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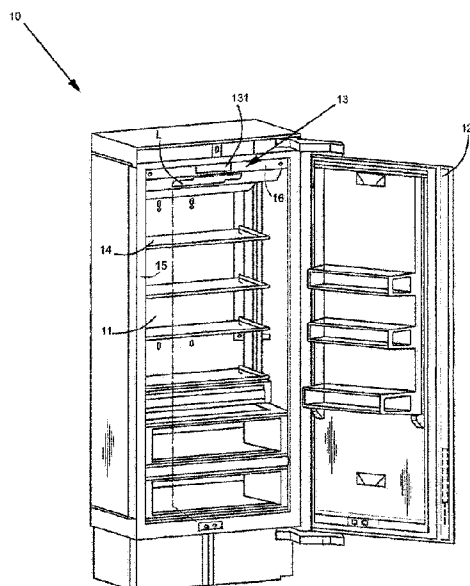
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(54) Title: A COOLING DEVICE



Figur 1

(57) Abstract: The present invention relates to a cooling device (10) and particularly a refrigerator comprising an illumination unit (13) which provides a liner (11), which is accessed when a door (12) is opened, to be illuminated with a first light color; and at least one sensor (131) which detects the light intensity of the outer environment. Said cooling device is characterized by comprising at least one illumination member which is configured so as to change the illumination unit's (13) light color to a second light color, in case the light intensity falls under a predetermined value according to the light intensity data of the outer environment provided by the sensor (131).

SPECIFICATION

A COOLING DEVICE

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The present invention relates to a cooling device and particularly relates to a refrigerator comprising an illumination unit which provides a liner, which is accessed when a door is opened, to be illuminated with a first light color; and at least one sensor which detects the light intensity of the outer environment.

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KNOWN STATE OF THE ART

Cooling devices are devices which keep foodstuff fresh for certain time duration. The products are placed onto the shelves which are positioned inside the cooling device liner.

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Depending on the dimensions of the liner, products are placed on the shelf's front side which is close to the door, or the products are placed to the shelf's rear side which is far from the door. The products, which are positioned behind the shelf, remain in the region inside the liner where there is less illumination. When the door is opened, the natural illumination, arriving from the outer environment, hits the products positioned at the front side of the shelf and it does not reach the rear sides of the shelf. In order to prevent this situation, illumination units are adapted inside the cooling device liners. By means of this; when the door is opened, the illumination units are activated, and the illumination units will adjust the illumination inside the liner.

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There are pluralities of embodiments in order to provide the illumination to be more efficient. In the patent application JP2008070000, a lighting device is disclosed where a detector is adapted. The detector detects the light intensity of the outer environment and depending on this, the detector provides the adjustment of the light intensity of the lamps in the illumination unit. In another patent application DE102008058022, an illumination unit is disclosed which changes the illumination amount inside the liner depending on the time duration which the door remains open. Accordingly, depending on the time duration which the door remains open, the light tones inside the liner will be changed and the user will be warned. In both applications, the object is to change the illumination units' light intensity and to warn the user depending on this. The change in the light intensity of the lamps which are connected to the illumination unit may affect the lifetime of the lamps and it may damage the electrical circuit forming the illumination unit.

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Because of the abovementioned drawbacks, an improvement is required for the illumination units providing illumination inside the liner.

BRIEF DESCRIPTION OF THE INVENTION

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The present invention relates to an illumination unit which is used in the illumination of inside of the liner, in order to eliminate the drawbacks in the abovementioned present systems and in order to bring new advantages to the related technical field.

- 10 An object of the subject matter invention is to provide an illumination system which turns on the related lamp, which has at least two different light colors, depending on the light amount of the outer environment.

- Another object of the subject matter invention is to provide an illumination mechanism
15 which provides inside of the liner to be illuminated in a better manner in case the outer environment is dark and which provides the items to be cooled to be detected by the user in a clearer manner.

- In order to realize the abovementioned objects and the objects which will be obtained from
20 the detailed description below, the present invention relates to a cooling device and particularly relates to a refrigerator comprising an illumination unit which provides a liner, which is accessed when a door is opened, to be illuminated with a first light color; and at least one sensor which detects the light intensity of the outer environment. Said cooling device is characterized by comprising at least one illumination member which is
25 configured so as to change the illumination unit's light color to a second light color, in case the light intensity falls under a predetermined value according to the light intensity data of the outer environment provided by the sensor.

- In another preferred embodiment of the subject matter invention, a control unit is provided
30 which provides change in the light color and which is connected to the illumination unit.

In another preferred embodiment of the subject matter invention, at least one LED is provided which has a first or second light color, according to the signals received from the control unit of the illumination unit.

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In another preferred embodiment of the subject matter invention, the illumination unit comprises at least one first lamp which has first light color and at least one second lamp which has second light color.

- 5 In another preferred embodiment of the subject matter invention, the first light color is darker than the second light color.

In another preferred embodiment of the subject matter invention, the control unit drives the illumination unit so as to give out light with first light color when the outer environment
10 is dark and so as to give out light with second light color when the outer environment is luminous.

In another preferred embodiment of the subject matter invention, the sensor is a photo transistor and accordingly, the second lamp is driven by said photo transistor.

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In another preferred embodiment of the subject matter invention, said control unit comprises another transistor which drives said second lamp and which is driven by said photo transistor.

- 20 In another preferred embodiment of the subject matter invention, at least said sensor is provided on the upper edge of the front frame of the cooling device facing outwardly. By means of this, the illumination unit is provided to be at an important point inside the liner. By means of this, the inside of the liner is illuminated in a more efficient manner.

25 **BRIEF DESCRIPTION OF THE FIGURES**

In Figure 1, the general view of the cooling device is given.

- In Figure 2, the general view of the circuit forming the illumination unit adapted to the
30 cooling device liner is given.

REFERENCE NUMBERS

- 10 Cooling device
35 11 Liner
12 Door

- 13 Illumination Unit
 - 131 Sensor
 - 14 Shelf
 - 15 Front Frame
 - 5 16 Upper Edge
- A: Separation Point
- B: Joining Point
- E: Power Supply
- K: Line
- 10 L: Lamp
 - L1: First lamp which gives out dark light
 - L2: Second lamp which gives out light color
- R: Resistance
- T1: Photo Transistor
- 15 T2: Transistor

THE DETAILED DESCRIPTION OF THE INVENTION

In this detailed explanation, the subject matter improvement is explained with references to the annexed figures without forming any restrictive effect in order to make the subject more understandable. Accordingly, in the detailed description below, the illumination unit 13 which is adapted inside the cooling device 10 liner 11 and the structural details forming the illumination unit 13 are described.

With reference to Figure 1, the general view of a representative cooling device 10 is given. Accordingly, the cooling device 10 comprises a door 12 and a liner 11 where access is provided after said door 12 is brought to the open position. Inside said liner 11, there are pluralities of shelves 14 which are positioned as required. There are illumination units 13 which are adapted to suitable points inside the liner 11. The illumination unit 13 has a sensor 131 and a lamp L. The sensor 131 detects a light intensity of an outer environment. Said illumination unit 13 is positioned at the upper edge 16 of the front frame 15 which defines the liner 11.

With reference to Figure 2, the general view of the electrical circuit forming the illumination unit 13 is given. The circuit, forming the illumination unit 13, has a power supply E. The power, exiting the power supply E, is transferred by means of conductive cables. There is

a first lamp L1 and a second lamp L2 connected to each other in a parallel manner on the circuit. The first lamp L1 has a darker light color when compared with the second lamp L2. On the circuit, there is a photo transistor T1 which is positioned before the first lamp L1 and there is a transistor T2 which is positioned before the second lamp L2. There is a
5 resistance R on the line where the first lamp L1 exists; and there is a line K which is positioned after said resistance R.

With reference to Figure 2, the operation of the circuit is as follows. The electrical current, exiting the power supply E, moves towards the separation point A. The electrical current,
10 reaching the separation point A, moves through the line where the resistance R exists, since the transistor T2 is in the turned on position. When the outer environment is dark, the photo transistor T1 turns on and completes the circuit. The electrical current, passing through the resistance R, moves towards the line K and towards the photo transistor T1. The electrical current, passing through the photo transistor T1, activates the first lamp L1.
15 Afterwards, the electrical current which moves towards the joining point B, reaches the power supply E again and the electrical current completes the movement thereof on the circuit.

The electrical current passing through the separation point A continues through the line
20 where the resistance R exists, since the transistor T2 is in the turned on position. If the outer environment is luminous, the photo transistor T1 remains in turned on position. In this case, whole of the electrical current passes through the resistance R, and afterwards, it is accumulated on the line K. This leads to a voltage accumulation on the end part of the line K. The voltage, accumulated on the line K, provides the transistor T2 to be brought to
25 the turned off position. After the transistor T2 is brought to the turned off position, the electrical current passes through the transistor T2 and continues the path thereof. The electrical current, which activates the second lamp L2, moves towards the joining point B. The electrical current passing the joining point B reaches the power supply E and thereby it completes the circuit.

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Under the light of the abovementioned description, the operation of said cooling device 10
is as follows. When the user opens the cooling device 10 door 12, the illumination unit becomes active. The power supply E begins producing power. The suitable lamp L, according to the illumination condition of the outer environment, becomes active. If the
35 outer environment is dark, the photo transistor T1 is brought to the turned off position and the first lamp L1 begins functioning. If the outer environment is luminous, the transistor T2

is brought to the turned off position and the second lamp L2 is activated. The transistor T1 detects the light intensity of the outer environment and also controls the first lamp L1.

5 By means of this, when the user opens the cooling device 10 door 12, the light intensity of the outer environment is sensed, and the lamp L, which will provide the suitable contrast, will be activated. By means of this, the products, which exist inside the cooling device 10 liner 11, become more apparent and they can be selected by the user.

10 Inside the alternative embodiment of the abovementioned illumination unit 13, there may also be an integrated circuit which can communicate with an external photo transistor which controls the lamps L. By means of this, the light intensity of the outer environment can be determined, and the lamp L, which has the suitable light color, can be turned on. In a similar manner, the control of the lamps L can be realized by means of the microprocessors. The microprocessors, which have the suitable conditions, can turn on
15 the related lamp L. The lamps L, which are to be used in the illumination unit 13, can be LED, or they can be any standard lamp. The preference of lamp L type can be determined according to user requirements.

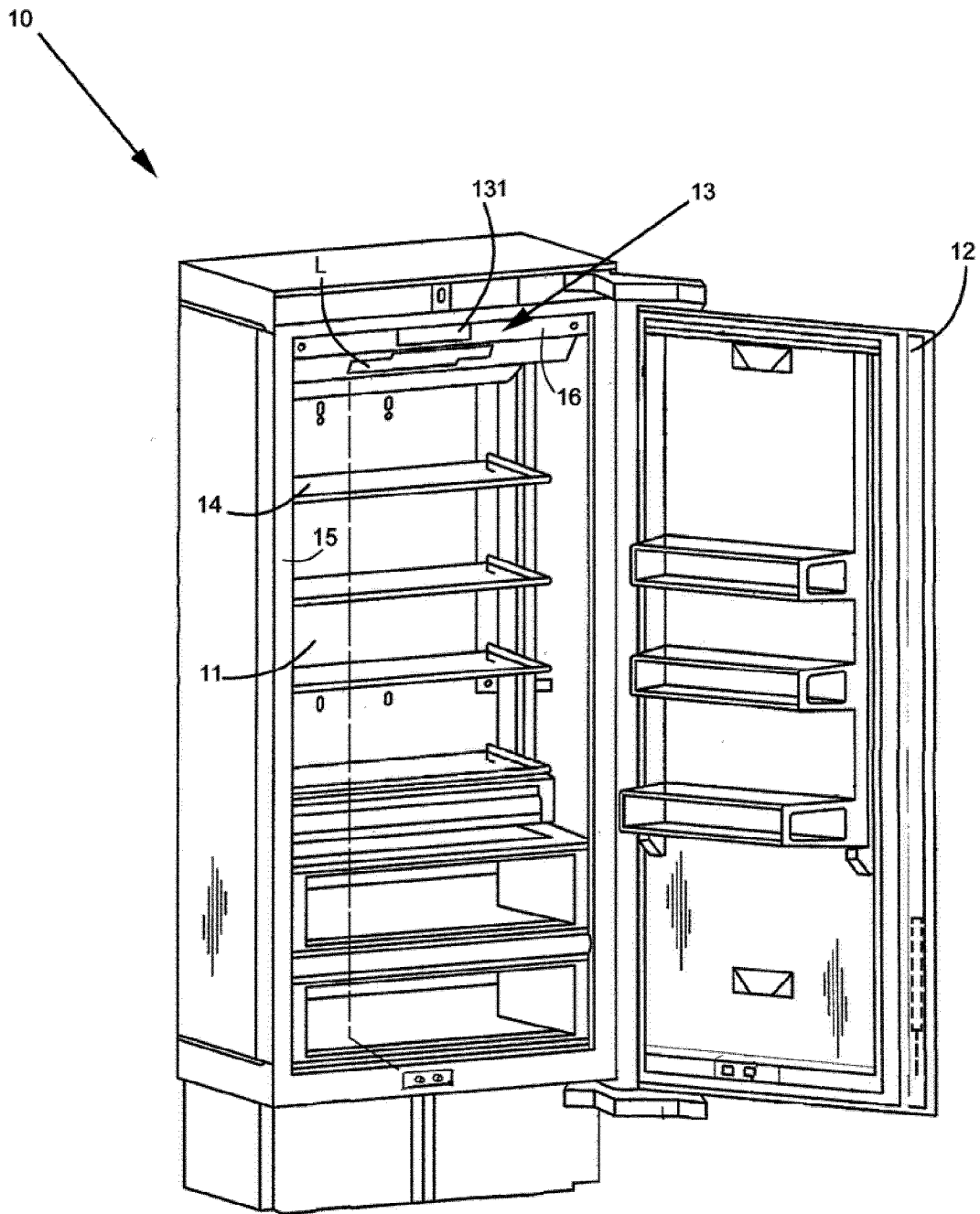
As a result, the protection scope of the present invention is set forth in the annexed
20 Claims and cannot be restricted to the illustrative disclosures given above, under the detailed description. It is because a person skilled in the relevant art can obviously produce similar embodiments under the light of the foregoing disclosures, without departing from the main principles of the present invention.

CLAIMS

1. A cooling device (10) and particularly a refrigerator comprising an illumination unit (13) which provides a liner (11), which is accessed when a door (12) is opened, to be illuminated with a first light color; and at least one sensor (131) which detects a light intensity of an outer environment, characterized by comprising at least one illumination member which is configured so as to change the illumination unit's (13) light color to a second light color, in case the light intensity falls under a predetermined value according to light intensity data of the outer environment provided by the sensor (131).
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2. A cooling device according to Claim 1, wherein a control unit of the illumination unit (13) is provided which provides change in the light color and which is connected to the illumination unit (13).
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3. A cooling device according to Claim 1, wherein at least one LED is provided which has a first or second light color, according to the signals received from the control unit of the illumination unit (13).
15
4. A cooling device according to Claim 1, wherein the illumination unit (13) comprises at least one first lamp (L1) which has first light color and at least one second lamp (L2) which has second light color.
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5. A cooling device according to any one of the preceding claims, wherein the first light color is darker than the second light color.
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6. A cooling device according to Claim 5, wherein the control unit drives the illumination unit so as to give out light with first light color when the outer environment is dark and so as to give out light with second light color when the outer environment is luminous.
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7. A cooling device according to any one of the preceding claims, wherein the sensor (131) is a photo transistor (T1) and accordingly, the second lamp (L2) is driven by said photo transistor (T1).
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8. A cooling device according to Claim 7, wherein said control unit comprises another transistor (T2) which drives said second lamp (L2) and which is driven by said photo transistor (T1).

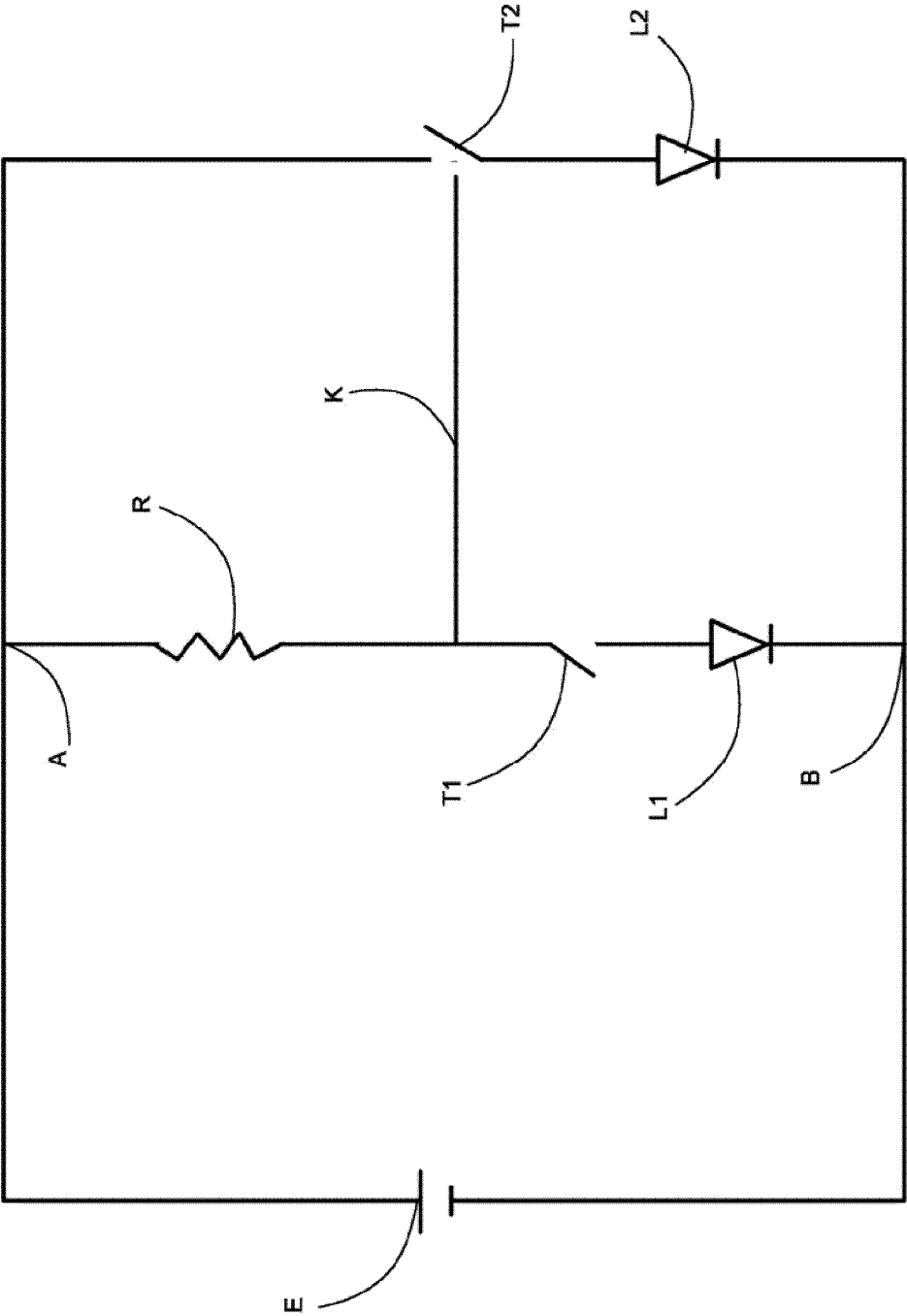
9. A cooling device according to any one of the preceding claims, wherein at least said sensor (131) is provided on the upper edge (16) of the front frame (15) of the cooling device facing outwardly.

1/2



Figur 1

2/2



Figur 2