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(54) REFRIGERATED DISPLAY CABINET FOR REFRIGERATED PRODUCTS

(57) Refrigerated display cabinet for refrigerated products, comprising a support structure (2), comprising a refrigerated chamber (21) and a support frame (3), substantially contained within the refrigerated chamber (21) and comprising at least one dividing wall (30), which divides said refrigerated chamber (21) into a first half-chamber (S1) and into a second half-chamber (S2).

The display cabinet also comprises an air recirculation circuit (4), passing between the first half-chamber (S1) and the second half-chamber (S2), ventilation means (5), operatively connected to the air recirculation circuit (4), and a thermal cooling unit (6), placed to intercept the air recirculation circuit (4) in order to cool the air.

The air recirculation circuit (4) comprises a first air conveyance channel (40), placed below the refrigerated chamber (21) and placed as an air connection between the first half-chamber (S1) and the second half-chamber (S2) and a second conveyance channel (41), placed above said refrigerated chamber (21) and placed as an air connection between the first half-chamber (S1) and the second half-chamber (S2). The thermal cooling unit (6) comprises only one evaporator placed to intercept one between the first conveyance channel (40) and the second conveyance channel (41).

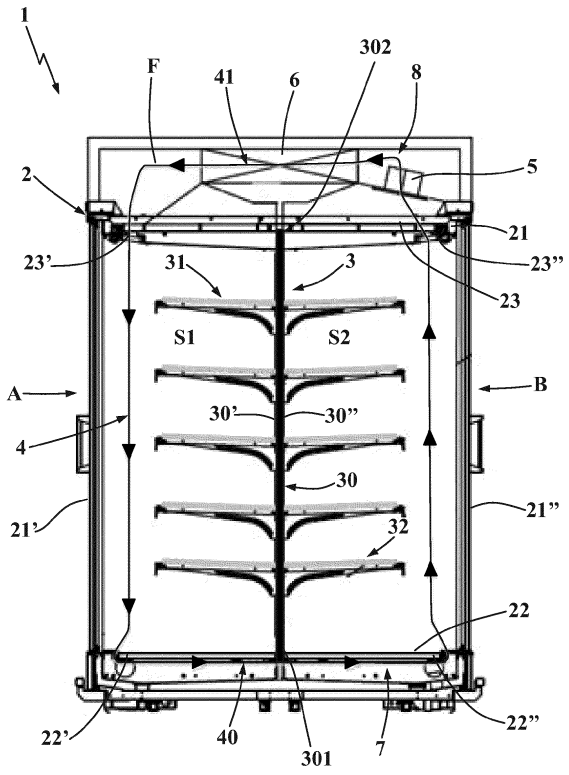

Fig. 2

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Description

Field of application

[0001] The present invention regards a refrigerated display cabinet for refrigerated products according to the preamble of the independent claim 1.

[0002] The present display cabinet for refrigerated products is advantageously intended to be employed in stores, supermarkets or other commercial locations for the display and sales of foodstuffs, perishable and otherwise. The display cabinet, object of the present invention, is intended to be used for the display of products which require a controlled temperature, which is maintained within the reference regulations.

[0003] The present display cabinet for refrigerated products is therefore inserted in the industrial field of production of refrigerated display cabinets of foodstuffs, in particular in the field of production of refrigerated display cabinets and counters for small, medium and large - scale retail channels.

State of the art

[0004] The display cabinets for refrigerated products are used for the display of foodstuffs at a controlled temperature, so as to maintain unchanged over time the characteristics of the displayed food product. Known on the market are various display cabinets which are distinguished by the shape and by the mode of display of the products to be preserved. In particular, the refrigerated display cabinets of known type can be of vertical type, e. g. column or wall type, or horizontal, of counter, tank or well type.

[0005] The refrigerated display cabinets of known type usually comprise a metallic support structure and an insulating structure, made of thermal insulation material, fixed to the support structure and adapted to define therewith a containment volume for the foods to be preserved.

[0006] More in detail, with particular reference to the vertical refrigerated display cabinets, the support structure is of cabin type and internally delimits a refrigerated chamber, accessible to users in order to allow the latter to pick up the product displayed within the refrigerated display cabinet.

[0007] The support structure of the refrigerated display cabinets of known type comprises a base wall, susceptible of being placed substantially in abutment against the ground, an opposite top wall, known in the technical jargon of the field with the term "top", two lateral shoulders, termed "flanks", and a rear wall, termed "back", opposite with respect to the access opening to the refrigerated chamber.

[0008] The back of the refrigerated display cabinets of known type is usually blind and is susceptible of being placed in abutment against a perimeter wall of the commercial enterprise in which the present refrigerated display cabinet is placed (from here the term "wall" which indicates the type of refrigerated display).

[0009] The display cabinets of known type also comprise a thermal cooling unit, which comprises an evaporator, which can be placed above or below the refrigerated chamber and is hydraulically connected to a refrigeration station placed outside the store, and ventilation means, in order to force the convection of the air and allow the recirculation within the refrigerated chamber.

[0010] More in detail, the aforesaid air recirculation is attained by forcing the air, through the aforesaid ventilation means, to traverse the refrigerated chamber in order to induce a closed circuit movement of the air within the same refrigerated chamber, in order to allow cooling the interior of the chamber.

[0011] For such purpose the recirculation circuit provides for a first passage opening, through which the refrigerated air enters within the refrigerated chamber. Such first passage opening is usually placed below the refrigerated chamber (being placed usually below the ventilation means).

[0012] Also known are display cabinets in which the first passage opening is placed above the refrigerated chamber. In this case, a conveyance channel is provided, usually made in an equipment space placed behind the back of the display cabinet, arranged for conveying the refrigerated air from the ventilation means to the upper access opening.

[0013] The display cabinets of known type described up to now have in practice shown that they do not lack drawbacks. A first drawback lies in the fact that they do not allow preserving foodstuffs that require different preservation temperatures within the same display cabinet.

[0014] A further drawback lies in the fact that such wall display cabinets, in the event in which they are employed for forming aisles not supported by a wall, are usually placed in pairs with the respective backs facing.

[0015] This causes the loss of a high quantity of commercial space, and consequently display space.

[0016] In order to at least partly overcome the aforesaid problems, refrigerated display cabinets have been developed, for example described in patents DE 20300225, US 3392543 and US 4373355, which comprise a support structure which internally delimits a refrigerated containment chamber accessible from two opposite sides. In particular, the documents US 3392543 and US 4373355 describe refrigerated display cabinets whose support structure comprises two separate equipment spaces, including a first equipment space placed below the refrigerated containment chamber, and a second equipment space placed below the refrigerated containment chamber.

[0017] The support structure is also provided with a central dividing wall, which divides the refrigerated chamber into a first half-chamber, accessible from a first door, and a second half-chamber, accessible from a second door. In particular, the central dividing wall of the display cabinets of known type comprises two panels that are spaced from each other, which define a central recircu-

lation duct, air-connected to the two equipment spaces placed above and below the refrigerated chamber, in order to allow the ascending of the recirculation air flow from the lower equipment space to the upper equipment space by means of the same central dividing wall.

[0018] Both of the aforesaid display cabinets of known type comprise two separate air recirculation circuits, each of which completes an annular path that traverses the corresponding half-chamber, enters into the lower equipment space and then reaches the upper equipment space passing through the slit of the central dividing wall.

[0019] The display cabinets of known type comprise ventilation means and a thermal cooling unit, which are placed to intercept the air recirculation circuits in order to cool the passing air flow and allow maintaining the refrigerated chamber at a controlled temperature.

[0020] In particular, the thermal unit of the display cabinet described in the patent US 3392543 comprises two evaporators which are placed within the upper equipment space, each intercepting a different air recirculation circuit, in a manner such that the two half-chambers are air-insulated from each other and cooled by independent evaporators by means of separate air recirculation circuits.

[0021] However, also such solution has in practice demonstrated that it does not lack drawbacks.

[0022] The main drawback lies in the fact that such solution has proven complicated to attain, since it requires a high air insulation between the two half-chambers.

[0023] In addition, such solution has proven expensive, also regarding the assembly, comprising two separate evaporators and two separate ventilation means.

[0024] A further drawback lies in the fact that such solution also requires a great expenditure of energy, since it requires supplying two separate evaporators and two separate ventilation means for operating the display cabinet.

[0025] In addition, such solution requires the use of ventilation means provided with greater power in order to allow the circulation of the air flows of the two recirculation circuits also within the dividing wall.

[0026] Alternatively, the aforesaid patent US 4373355 uses only one evaporator, which is placed within the slit of the central dividing wall, which is provided with an enlarged base portion adapted to contain the evaporator and the ventilation means.

[0027] The main drawback of such solution lies in the fact that it is only applicable on large-size display cabinets, in which it is possible to obtain a slit in the central dividing wall adapted to allow the evaporator and the ventilation means.

[0028] A further drawback lies in the fact that, in the event in which one wishes to limit the dimensions of the same display cabinet, it is necessary to employ evaporators with reduced dimensions, with the risk of not obtaining an effective cooling of the air flow. A further drawback lies in the fact that such display cabinet of known type does not have a very nice appearance, since it requires using "blind" non-transparent dividing walls in order to prevent showing the evaporator and the ventilation means. This can also determine that a user, when situated across from a first half-chamber, is unable to see the articles displayed in the other half-chamber.

Presentation of the invention

[0029] In this situation, the problem underlying the present invention is therefore that of overcoming the drawbacks manifested by the abovementioned solutions of known type, by providing a refrigerated display cabinet which is simple and easy to attain. A further object of the present finding is to provide a refrigerated display cabinet which allows preserving foodstuffs at different maintenance temperatures.

[0030] A further object of the present finding is to provide a refrigerated display cabinet which requires a reduced energy consumption.

[0031] A further object of the present finding is to provide a refrigerated display cabinet which is entirely reliable in operation.

Brief description of the drawings

[0032] The technical characteristics of the invention, according to the aforesaid objects, can be clearly seen from the contents of the below-reported claims and the advantages thereof will be more evident in the following detailed description, made with reference to the enclosed drawings, which represent several merely exemplifying and non-limiting embodiments of the invention, in which:

- Figure 1 shows a front perspective view of a display cabinet, object of the present invention, in accordance with a first embodiment;
- Figure 2 shows a sectional side view of the display cabinet of figure 1;
- Figure 3 shows a sectional side view of a display cabinet, object of the present invention, in accordance with a second embodiment in which a dividing wall is provided with passage slits;
- Figure 4 shows an embodiment variant of the display cabinet of figure 3, in which the passage slits are provided with a greater extension.

Detailed description of a preferred embodiment

[0033] With reference to the enclosed drawings, reference number 1 refers to the refrigerated display cabinet, object of the present invention.

[0034] The refrigerated display cabinet 1 according to the present invention is intended to be employed for preserving various foodstuffs at a controlled temperature, and simultaneously allow their display, for example for sales purposes.

[0035] In particular, the present refrigerated display

cabinet 1 can be of the type employable for preservation of foodstuffs at temperatures greater than that of freezing of the foodstuffs, and at temperatures lower than the freezing temperature.

[0036] Hereinbelow, reference will be made to a refrigerated display cabinet of vertical type; however it is intended that, without departing from the scope of the present invention, the present refrigerated display cabinet can also be of another type, such as of column, wall, semi-vertical type, or of horizontal counter, tank or well type.

[0037] In accordance with the idea underlying the present invention, the display cabinet 1 of refrigerated products comprises a support structure 2, preferably made of metallic material.

[0038] Advantageously, the support structure 2 has substantially box-like shape and is extended between a base wall, susceptible of being placed in abutment against the ground, and an opposite top wall.

[0039] The support structure 2 comprises a refrigerated containment chamber 21, which is preferably provided with a substantially box-like extension, is extended between a first side 21' and a second side 21", at each of which the refrigerated containment chamber 21 is provided respectively with a first access opening A and with a second access opening B. More in detail, at the first side 21', the refrigerated containment chamber 21 is provided with the first access opening A and, at the second side 21", the refrigerated containment chamber 21 is provided with the second access opening B. Advantageously, the aforesaid access openings are closeable, for example by doors, which can be of hinged type, i.e. hinged to the support structure, or of slidable type, in order to insulate the refrigerated containment chamber 21 from the outside environment and to maintain a substantially constant temperature within the refrigerated containment chamber 21.

[0040] Of course, it is possible to not close the access openings A, B, in this case providing that the refrigerated containment chamber 21 be in direct contact with the outside environment of the commercial location where the display cabinet 1 is installed. Alternatively, it is possible to provide for the closure of only one of the two access openings A, B, leaving the opposite opening A, B instead open.

[0041] The support structure 2 also comprises a support frame 3, which is substantially contained within the refrigerated containment chamber 21 and comprises at least one dividing wall 30, which divides the refrigerated containment chamber 21 into a first half-chamber S1 and into a second half-chamber S2, which are accessible by means of, respectively, the first access opening A and the second access opening B.

[0042] More in detail, the dividing wall is advantageously extended between a first face 30', directed towards the first access opening A of the refrigerated containment chamber 21, and a second face 30", opposite the first face 30' and directed towards the second access opening B of the refrigerated containment chamber 21.

[0043] Advantageously, the first half-chamber S1 is extended between the first face 30' of the dividing wall 30 and the first access opening A of the refrigerated containment chamber 21, and the second half-chamber S2 is extended between the second face 30" of the dividing wall 30 and the second access opening B of the refrigerated containment chamber 21.

[0044] In accordance with the preferred embodiment, the dividing wall 30 comprises a single panel, preferably made of transparent material, e.g. plexiglass, polycarbonate or glass. Advantageously, in accordance with the aforesaid embodiment, the panel of the dividing wall 30 has dimensions substantially coinciding with those of the refrigerated chamber 21.

[0045] In particular, the dividing wall 30 comprises a single solid panel.

[0046] Otherwise, in accordance with an embodiment not illustrated in the enclosed figures, the dividing wall 30 is made of multiple panels, preferably coplanar, side-by-side to compose a single dividing wall 30.

[0047] In accordance with a further embodiment, not illustrated, the dividing wall 30 comprises two panels, preferably made of transparent material, which are both provided with dimensions substantially coinciding with those of the refrigerated chamber 21 and are substantially placed parallel and spaced, so as to define a slit interposed between the aforesaid two panels of the dividing wall 30.

[0048] In accordance with the preferred embodiment, the refrigerated containment chamber 21 comprises at least one upper wall 23 and a bottom wall 22, substantially parallel and respectively defining, on the top and bottom, the refrigerated containment chamber 21. Preferably, the dividing wall 30 is extended between the bottom wall 22 and the upper wall 23 of the refrigerated containment chamber 21, so as to be totally contained within the latter. Advantageously, the support frame 3 comprises an external frame 33, preferably made of metallic material, fixed to the refrigerated containment chamber 21 and carrying the dividing wall 30 mounted thereon.

[0049] More in detail, the external frame 33 has substantially polygonal form, comprises four sides, parallel to the internal walls of the refrigerated containment chamber 21 and fixed to the aforesaid internal walls of the refrigerated containment chamber 21.

[0050] Preferably, the external frame 33 is interposed between the dividing wall 30 and the refrigerated containment chamber 21 in order to allow a stable fixing of the dividing wall 30.

[0051] Otherwise, in accordance with an embodiment not illustrated in the enclosed figures, the dividing wall 30 is directly fixed to the refrigerated containment chamber 21. Preferably, the external frame 33 is attained by means of a metallic tubular section. Advantageously, the external frame 33 is extended, along an axial extension direction, placed orthogonal to the dividing wall 30, be-

tween a first flank, directed towards the first access opening A, and a second flank, opposite the first flank and directed towards the second access opening B.

[0052] In accordance with the preferred embodiment, the dividing wall 30 is placed in a median position along the aforesaid extension of the external frame 33.

[0053] Otherwise, in accordance with the embodiment variant in which the dividing wall 30 comprises two parallel and spaced panels, a first panel is mounted at the first flank of the external frame 33, and the second panel is mounted at the second flank of the external frame 33.

[0054] In this manner, the slit interposed between the two panels of the dividing wall 30 has extension, measured along the axial extension direction of the external frame 33, substantially coinciding with the extension of the external frame 33 along the same axial extension direction.

[0055] Advantageously, the display cabinet 1 comprises a plurality of first shelves 31, which are fixed to the support structure 2 and are placed in the first half-chamber S1, one on top of the other and spaced from each other. Advantageously, the display cabinet 1 also comprises a plurality of second shelves 32, fixed to the support structure 2 and placed in the second half-chamber S2.

[0056] In accordance with the preferred embodiment, the first and the second shelves 31,32 are mounted on the dividing wall 30, and in particular the first shelves 31 are mounted on the first face 30' of the dividing wall 30, and the second shelves 32 are mounted on the second face 30" of the dividing wall 30.

[0057] Advantageously, the first and the second shelves 31, 32 are made of a transparent material, such as for example plexiglass, polycarbonate or glass.

[0058] Advantageously, the first and the second shelves 31, 32 comprise multiple first and second anchorage brackets 310, 320, fixed to the dividing wall 30, in particular respectively on the first face 30' and on the second face 30" of the dividing wall 30.

[0059] Advantageously, the first and the second shelves 31, 32 comprise multiple display shelves 311,321, respectively fixed to the first and second anchorage brackets 310, 320 and arranged for supporting the products to be displayed within the refrigerated chamber 21.

[0060] Otherwise, in accordance with an embodiment variant, the first and the second shelves 31, 32 are fixed to the support structure 2.

[0061] For example, the first and the second shelves 31, 32 are fixed to the upper wall 23 and to the bottom wall 22 of the refrigerated containment chamber 21 by means of tensioned cables, preferably made of metallic material.

[0062] The display cabinet 1 of refrigerated products also comprises an air recirculation circuit 4, which passes into the first half-chamber S1 and into the second half-chamber S2 of the refrigerated chamber 21, and ventilation means 5, operatively connected to the air recirculation circuit 4 and arranged for circulating an air flow F within the air recirculation circuit 4.

[0063] The display cabinet 1 of refrigerated products also comprises a thermal cooling unit 6, placed to intercept the air flow F in order to cool the air.

[0064] The air recirculation circuit 4 comprises a first air conveyance channel 40, placed below the refrigerated containment chamber 21 and placed as an air connection between the first half-chamber S1 and the second half-chamber S2, and provided with at least one first passage opening 22', which places the first half-chamber S1 in air communication with the first conveyance channel 40, and with a second passage opening 22", which places the first conveyance channel 40 in air communication with the second half-chamber S2.

[0065] The air recirculation circuit 4 also comprises at least one second conveyance channel 41 placed above the refrigerated chamber 21, placed as an air connection between the first half-chamber S1 and the second half-chamber S2, and provided with at least one third passage opening 23', which places the second half-chamber S2 in air communication with the second conveyance channel 41, and with a fourth passage opening 23", which places the second conveyance channel 41 in air communication with the first half-chamber S1.

[0066] Advantageously, the dividing wall 30 is extended between a lower end 301 placed at the first conveyance channel 40 and an upper end 302 placed at the second conveyance channel 41. Preferably, at least one between the lower end 301 and the upper end 302 of the dividing wall 30 is closed, and in particular both such ends 301, 302 are closed. More in detail, the dividing wall 30 is preferably placed with its lower end 30' in abutment against the bottom wall 22 and with its upper end 30" in abutment against the upper wall 23. Preferably, the bottom wall 22 and the upper wall 23 are closed at, respectively, the lower end 301 and upper end 302 of the dividing wall 30, as better described hereinbelow.

[0067] In addition, the thermal cooling unit 6 comprises only one evaporator, placed to intercept one between said first conveyance channel 40 and said second conveyance channel 41.

[0068] Advantageously, the evaporator of the thermal cooling unit 6 comprises at least one thermal exchange battery, e.g. of plate or tube bundle type, or of coil type.

[0069] Of course, without departing from the protective scope of the present invention, the evaporator of the thermal cooling unit 6 can also comprise multiple thermal exchange batteries that are hydraulically connected to each other, for example in series or in parallel, so as to increase the thermal power of the evaporator itself.

[0070] In this manner, one obtains a display cabinet 1 for refrigerated products, which is provided with a first and a second refrigerated half-chamber S1, S2, which are accessible from opposite sides and are arranged for preserving foodstuffs, even at different maintenance temperatures.

[0071] In addition, the display cabinet 1 for refrigerated

products this obtained allows optimizing the energy consumptions and the production costs, being provided with a single evaporator and a single air recirculation circuit 4.

[0072] In particular, the air recirculation circuit 4 described up to now is a recirculation circuit common to the first half-chamber S1 and to the second half-chamber S2, traversing in succession both the half-chambers S1, S2, and in particular it first traverses the first half-chamber S1 and then the second half-chamber S2.

[0073] Advantageously therefore the entire air flow F that traverses the first half-chamber S1 also traverses the second half-chamber S2.

[0074] Advantageously, the ventilation means 5 are arranged for flowing the air flow F in the first air conveyance channel 40 from the first passage opening 22' to the second passage opening 22", and for flowing the air flow F in the second conveyance channel 41 from the fourth passage opening 23" to the third passage opening 23'. More in detail, the ventilation means 5 are arranged for making the air flow (coming from the first half-chamber S1) enter into the first conveyance channel 40 through the first passage opening 22', and for making the air flow exit from such first conveyance channel 40 through the second passage opening 22" in order to make the air flow enter into the second half-chamber S2.

[0075] In addition, the ventilation means 5 are arranged for making the air flow (coming from the second half-chamber S2) enter into the second conveyance channel 41 through the fourth passage opening 23", and for making the air flow exit from such second conveyance channel 41 through the third passage opening 23' in order to make the air flow enter into the first half-chamber S1.

[0076] Advantageously, the thermal cooling unit 6 also comprises, in a per se known manner, at least one condenser and at least one compressor, arranged for feeding the thermal cooling unit 6 by means of a refrigerated fluid in a known manner, hence not described in detail hereinbelow.

[0077] In accordance with the preferred embodiment, the evaporator is mounted on the support structure 2, preferably within the latter, while the condenser and the compressor are placed outside the display cabinet 1, preferably in a thermal station placed outside the commercial location where the display cabinet 1 is situated.

[0078] Advantageously, the support structure 2 comprises a first equipment space 7, placed below the refrigerated chamber 21, and extended between the bottom wall 22 of the refrigerated containment chamber 21 and the base wall of the support structure 2.

[0079] In addition, the support structure 2 comprises a second equipment space 8, placed above the refrigerated chamber 21, and extended between the upper wall 23 of the refrigerated containment chamber 21 and the top wall of the support structure 2.

[0080] Preferably, the first and the second equipment space 7, 8 have substantially box-like shape and at least partially define the first and the second conveyance channel 40, 41. Advantageously, the first conveyance channel 40 is placed within the first equipment space 7, and preferably coincides with the latter.

[0081] Of course, without departing from the protective scope of the present patent, the first conveyance channel 40 can also be defined by a duct, not shown, extended within the first equipment space 7 and be air-insulated from the latter.

[0082] Advantageously, as set forth above, the refrigerated containment chamber 21 comprises at least one bottom wall 22, which on the bottom delimits the refrigerated chamber 21 and on which at least the first passage opening 22' and the second passage opening 22" are obtained.

[0083] Preferably, the first passage opening 22' and the second passage opening 22" are only obtained on the bottom wall 22, so as to ensure the downflow of the air flow F in an unequivocal manner from the first half-chamber S1 to the second half-chamber S2, preventing the air flow F from being able to return into the first half-chamber S1 from the first conveyance channel 40 and/or return into the latter from the second half-chamber S2.

[0084] Preferably, the bottom wall 22 separates the first equipment space 7 from the refrigerated containment chamber 21.

[0085] Advantageously, the first and the second passage openings 22', 22" are made on opposite sides with respect to the bottom wall 22 of the refrigerated containment chamber 21.

[0086] More in detail, the first and the second passage openings 22', 22" are preferably made in proximity respectively to the first and the second access opening A, B, so as to allow the air flow F to circulate substantially parallel in proximity to the aforesaid openings A, B, defining an air blade arranged for at least partly air-insulating the refrigerated containment chamber 21 from the outside environment.

[0087] Advantageously, the second conveyance channel 41 is placed within the second equipment space 8, and preferably coincides with the latter.

[0088] Of course, without departing from the protective scope of the present patent, the second conveyance channel 41 can also be defined by a duct, not shown, extended within the second equipment space 8 and be air-insulated from the latter.

[0089] Advantageously, as set forth above, the refrigerated containment chamber 21 comprises at least one upper wall 23, which on the top delimits the refrigerated chamber 21 and on which at least the third passage opening 23' and the fourth passage opening 23" are made.

[0090] Preferably, the third passage opening 23' and the fourth passage opening 24" are only made on the upper wall 23, so as to ensure the downflow of the air flow F in an unequivocal manner from the second half-chamber S2 to the first half-chamber S1, preventing the air flow F from being able to return in the second half-chamber S2 from the second conveyance channel 41 and/or return in the latter from the first half-chamber S1.

[0091] Preferably, the upper wall 23 separates the sec-

ond equipment space 8 from the refrigerated containment chamber 21.

[0092] Advantageously, the third and the fourth passage opening 23', 23" are made on opposite sides with respect to the upper wall 23 of the refrigerated containment chamber 21.

[0093] More in detail, the third and the fourth passage opening 23', 23" are preferably made in proximity respectively to the first and the second access opening A, B, so as to allow the air flow F to circulate substantially in proximity to the aforesaid openings A, B, defining an air blade arranged for at least partly air-insulating the refrigerated containment chamber 21 from the outside environment.

[0094] Advantageously, the first passage opening 22' is substantially aligned with the third passage opening 23', and the second passage opening 22" is substantially aligned with the fourth passage opening 23".

[0095] Advantageously, the evaporator of the thermal cooling unit 6 is placed to intercept the second conveyance channel 41.

[0096] Advantageously, the evaporator of the thermal cooling unit 6 is placed within one between the first conveyance channel 40 and the second conveyance channel 41.

[0097] In accordance with the preferred embodiment, the thermal cooling unit is placed within the second equipment space 8. Preferably, the evaporator of the thermal cooling unit 6 is placed within the second conveyance channel 41.

[0098] Advantageously, the ventilation means 5 are placed within the first conveyance channel 40 or within one between the first conveyance channel 40 and the second conveyance channel 41, so as to intercept the air flow F in order to force the circulation thereof along the recirculation circuit 4.

[0099] In accordance with the preferred embodiment, the ventilation means 5 are placed within the second equipment space 8, preferably within the second conveyance channel 41.

[0100] In accordance with the aforesaid preferred embodiment the ventilation means 5 are configured for suctioning the air flow F from the second half-chamber S2 into the second conveyance channel 41 through the fourth passage opening 23", and for insufflating the air flow F from the second conveyance channel 41 into the first half-chamber S1 through the third passage opening 23'.

[0101] In particular, as illustrated in the enclosed figures, the air recirculation circuit 4 allows the air flow F to complete a substantially annular closed path that passes through both the half-chambers S1, S2.

[0102] Operatively, during the operation of the present refrigerated display cabinet 1, the air flow F, for example starting from the first half-chamber S1, traverses the first passage opening 22' and enters into the first conveyance channel 40, follows the conveyance channel 40 up to the second passage opening 22" through which the air flow arrives in the second half-chamber S2.

[0103] Subsequently, the air flow F ascends along the second half-chamber S2 from the second passage opening 22" up to the fourth passage opening 23" through which it enters into the second conveyance channel 41. The air flow F then follows the second conveyance channel 41 from the fourth passage opening 23" up to the third passage opening 23' and, traversing the latter, once again reaches the first half-chamber S1, in which the air flow F is induced to descend towards the first passage opening 22' in order to restart its travel along the recirculation circuit 4.

[0104] Advantageously, the dividing wall 30 is provided with at least one passage slit 300. Preferably, the dividing wall 30 comprises multiple passage slits 300, which are placed between the shelves 31, 32. More in detail, in accordance with the preferred embodiment, the passage slits 300 are placed in proximity to the shelves 31, 32 in order to induce the air flow F to hit the first and the second shelves 31, 32, cooling them.

[0105] In this manner, the passage slits 300 allow a portion of the air flow F to pass from the first half-chamber S1 towards the second half-chamber S2, before reaching the first conveyance channel 40.

[0106] In this manner, it is possible to preserve, within the two half-chambers S1, S2, products that require similar preservation temperatures, since the air flow F can pass between the two half-chambers S1, S2 before transferring a high quantity of heat Q to the products preserved in the first half-chamber S1.

[0107] Of course, the passage slits 300 can be made of different dimensions and in different positions, as a function of the portion of air flow F that one wishes to force to pass from the first half-chamber S1 towards the second half-chamber S2 before reaching the first conveyance channel 40.

[0108] The display cabinet 1 of refrigerated products therefore attains the pre-established obj ects.

Claims

1. Refrigerated display cabinet (1) for refrigerated products, **characterized in that** it comprises:

    - a support structure (2), comprising:

        - a refrigerated containment chamber (21) extended between a first side (21') and an opposite second side (21"); wherein, at said first side (21'), said refrigerated containment chamber (21) is provided with at least one first access opening (A) and, at said second side (21"), said refrigerated containment chamber (21) is provided with at least one second access opening (B);
        - a support frame (3), substantially contained within the refrigerated containment chamber (21), comprising at least one di-

viding wall (30), which divides said refrigerated containment chamber (21) into a first half-chamber (S1) and into a second half-chamber (S2), respectively accessible by means of said first access opening (A) and said second access opening (B);

- an air recirculation circuit (4), passing into said first half-chamber (S1) and said second half-chamber (S2);
- ventilation means (5), operatively connected to said air recirculation circuit (4) and arranged for circulating an air flow (F) within said recirculation circuit (4);
- a thermal cooling unit (6), placed to intercept said air recirculation circuit (4) in order to intercept said air flow (F) and cool the air thereof;

wherein said air recirculation circuit (4) comprises:

- a first air conveyance channel (40), placed below said refrigerated containment chamber (21) and placed as an air connection between said first half-chamber (S1) and said second half-chamber (S2), and provided with at least one first passage opening (22'), which places said first half-chamber (S1) in air communication with said first conveyance channel (40), and with a second passage opening (22"), which places said first conveyance channel (40) in air communication with said second half-chamber (S2);
- at least one second conveyance channel (41) placed above said refrigerated containment chamber (21), placed as an air connection between said first half-chamber (S1) and said second half-chamber (S2), and provided with at least one third passage opening (23'), which places said second half-chamber (S2) in air communication with said second conveyance channel (41), and with a fourth passage opening (23"), which places said second conveyance channel (41) in air communication with said first half-chamber (S1);

wherein said thermal cooling unit (6) comprises only one evaporator placed to intercept one between said first conveyance channel (40) and said second conveyance channel (41).

2. Display cabinet according to claim 1, **characterized in that** said ventilation means (5) are arranged

- in order to flow said air flow, in said first air conveyance channel (40), from said first passage opening (22') to said second passage opening (22"); and
- in order to flow said air flow (F), in said second conveyance channel (41), from said fourth passage opening (23") to said third passage opening (23').

3. Display cabinet according to claim 1 or 2, **characterized in that** said refrigerated containment chamber (21) comprises at least one bottom wall (22), which on the bottom delimits said refrigerated containment chamber (21) and on which at least said first passage opening (22') and said second passage opening (22") are obtained.

4. Display cabinet according to any one of the preceding claims, **characterized in that** said refrigerated containment chamber (21) comprises at least one upper wall (23) which on the top delimits said refrigerated containment chamber (21) and on which at least said third passage opening (23') and said fourth passage opening (23") are obtained.

5. Display cabinet according to any one of the preceding claims, **characterized in that** said evaporator is placed within one from between said first conveyance channel (40) and said second conveyance channel (41).

6. Display cabinet according to claim 5, **characterized in that** said evaporator is placed within said second conveyance channel (41).

7. Display cabinet according to any one of the preceding claims, **characterized in that** said ventilation means (5) are placed within one from between said first conveyance channel (40) and said second conveyance channel (41).

8. Display cabinet according to claim 7, **characterized in that** said ventilation means (5) are placed within said second conveyance channel (41).

9. Display cabinet according to any one of the preceding claims, **characterized in that** said dividing wall (30) is extended between a lower end (301) placed at said first conveyance channel (40) and an upper end (302) placed at said second conveyance channel (41);
wherein at least one between said lower end (30') and upper end (30") is closed.

10. Display cabinet according to any one of the preceding claims, **characterized in that** said dividing wall (30) comprises a single solid panel.

11. Display cabinet according to any one of the preceding claims, **characterized in that** said dividing wall (30) is provided with at least one passage slit (300).

12. Display cabinet according to any one of the preceding claims, **characterized in that** it comprises:

- a plurality of first shelves (31) fixed to said support structure (2) and placed in said first half-chamber (S1), one on top of the other and spaced from each other,
- a plurality of second shelves (32) fixed to said support structure (2) and placed in said second half-chamber (S2), one on top of the other and spaced from each other.

13. Display cabinet according to claims 11 and 12, **characterized in that** said dividing wall (30) is provided with multiple said passage slits (300) placed between said first and second shelves (31, 32).

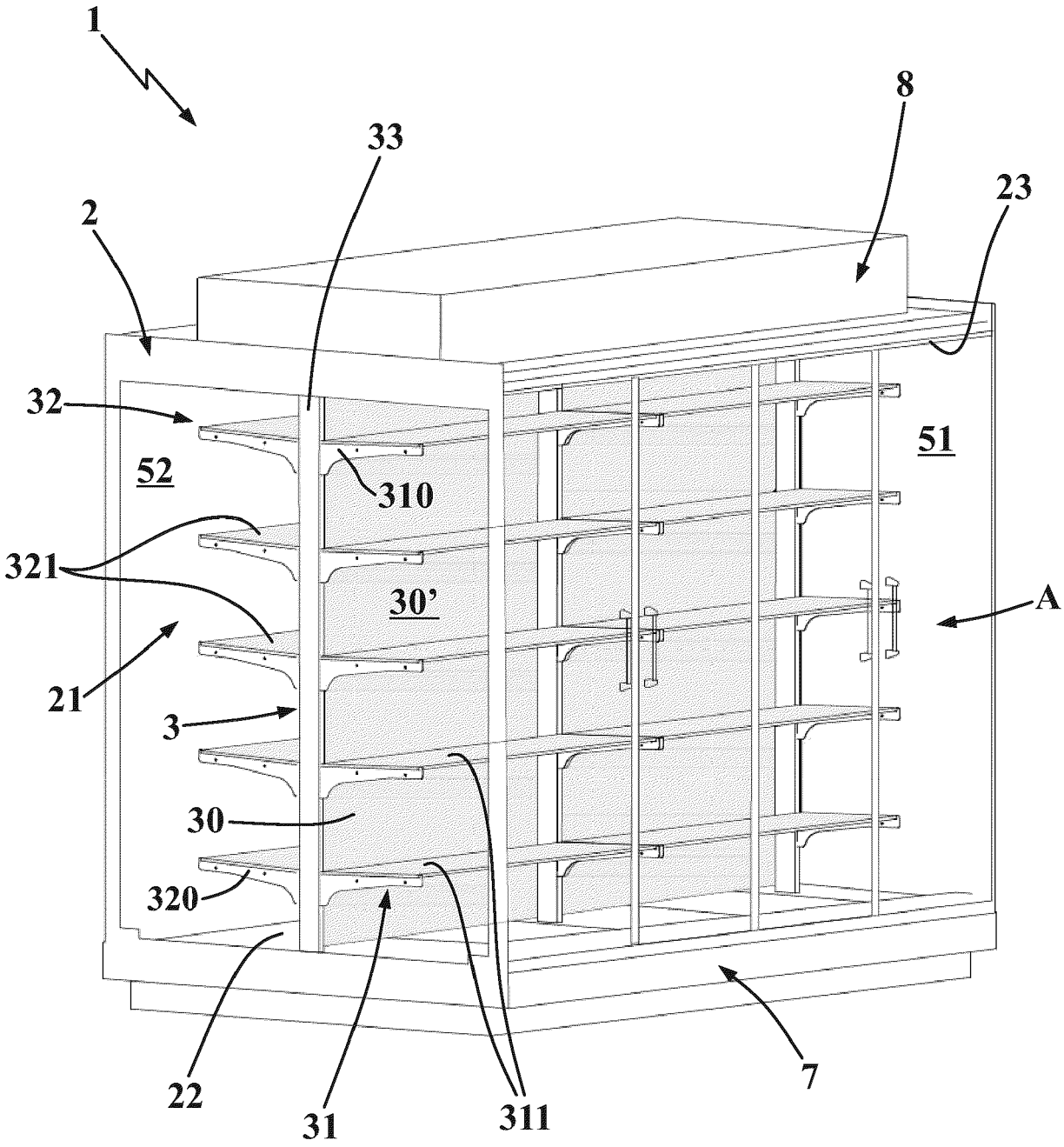

Fig. 1

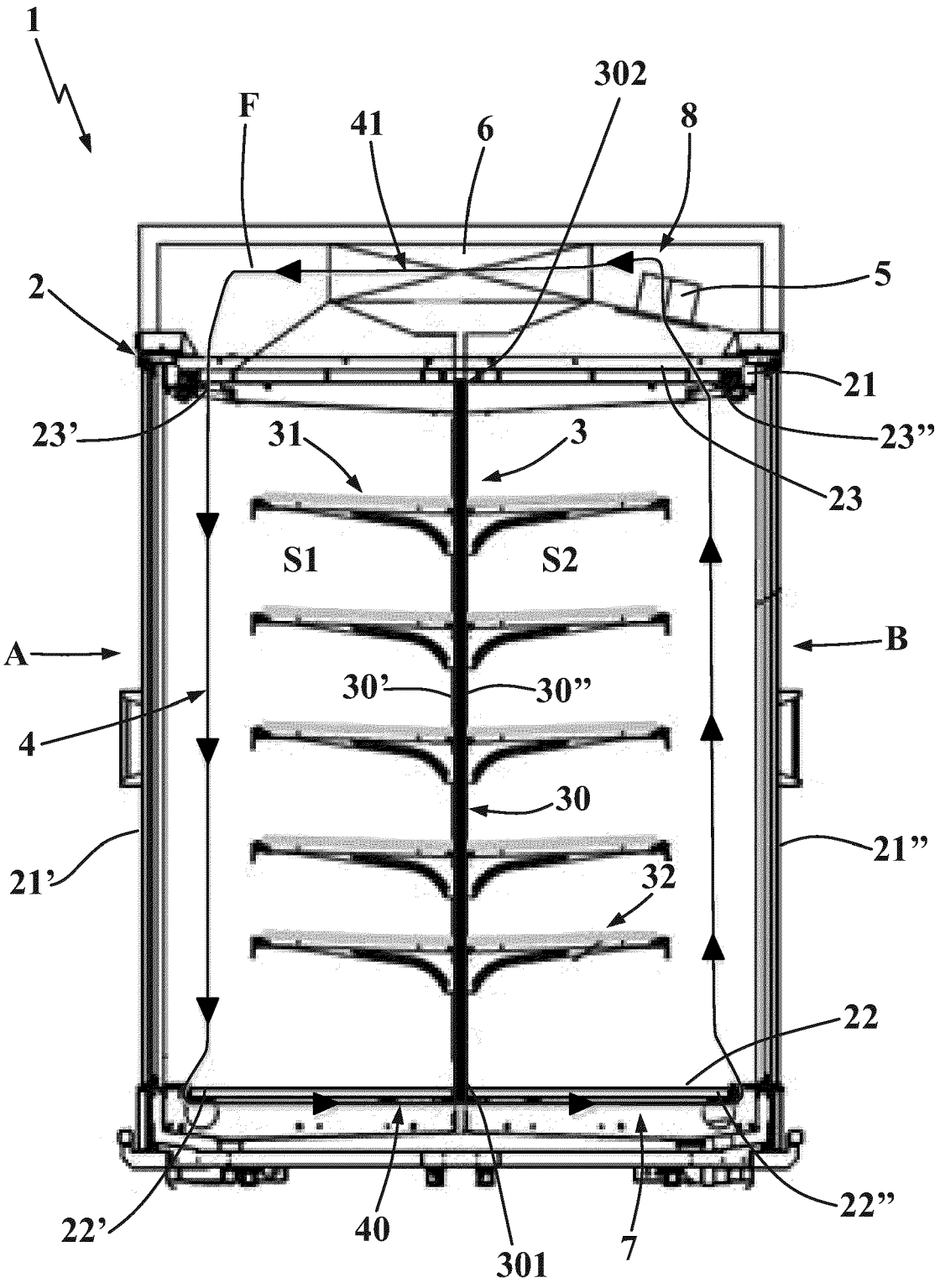
1
F
41
6
302
8
2
5
21
23'
23"
31
3
23
S1
S2
A
B
30'
30"
4
30
21'
21"
32
22
22'
40
301
7
22"

Fig. 2

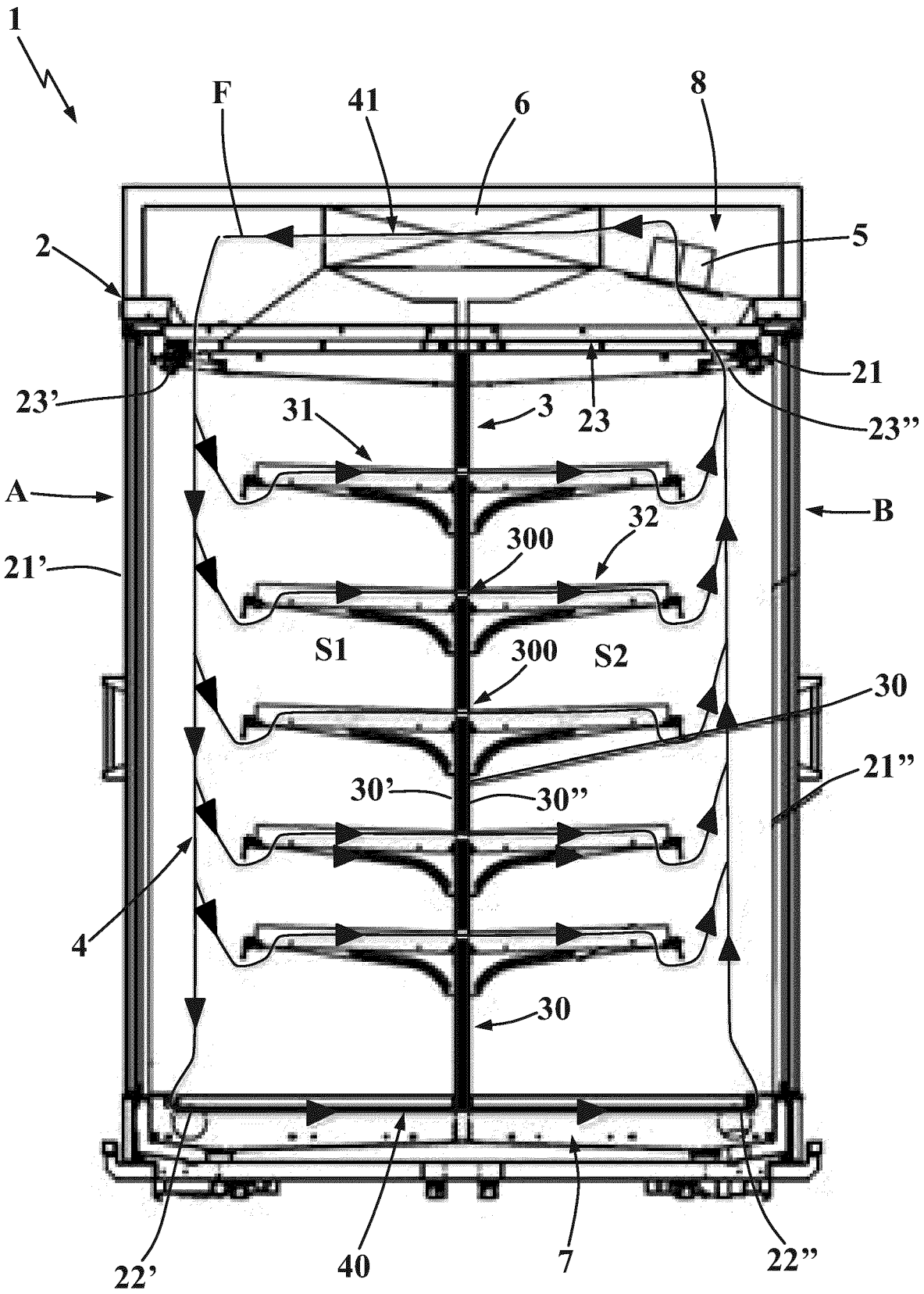
1
F
41
6
8
2
5
21
23'
31
3
23
23"
A
B
32
300
21'
S1
300
S2
30
21"
30'
30"
4
30
22'
40
7
22"

Fig. 3

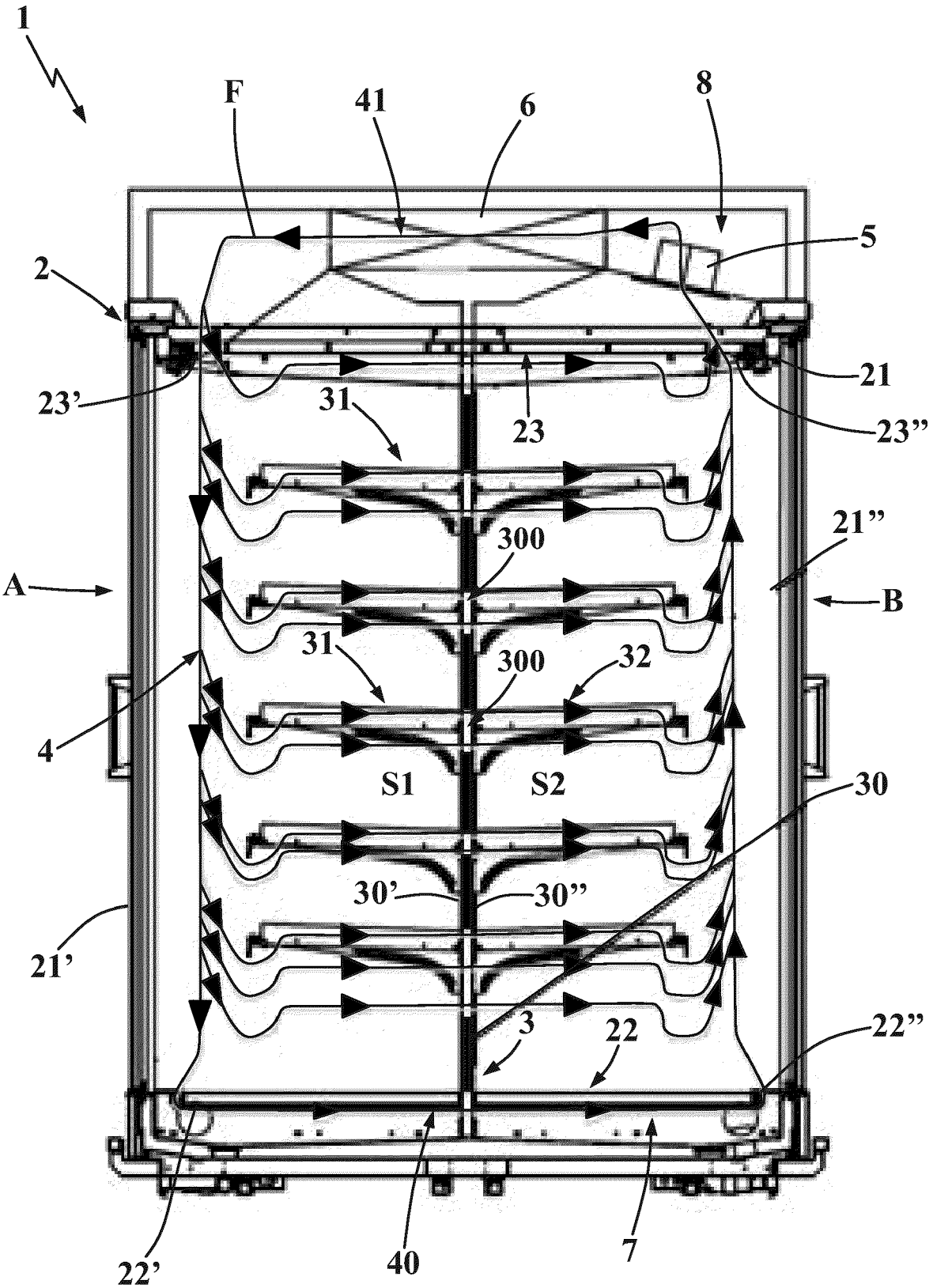
1
F
41
6
8
5
2
21
23'
31
23
23"
21"
300
A
B
31
300
32
4
S1
S2
30
30'
30"
21'
3
22
22"
22'
40
7

Fig. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 22 16 1312

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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	13 May 2022	Kolev, Ivelin

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