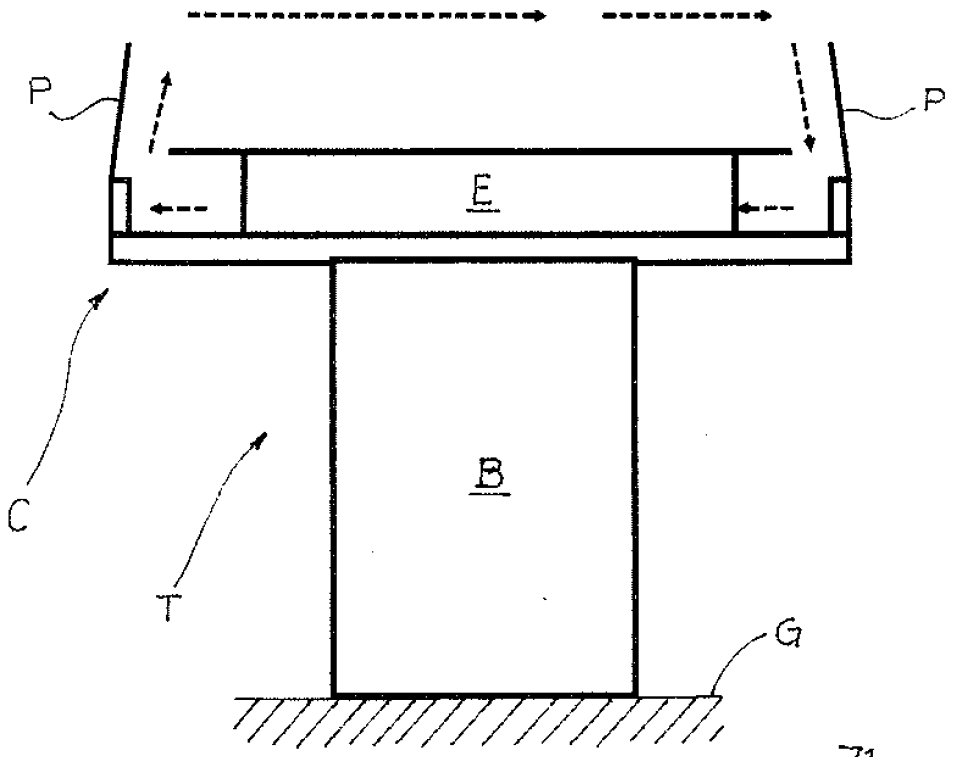

Fig. 1 (prior art)

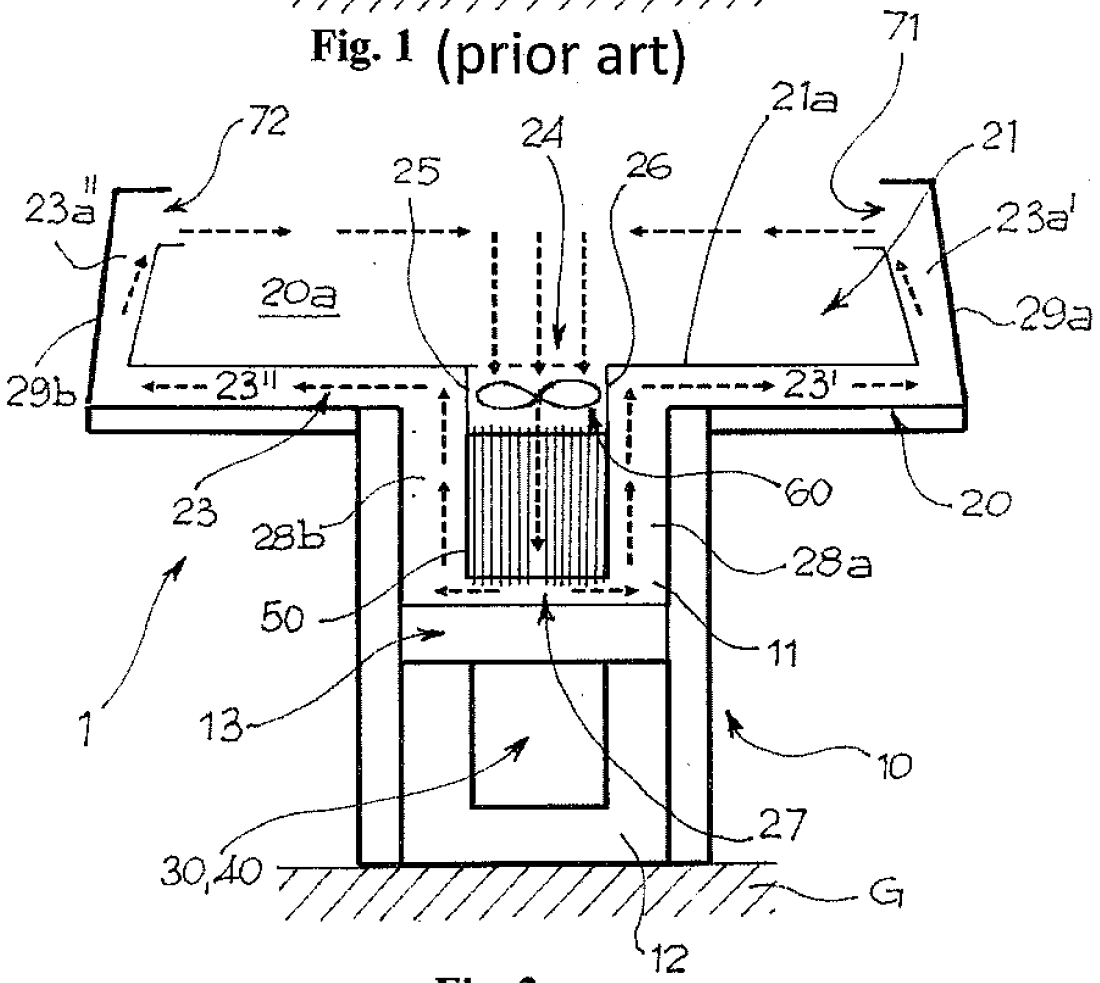

Fig. 2a

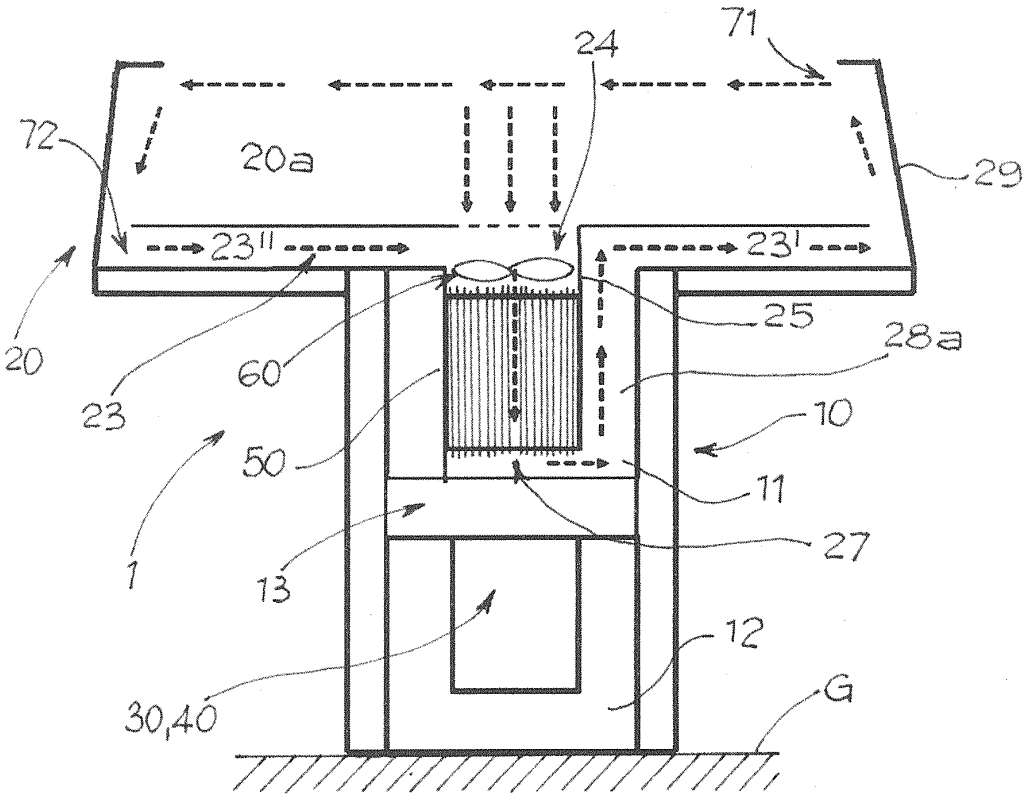
71
24
72
20a
29
23II
23I
20
25
28a
60
23
10
50
11
1
27
13
12
30,40
G

Fig. 2b

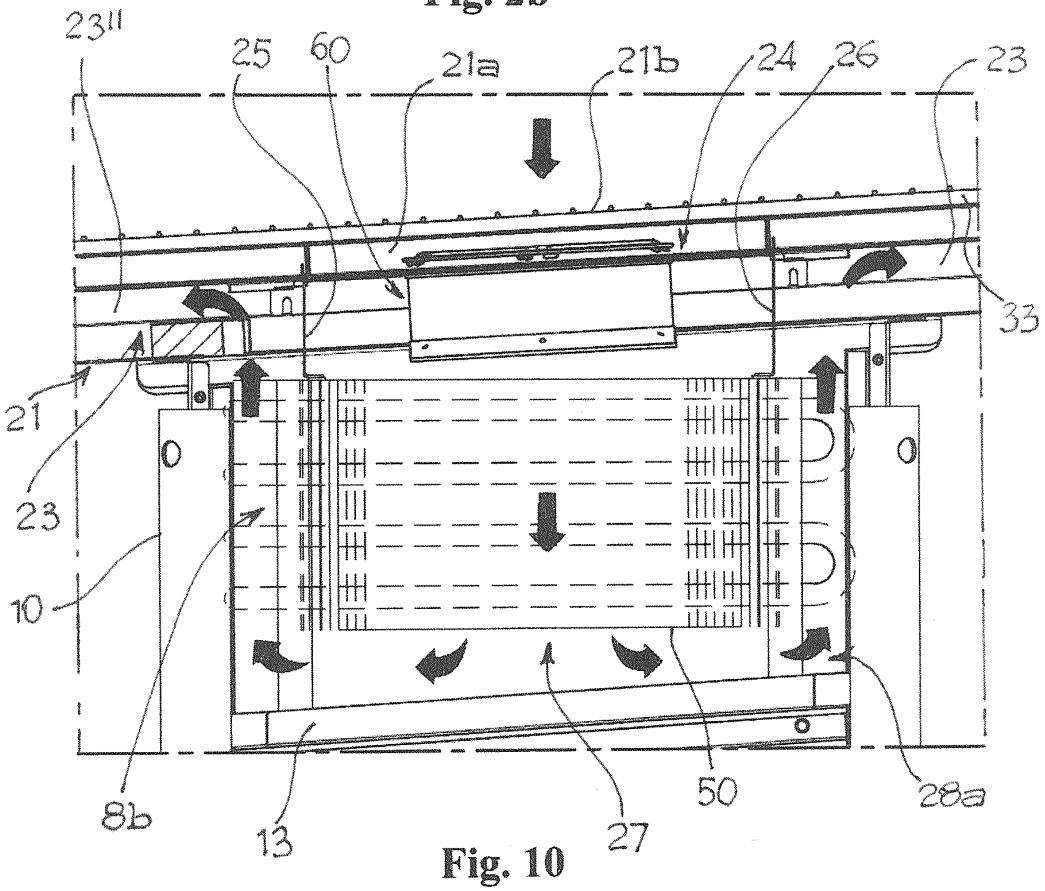
23II
25
60
21a
21b
24
26
23
33
21
23
10
8b
13
27
50
28a

Fig. 10

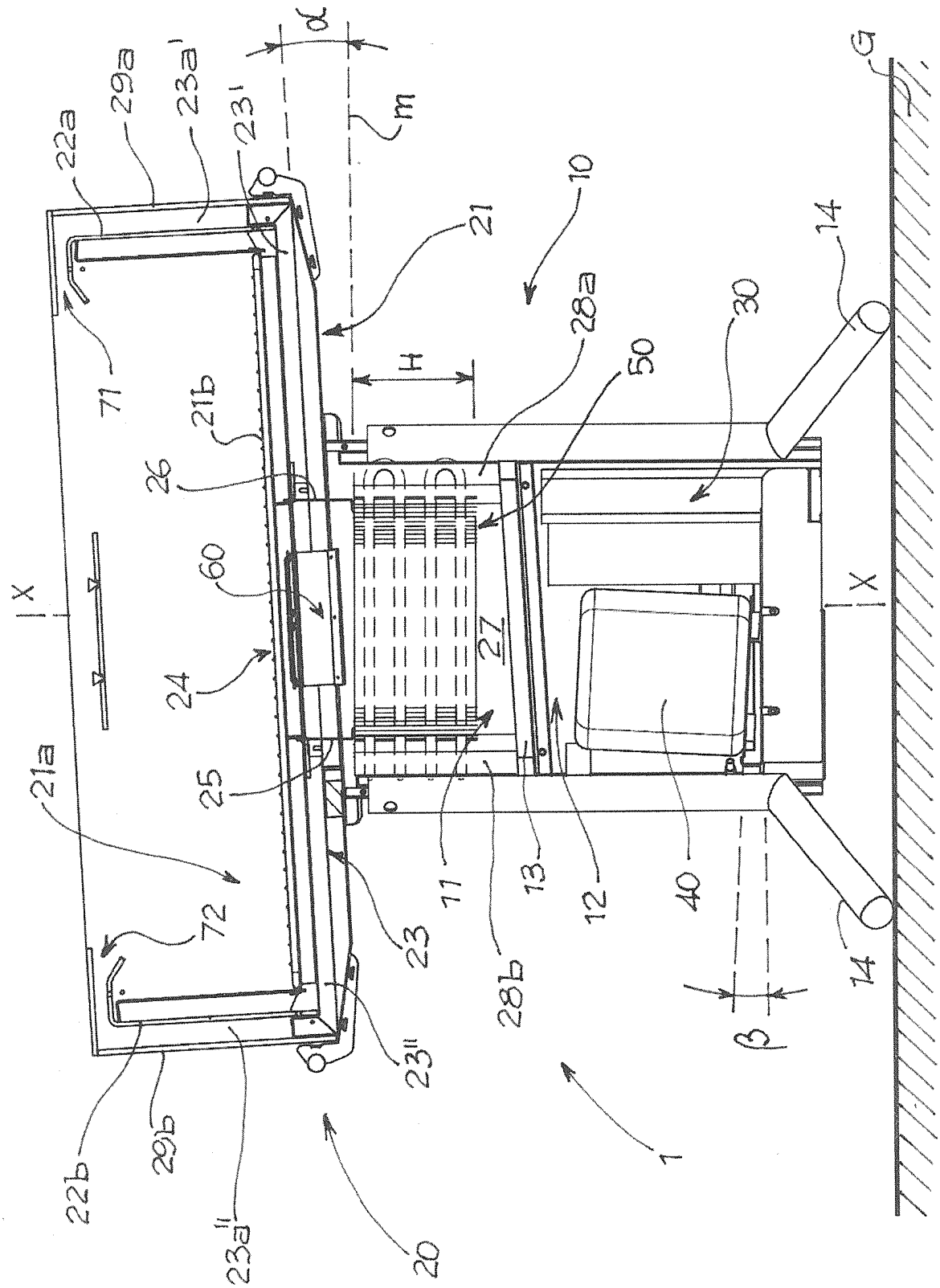
α
m
G
22a
29a
23a'
23'
10
21
14
71
21b
H
28a
50
30
26
60
X
X
24
27
21a
25
72
23
11
13
12
40
28b
14
B
23''
22b
29b
23a''
20
1

Fig. 3

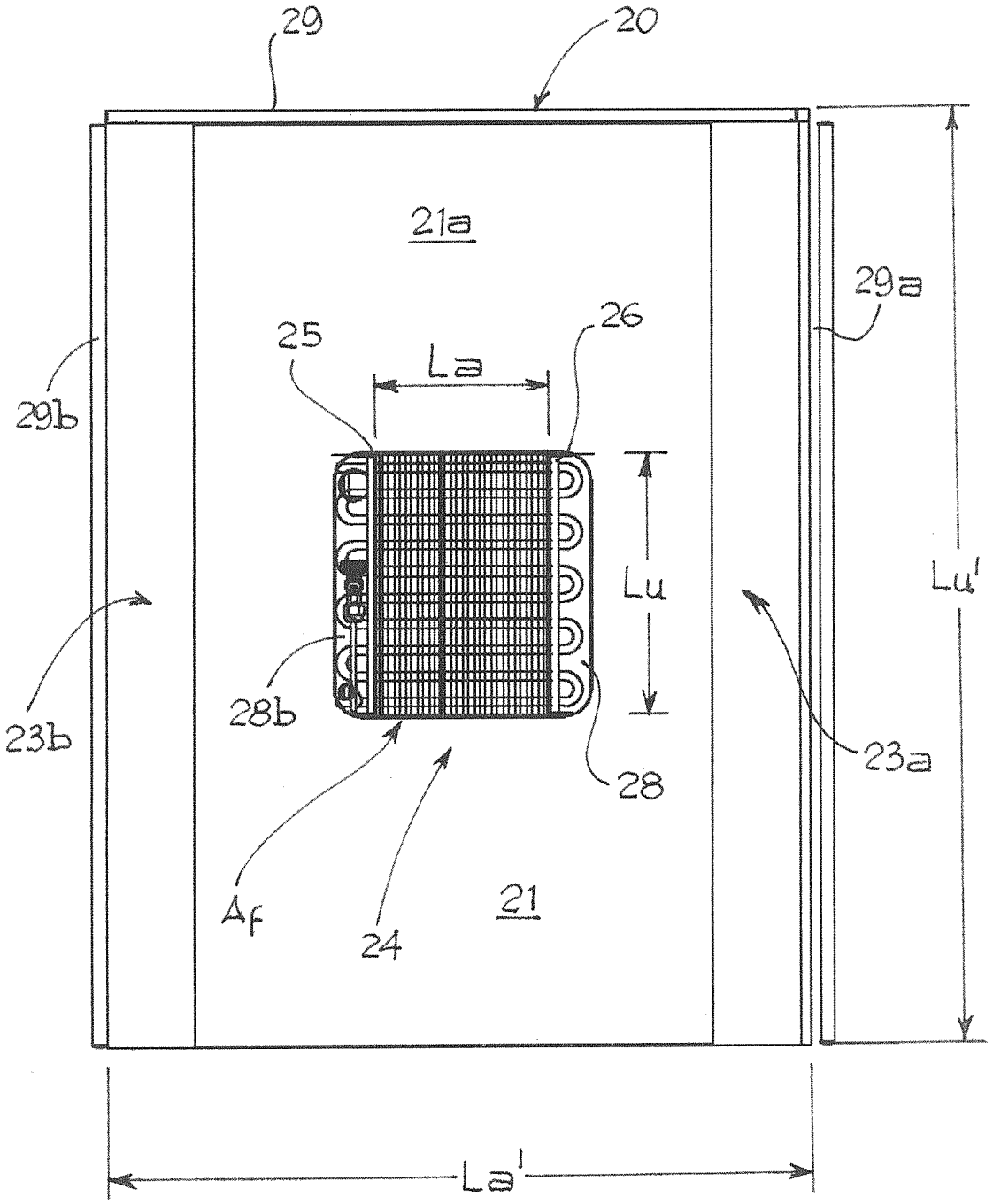

Fig. 4

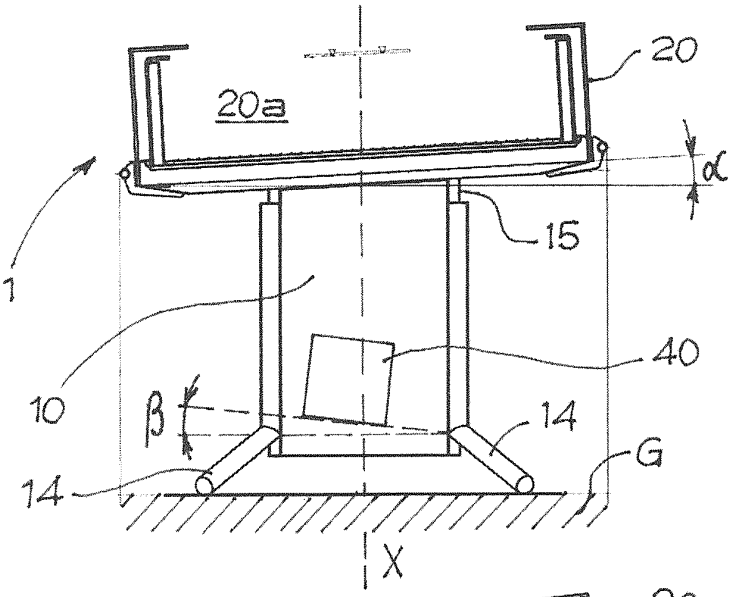

Fig. 5

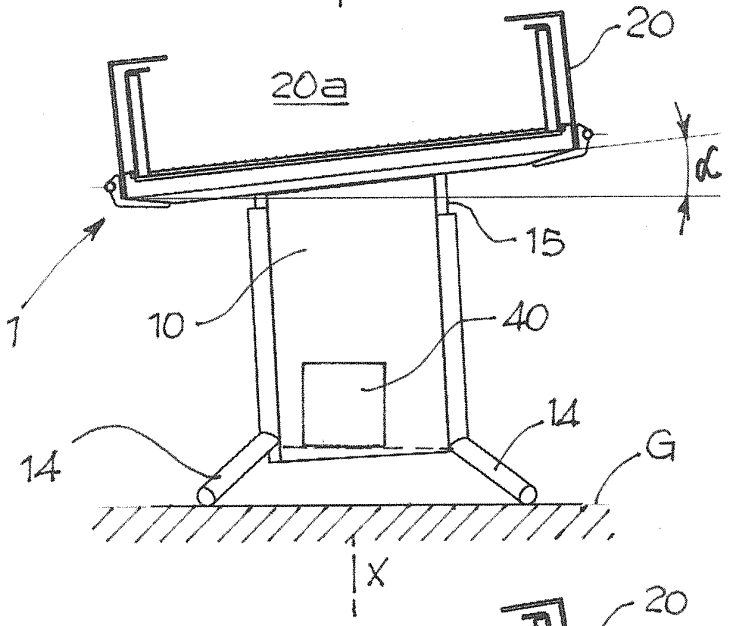

Fig. 6

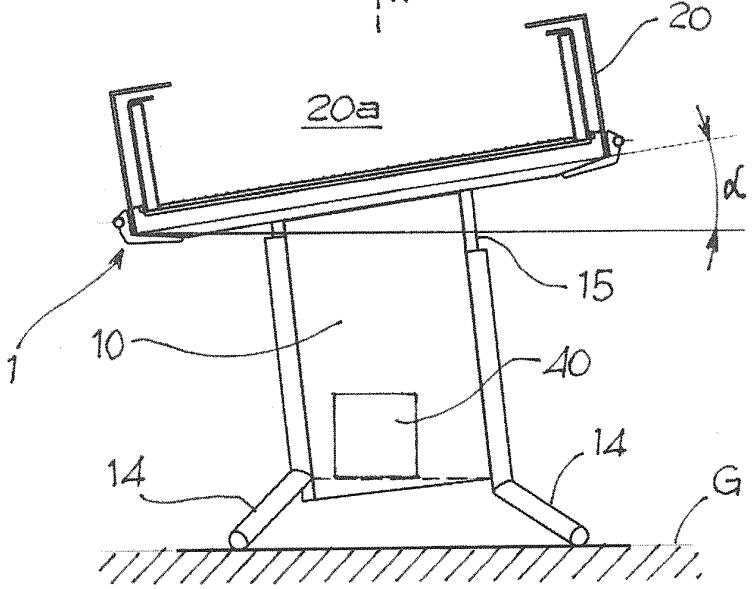

Fig. 7

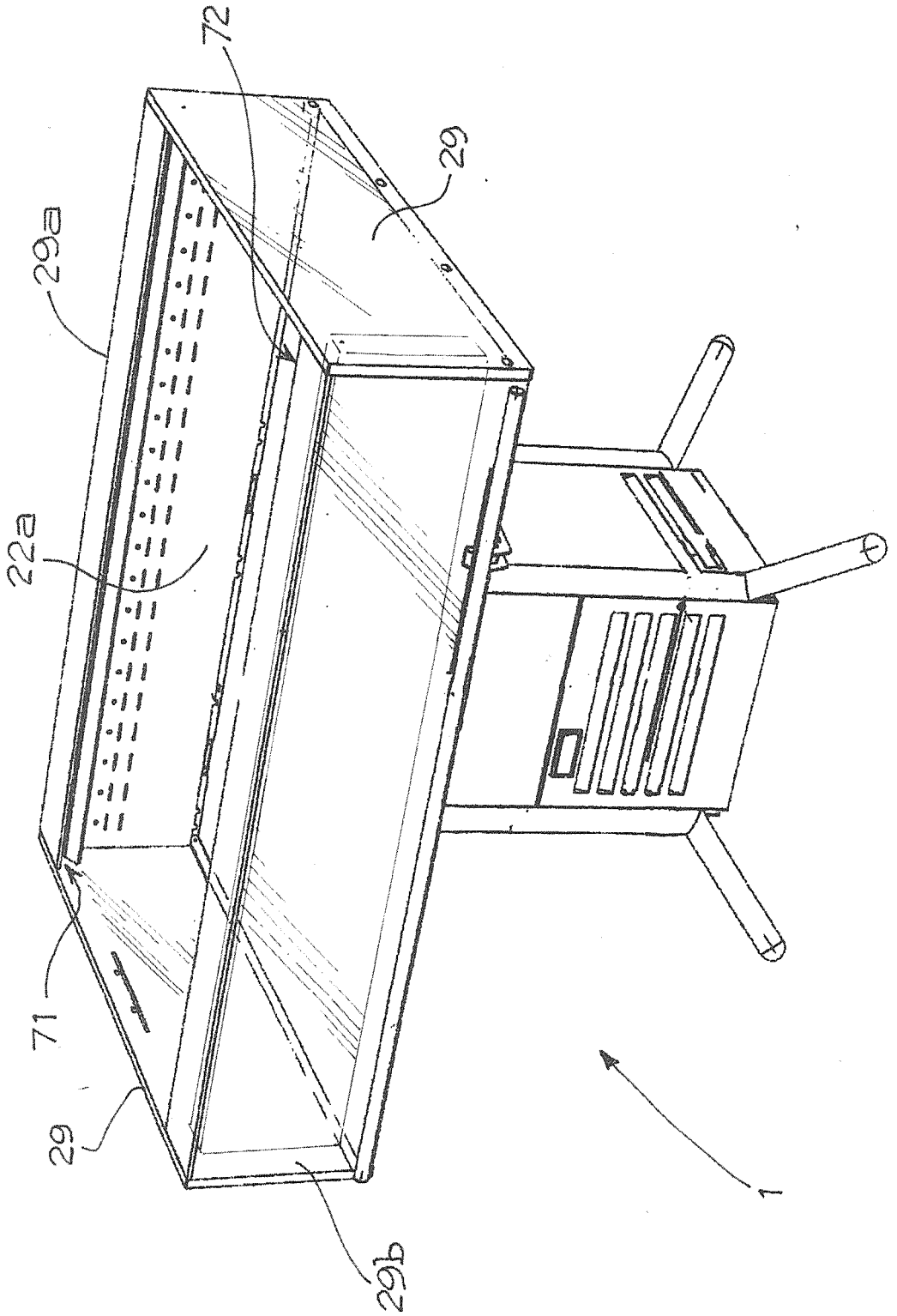

Fig. 8

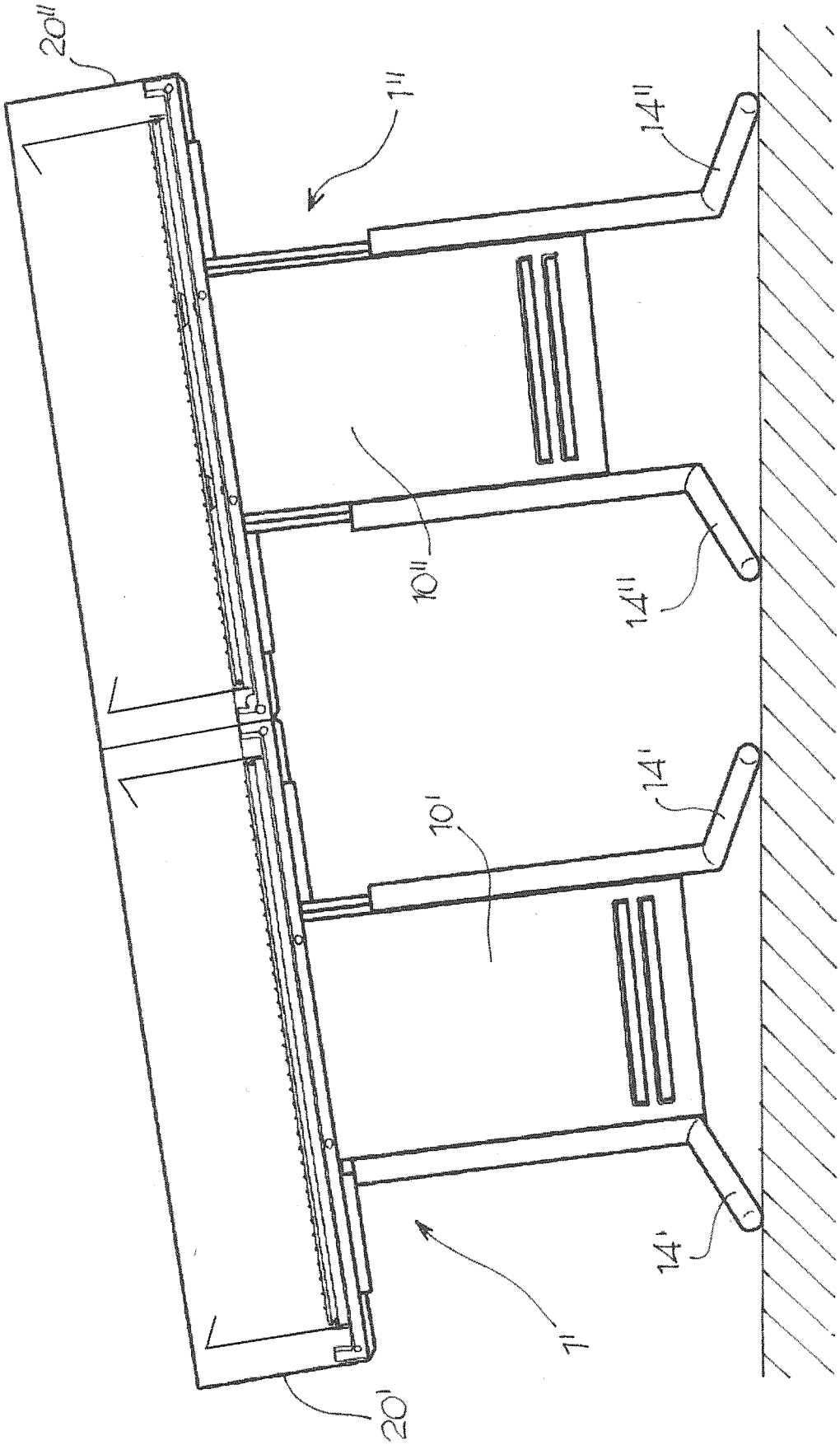

Fig. 9

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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