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(54) **Improved door for display units, in particular for refrigerators**

(57) This invention proposes a door (3) for display units (1), such as refrigerators or the like, of the kind used in points of sale, consisting of a double-glazing unit (4) made of transparent material and a series of luminous elements (6), in particular LEDs, suitable to lighten the inner part of the refrigerator (1) on which the door (3) is fitted, in such a way as to enable the user to easily view

the displayed products.

In particular, supporting structure (5) of the double-glazing unit (4) is made of a sectional shape having at least a part made of transparent material, and the said lighting means (6) consist of a plurality of LEDs placed between the said double-glazing unit (4) and the said transparent side wall of the section.

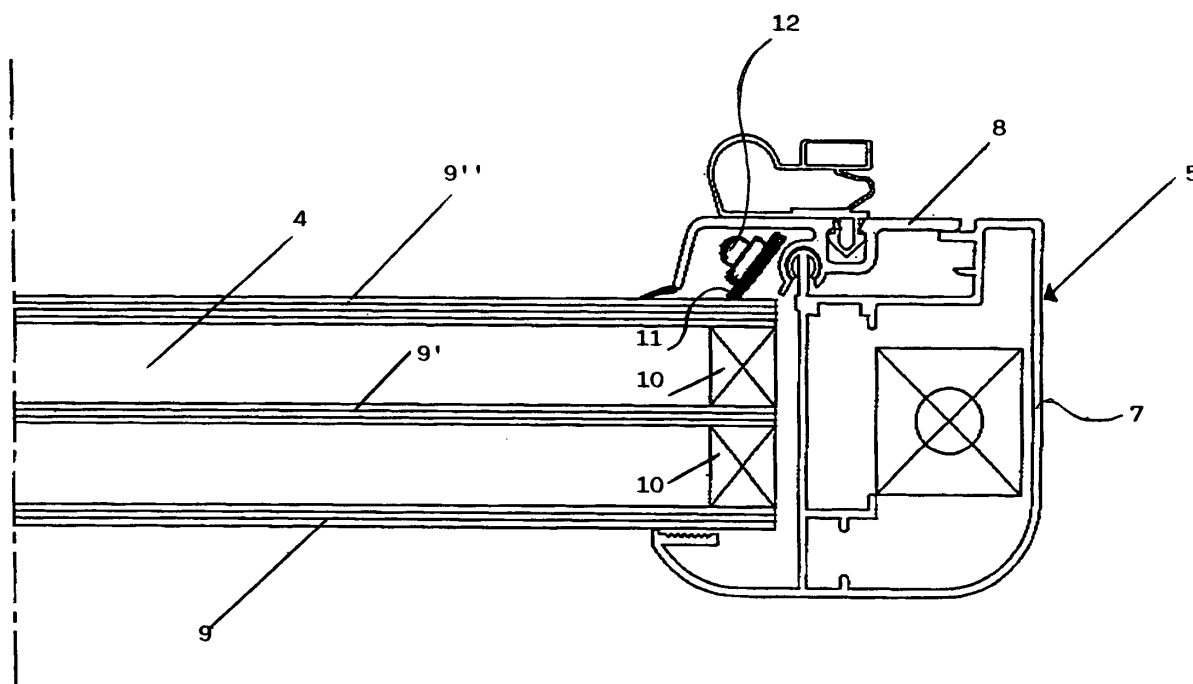


FIG. 2

Description

[0001] This invention proposes a door for display units, such as refrigerators or the like, of the kind used in points of sale, consisting of a double-glazing unit made of transparent material and a series of luminous elements, in particular LEDs, suitable to lighten the inner part of the refrigerator on which the door is fitted, in such a way as to enable the user to easily view the displayed products.

[0002] The door is characterised by the particular arrangement of the parts, which provides for LEDs installed on a support fitted inside the sectional shape which creates the door frame, outside the double-glazing unit.

[0003] This inventive idea turns out to be easier and more economical than the prior art solutions which provide for the use of LEDs still fitted in the double-glazing unit, with noticeable advantages resulting, beside from lower production costs, also from an easier maintenance.

[0004] In order to preserve perishable foods, the department stores, bars or other points of sale are used to store them in refrigerators provided with a front door made of transparent material, in order to enable the customers to view the products displayed inside.

[0005] However, these systems need to be equipped with lightening systems capable of duly displaying the displayed products, even when such products are placed, for example, in the rear part, where the natural light or the lighting level of the environment wherein the displays are installed are not generally enough to duly lighten the displayed products.

[0006] According to the prior art, refrigerators provided with one or more neon lights installed inside the system and able to offer a good lighting of the products are often used.

[0007] This solution has, on the other hand, several disadvantages, because the use of neon lights implies the need to equip the inside of the refrigerators, in an area which is generally accessible to the user, with an electric system working with a network voltage and which must be duly insulated and made in such a way as to prevent any accident risk.

[0008] Beside that, the said systems occupy an area which decreases the usable area of the system itself.

[0009] A solution to this problem is offered by the Italian application for utility model No MI2004U 000455 filed on 8th October 2004 by the same applicant.

[0010] This application describes a luminous door for display units, in particular for refrigerators, with a side of it consisting of a double-glazing unit made of transparent material provided with a LEDs lighting system fitted to the inside edge of the double-glazing unit gasket, in such a way as to direct the light flux inside the display unit and to eliminate the bulky lighting neon systems of the prior art.

[0011] The said inventive idea turned out to be subject to further improvements and this invention concerns an improved door for display units, wherein the LEDs are mounted on a support fitted inside the sectional shape

which creates the door frame, but outside the double-glazing unit.

[0012] This embodiment, on the one hand, makes the construction of the door easier, thus avoiding the complexities and the costs deriving from the need to fit the LEDs inside the double-glazing unit, and on the other hand, reduces the reflections of light between the double-glazing unit sheets, thus improving still the visibility for the customer.

[0013] This invention will be described below in detail, only by way of example but without any limitation thereto, with reference to the figures annexed hereto, in which:

- figure 1 is a schematic perspective view of a display unit provided with a door according to the invention;
- figure 2 is a partial section of a door made in compliance with the invention.

[0014] With reference to the figure 1, numeral 1 indicates in the whole a display unit, in particular a refrigerator, provided in its inside with a plurality of shelves 2 for displaying the products on sale and having its frontal side closed by a door 3 made in compliance with the invention.

[0015] More particularly, the door 3 consists of a double-glazing unit made of transparent material indicated as 4, fitted on a framework 5, which is hinged to the display unit body and equipped with lighting systems 6, consisting of a plurality of LEDs and which are better shown by the section of figure 2.

[0016] As shown by figure 2, the framework 5 of the door is made of the combination of more sectional shapes, in the case in point a couple of sectional shapes indicated as 7 and 8 respectively, between which the double-glazing unit 4 is clamped, which double-glazing unit in the case at issue consists of three sheets made of transparent material 9, 9', 9'', with perimetrical gaskets 10.

[0017] According to the invention, the sectional shape 8 is made of material transparent to light and inside the structure 5, into the hollow between the sectional shape 8 and the double-glazing unit 4, a support 11 is fitted into on which a plurality of lightening devices, in particular LEDs 12, is fitted.

[0018] The LEDs turned out to be particularly suitable for this application, both because of their small dimensions they can be easily fitted inside the sectional shapes which are generally used for manufacturing doors, and because, since they are powered by a few volts tension, they do not give rise to safety problems and do not require particular insulations.

[0019] The support 11 can be fixed, according to prior art technology, to the sheet 9'' of the double-glazing unit or to the sectional shape 8, otherwise a removable support 11, fitted into slides (not shown) made in the section, may be provided.

[0020] The support 11 is preferably tilted towards the inside of the display unit, in such a way as to direct the light flux emitted by the LEDs on the displayed products.

[0021] This way, the products shall be perfectly lightened both by the LEDs direct light, and by the indirect light reflected by the display unit inside walls, thus guaranteeing a good visibility both of the products closer to the door and those placed in the inside, placed in the rear part of the display unit.

[0022] The power supply, current at lower voltage, may get to the inside of the sectional shape through cables or, otherwise, through sliding contacts or other known systems.

[0023] This way, the inside part of the refrigerators may be lightened without the need for bulky and dangerous electric systems to be installed in the areas accessible to the public.

[0024] In addition to the foregoing, since the LEDs are powered by current at very low voltage, ranging between 5 and 24 Volts, the display unit is safe and practically free from risks and accidents due to malfunctions or failures in the lighting system.

[0025] A further advantage, resulting from the use of LEDs and their location inside the door, derives from the fact that the heat released by the system is extraordinarily lower than those of the lamps and is unable to have effects on the displayed products. Also the expenditure of energy will turn out to be lower than those of the prior art systems equipped with neon lights.

[0026] As it will be clear from the description above, the door according to the invention turns out to be particularly easy to assembly, since the lighting system does not require complex assembly operations but can be simply fitted inside the door framework, between the sectional shape and the double-glazing unit, or by applying it to one of these two elements before the sectional shapes which create the framework are assembled together.

[0027] A skilled in the art may make changes and different versions, which must be all considered included within the competence of this invention.

[0028] For example the LEDs, even though still fitted between the double-glazing unit and the door transparent sectional shape, instead of being fitted on a separate support, may be directly mounted on the sectional shape, for example by fitting them into a corresponding series of holes made in such a way as to contain a single LED.

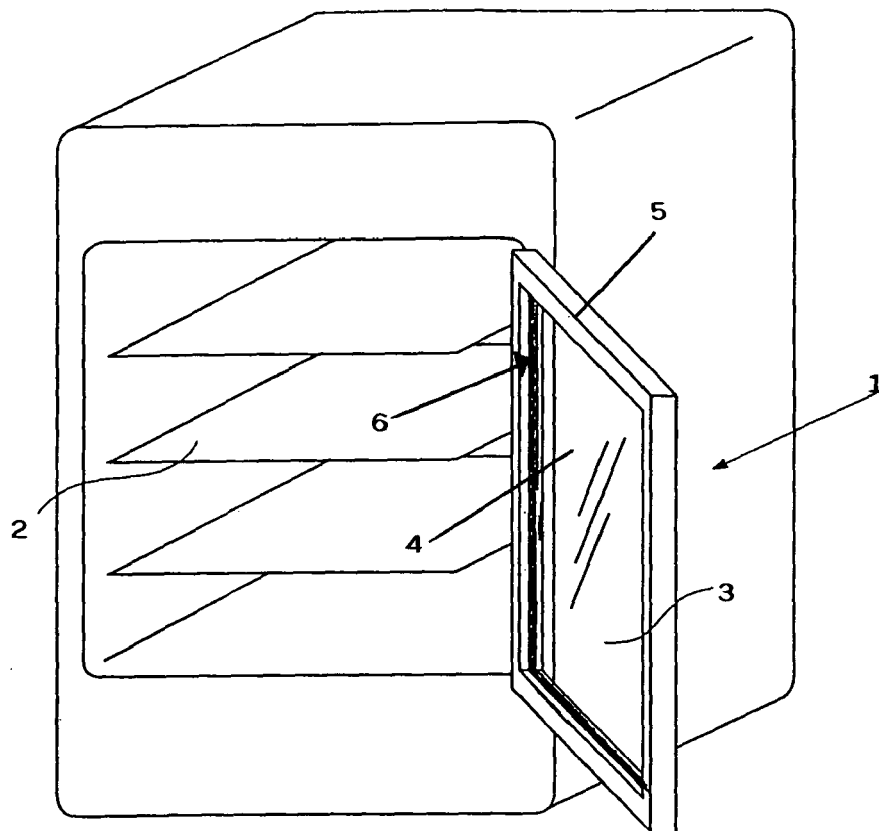
[0029] Analogously, the inventive idea may be applied, in addition to hinged doors as the one shown in the figure, also to sliding doors, both vertical and horizontal, of the kind fitted on the deep-freeze counters used in the supermarkets.

double-glazing unit.

2. Door according to the claim 1, **characterised in that** the said supporting structure of the double-glazing unit consists of a sectional shape having at least a part made of transparent material, and the said lighting means consist of a plurality of LEDs placed between the said double-glazing unit and the said transparent part of the section.
3. Door according to the claim 2, **characterised in that** the structure is made of two joined together sectional shapes, of which at least the one which, when the door is closed is in the inside part of the display unit, is made of transparent material.
4. Door according to any of the above listed claims, **characterised in that** the LEDs are fitted on a support placed between the said side wall made of transparent material and the sectional shape which constitutes the supporting structure of the said transparent side wall.
5. Door according to the claim 4, **characterised in that** the said LEDs support is fitted to the sectional shape.
6. Door according to the claim 4, **characterised in that** the said LEDs support is fitted to the side wall made of transparent material.
7. Door according to any of the claims from 1 through 4, **characterised in that** the said LEDs are fitted on a removable support.
8. Display unit, in particular a refrigerator, **characterised in that** it is provided with a door according to any of the claims from 1 through 7.

Claims

1. Door provided with transparent door in particular a double-glazing unit, for displays, refrigerators and the like, **characterised in that** it comprises means for lighting the inside of the display or refrigerator unit, placed in the supporting structure of the said



F I G. 1

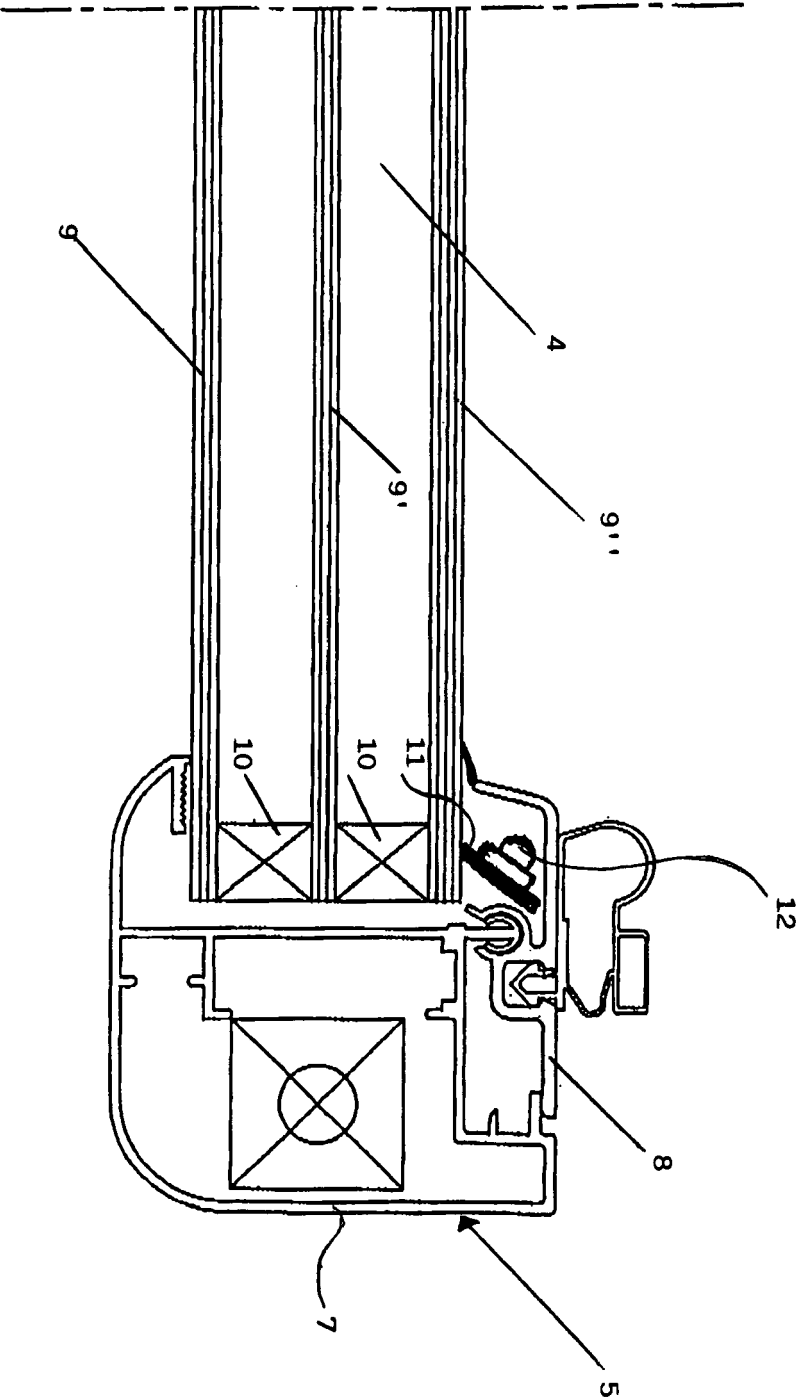


FIG. 2

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- IT MI2004 U [0009]
- IT 000455 U [0009]