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(54) **Multifunctional support for shelves of refrigeration appliances or the like, particularly suitable for modular appliances**

(57) A support (1) for shelves (15, 16) of refrigeration appliances or the like, particularly suitable for modular appliances, comprising at least one conditioned temperature compartment (2) bounded by side walls (6, 7), an upper wall (4), lower wall (5) and rear wall (30),

said support being fixed to said side walls (5, 7) and presenting slots (12) for housing pins (14) of said shelves (15, 16), in which said support (1) defines at least one passage channel (10) for cables (22), ducts (20, 21), pressurized fluid and/or the like.

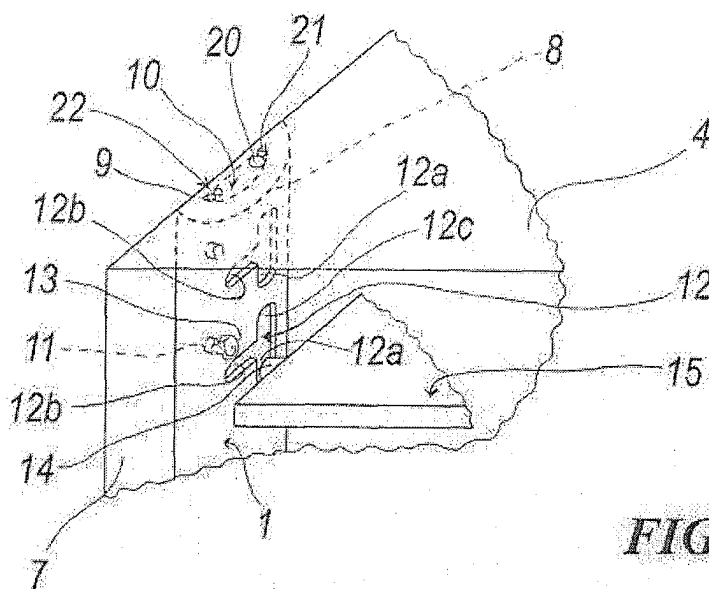


FIG. 6

Description

[0001] The present invention relates to a multifunctional support for shelves of refrigeration appliance, particularly suitable for modular appliances, in accordance with the introduction to the main claim. Specifically, the support is suitable for use with refrigeration appliances such as coolers, freezers or refrigerators, particularly of modular type, presenting at least one conditioned temperature compartment with smooth inner walls. Modular refrigerators are known to present smooth inner walls, given their particular conformation. In particular, the known modular refrigerator structures present one or more U-modules, consisting substantially of a pair of U-shaped walls, i.e. an inner and an outer, joined together by insulating material. When joined to an upper horizontal wall, to a lower wall and closed frontally by doors, these modules form conditioned temperature compartments in which foods or the like are preserved.

[0002] The U-modules are constructionally very simple and give good rigidity to the structure.

[0003] In refrigerators, and especially in modular refrigerators, electric cables, pipes for conveying the refrigerant fluid, or cooled air in the case of forced-air refrigerators, data transmission cables or the like have to be brought into the refrigerated compartments or in correspondence with them (for example to their door).

[0004] A further problem, especially of modular refrigerators, derives from the support system for the shelves inside the compartment.

[0005] A device suitable for this purpose, which also allows fine adjustment of the shelf height, is described in patent application M12003U000401, filed in the name of the same applicant.

[0006] This application describes a device comprising a pair of support elements with an elongated body presenting a plurality of recesses opening into a side of said body, said recesses being arranged to contain end projections on the shelves. The elongated bodies are applied by conventional fixing systems to the smooth inner walls of the refrigerated compartment.

[0007] This construction enables only the shelves to be supported. In addition, the support elements described in the previous filing do not extend along the entire height of the cells, but are positioned at different heights therein. Because of the constructional form of said support elements, the position discontinuity within the refrigerated compartment is essential in order to be able to mount the shelves therein.

[0008] An object of the present invention is to provide a multifunctional support for shelves of refrigeration appliances, particularly suitable for modular appliances, which performs the double function of shelf support and passage element for electric cables, refrigerant fluid pipes or compartment cooling air pipes.

[0009] A further object of the present invention is to provide a multifunctional shelf support which optimizes the use of the internal space of the refrigerated compart-

ment.

[0010] A further object of the present invention is to provide a multifunctional shelf support which facilitates cleaning of the refrigeration appliance.

[0011] These and other objects are attained by a multifunctional support for shelves of refrigeration appliances, particularly suitable for modular appliance, in accordance with the teachings of the accompanying claims. Further characteristics and advantages of the invention will be apparent from the description of different non-exclusive embodiments of the multifunctional support for shelves of refrigeration appliances, particularly suitable for modular appliances, illustrated by way of non-limiting example in the accompanying drawings, in which:

Figure 1 is a schematic perspective view of a refrigerated compartment in which the improved supports of the present invention are installed;

Figure 2 is a perspective view of one embodiment of the supports of Figure 1;

Figure 3 is a section taken on the plane 3-3 of Figure 2;

Figure 4 is a perspective view of a different embodiment of the supports of the present invention;

Figure 5 is a section taken on the plane 5-5 of Figure 4;

Figure 6 is a perspective view of a conventional refrigerator shelf housed in the support of Figure 2, showing refrigerant fluid transport pipes and a diode lamp inserted in the support;

Figure 7 is a side view of the support of Figure 2; and Figure 8 is a schematic side view of a wall of the refrigerator, of two supports of Figure 2 and of two different types of shelves housed in the supports.

[0012] Said figures show a multifunctional support for shelves of refrigeration appliances, particularly suitable for modular appliances, indicated overall by 1.

[0013] It is located in a compartment 2 at conditioned temperature, bounded laterally by a U-module 3 defining a rear wall 30 and two side walls 6, 7, and by an upper wall 4 and lower wall 5. The compartment 2 is closed frontally by a conventional door (not shown).

[0014] On the side walls 6 and 7 of the U-module 3 there are fixed four supports 1 facing each other in pairs, they extending continuously through the entire height of the side walls, from the lower wall 5 to the upper wall 4. The supports 1 are all identical, one of them being shown enlarged in Figure 2.

[0015] They present an elongated shape, with a rounded outer surface 8. Opposing the rounded surface there is a flat surface 9 which, when in use, rests on one of the inner side walls 6, 7 of the conditioned temperature compartment.

[0016] In the illustrated embodiment, the flat surface 9 is fixed (for example welded ultrasonically) to the wall of the refrigerated compartment; it can however be fixed

thereto by gluing, by threaded pins, by snap-insertion, etc.

[0017] Between the flat rear surface 9 and the rounded outer surface 8 a channel 10 is defined within which, when in use, electric cables, pressurized fluid, cold air or refrigerant fluid pipes etc. can be disposed and allowed to pass.

[0018] As the support 1 extends through the entire length of the wall so as to connect the lower wall 5 to the upper wall 4 of the compartment, it can also be used for passage of cables and conduits used for example for conditioning or controlling the temperature in the compartment or in different refrigerated compartments connected to that shown in Figure 1.

[0019] Hence, advantageously, cables and conduits no longer have to pass externally to the refrigerated compartment, for example on the rear outer wall of the refrigeration appliance. Alternatively, it is no longer necessary to provide openings in the wall 30 for the exit of forced air into the compartment 2.

[0020] In the illustrated embodiment each support 1 presents through holes 11 providing communication between the environment in the refrigerated compartment and the channel 10. These are particularly useful for the passage for example of cold air forcibly fed in known manner into the channel 10. This air enables the compartment to be cooled by a forced-air system (also known as no-frost).

[0021] Advantageously some of said through holes 11 can house light emitting diodes 13 suitably powered by electric cables passing through the channel 10, temperature sensors, humidity sensors or the like.

[0022] Slots 12 of prostrate T-shape are provided in the rounded outer surface 8 of the support 1. As shown in Figure 3 these slots 12 do not pass through the material and are not in communication with the channel 10.

[0023] The slots 12, of T-shape in the described embodiment (or of any other appropriate shape, for example L-shape) are provided to house pins 14 provided on conventional shelves 15. These slots present a substantially horizontal portion 12b, a well 12a positioned lower than the horizontal portion 12b and a vertical portion 12c aligned with the well and facilitating the insertion of the shelf 15, and specifically of the pins 14 projecting from it. The shelf 15, with its four pins 14 inserted into the slots 12 of four identical supports 1 fixed to the side walls of the conditioned temperature compartment 2, is well supported and stable.

[0024] Specifically, the T-shape of the slots 12 enables the pins 14 to be inserted into them by slightly inclining the shelf. With the shelf 15 finally lying horizontally, at least two of the pins 14 will be housed in the wells 12a of the slots.

[0025] When in this position, conventional shelves 15 are well fixed and stable, whether these are shelves 15 with aligned side pins, such as that shown below in Figure 8, or special shelves 16 with offset pins, such as that shown above in Figure 8.

[0026] When in use, with these latter shelves the front pins are housed in the wells 12a, whereas the rear pins remain in the horizontal portion. Such special shelves 16 are well secured, even against vertically directed forces.

[0027] Supports 1, such as the aforescribed, are particularly advantageous as they perform the double function of housing the pins 14 supporting the shelves 15, or the special shelves 16, while at the same time providing a housing for cables, conduits and the like, within the channels 10.

[0028] In Figure 6 the channel 10 can be seen to house the outward pipe 21 and return pipe 20 for refrigerant fluid fed to an evaporator of a conditioned temperature compartment lying above the compartment 2 (but not shown), and the cables 22 for powering the diode 13. Forced air also flows through the channel 10, to reach the compartment 2 through the apertures 11 and condition its temperature.

[0029] A different embodiment of the support 1 is indicated by 1a and shown in Figures 4 and 5. It does not comprise the rear flat surface, the channel 10 being provided between the outer rounded surface 8 and the side wall of the refrigerated compartment.

[0030] The described supports 1, 1a are rounded, however they can advantageously be of any shape, for example U-shape.

[0031] Two preferred embodiments have been illustrated, however others can be conceived using the same inventive concept.

Claims

1. A support (1) for shelves (15, 16) of refrigeration appliances or the like, particularly suitable for modular appliances, comprising at least one conditioned temperature compartment (2) bounded by side walls (6, 7), an upper wall (4), lower wall (5) and rear wall (30), said support being fixed to said side walls (5, 7) and presenting slots (12) for housing pins (14) of said shelves (15, 16), **characterised in that** said support (1) defines at least one passage channel (10) for cables (22), ducts (20, 21), pressurized fluid and/or the like.
2. A support as claimed in claim 1, **characterised in that** said channel (10) is provided directly within said support, between a rear flat surface (9) and an outer surface (8).
3. A support as claimed in claim 1, **characterised in that** said channel (10) is defined between the outer surface (8) of said support and said side wall (6, 7) of the conditioned temperature compartment (2).
4. A support as claimed in claim 1, **characterised by** comprising through holes (11) opening into said

channel (10).

5. A support as claimed in claim 4, **characterised by**
comprising diodes (13) housed in said holes (11). 5
6. A support as claimed in claim 4, **characterised by**
comprising temperature sensors housed in said
holes (11).
7. A support as claimed in claim 4, **characterised in** 10
that said holes (11) act as passages for cold forced
air fed into the channel (10) in order to condition the
temperature of the compartment (2).
8. A support as claimed in claim 1, **characterised in** 15
that said supports (1) extend through the entire
height of the side wall (6, 7), from the lower wall (5)
to the upper wall (4).
9. A support as claimed in claim 1, **characterised in** 20
that said support (1) is fixed to said walls (6, 7) by
ultrasonic welding, gluing or fixing pins.
10. A support as claimed in claim 1, **characterised in** 25
that said slots (12) are blind, are of prostrate T-
shape, and present a substantially horizontal por-
tion (12b), a well (12a) and a substantially vertical
portion (12c) above said well, the vertical portion
(12c) facilitating insertion of said pins (14) of the
shelf (15, 16). 30

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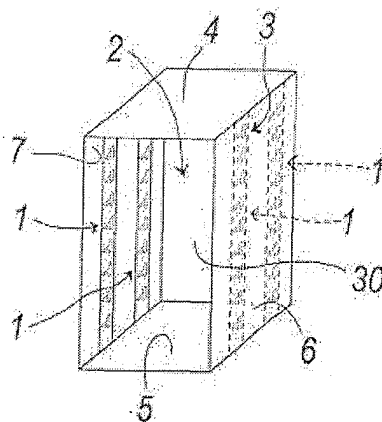


FIG. 1

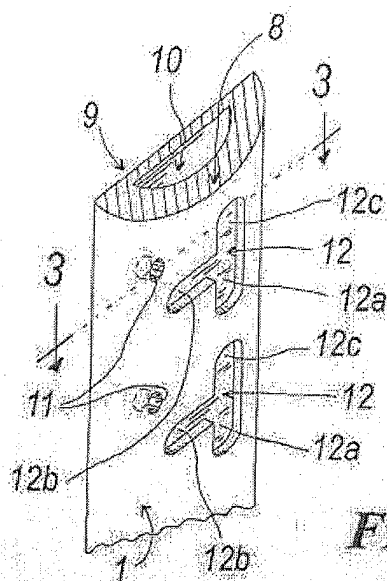


FIG. 2

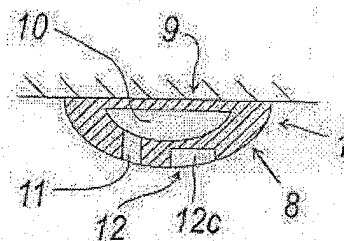


FIG. 3

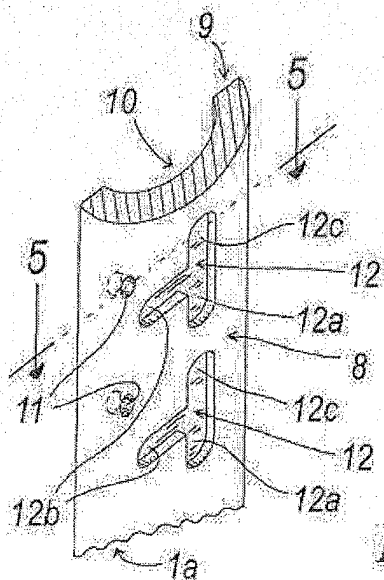


FIG. 4

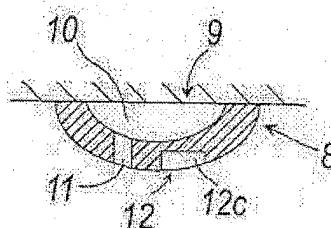
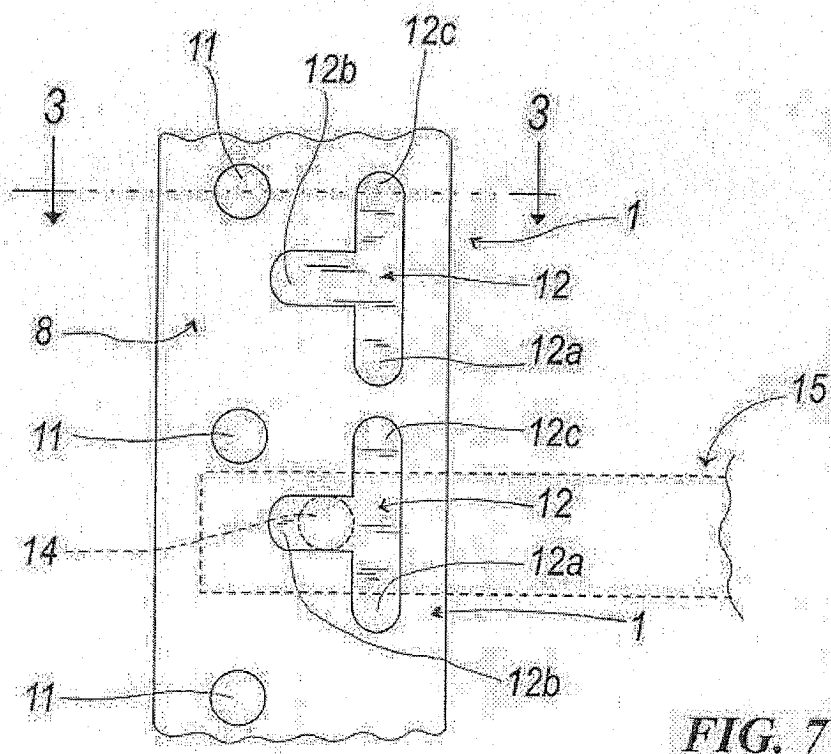
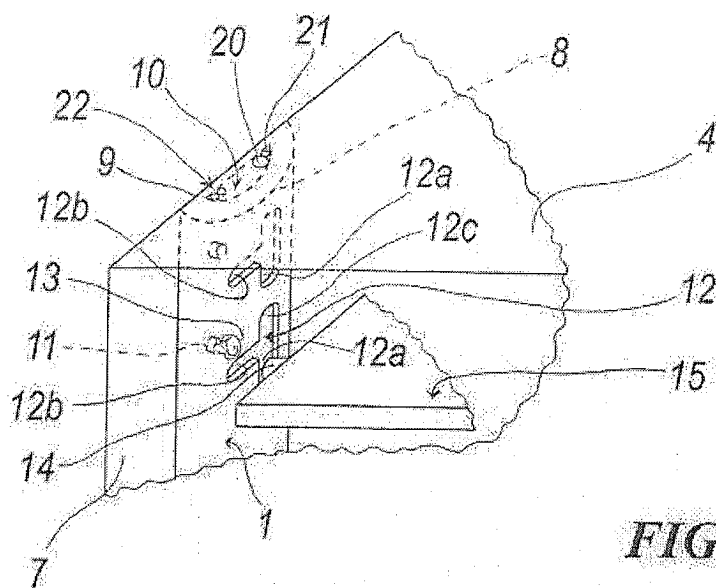


FIG. 5



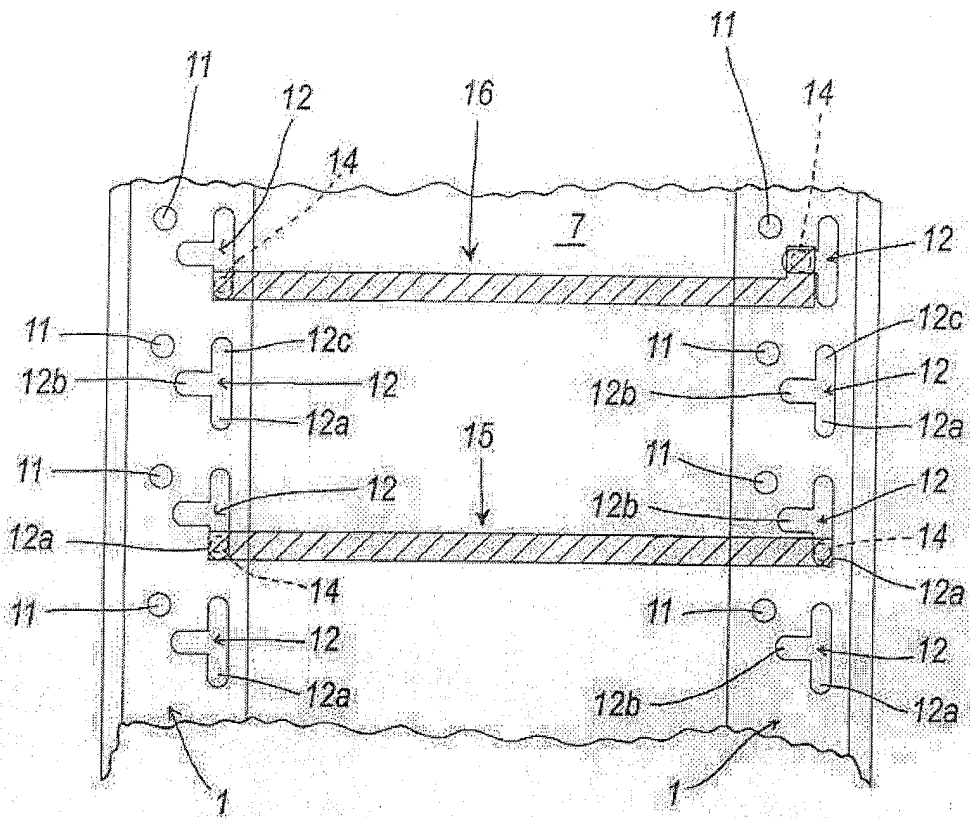


FIG. 8