REFRIGERATOR HAVING A VEGETABLE BOX

Inventor: Jung Suk Jung, Seoul (KR)

Assignee: DAEWOO ELECTRONICS Corporation, Seoul (KR)

Correspondence Address:
BACON & THOMAS, PLLC
625 SLATERS LANE, FOURTH FLOOR
ALEXANDRIA, VA 22314

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ABSTRACT

A refrigerator includes a main body having a door sensor that detects an opened state and a closed state of a door of the refrigerator; a vegetable box disposed in the main body to provide a space for receiving therein vegetables; and a control unit. The vegetable box includes a storing unit for storing therein the vegetables; and a photosynthesis promotion unit for emitting light required for photosynthesis of the vegetables to an inside of the storing unit. The control unit outputs a control signal for operating the photosynthesis promotion unit according to a detected result of the door sensor.
FIG. 1
(PRIOR ART)
FIG. 3
FIG. 6

FIG. 7

DOOR SENSOR -> CONTROL UNIT -> LIGHT EMITTING UNIT
FIG. 10

FIG. 11
FIG. 12
REFRIGERATOR HAVING A VEGETABLE BOX

FIELD OF THE INVENTION

[0001] The present invention relates to a refrigerator having a vegetable box capable of promoting photosynthesis of vegetables; and, more particularly, to a refrigerator with a vegetable box capable of promoting photosynthesis of vegetables by providing light required for photosynthesis of vegetables stored in the vegetable box, thereby maintaining the freshness of the vegetables stored therein.

BACKGROUND OF THE INVENTION

[0002] In general, the refrigerator includes a compressor, a condenser, an expansion device and an evaporator to perform a cooling cycle, and thus keeps the freshness of food items for a long period of time by cooled air generated through such a cooling cycle.

[0003] In such a refrigerator, a freezer compartment for preserving food items in a frozen state and a refrigerator compartment for preserving the food items in a refrigerated state are partitioned inside a main body forming external appearance thereof, so that the food items can be stored in either the refrigerator compartment or the freezer compartment according to the storage temperature of the food items.

[0004] FIG. 1 shows a configuration of a conventional refrigerator 10 whose refrigerator compartment is provided with a plurality of shelves 11 and a vegetable room 12 to separately store a large amount of food items such as vegetables or fruits therein.

[0005] Such a refrigerator keeps the vegetables stored therein at a low temperature by simply controlling the cooled air, whereby the freshness of the vegetables can be maintained for a certain period of time. However, in case of preserving them for a long time, the freshness of the vegetables may not be maintained.

[0006] The vegetables, which belong to the plant kingdom, respire and transpire even while they are stored in a refrigerator. Therefore, in order to maintain the freshness of the vegetables stored in the refrigerator, it is necessary to suppress the respiration and the transpiration.

[0007] Accordingly, the conventional refrigerator can maintain a certain degree of freshness by keeping the vegetables at a low temperature to suppress the respiration and in a high humidity to prevent the transpiration. However, since the chlorophyll contained in the vegetables cannot be prevented from being decomposed, the freshness of the vegetables cannot be maintained due to a decrease in the concentration of chlorophyll contained in the vegetables with the lapse of a certain period of time.

SUMMARY OF THE INVENTION

[0008] It is, therefore, an object of the present invention to provide a refrigerator having a vegetable box capable of promoting photosynthesis of vegetables stored therein to maintain the freshness of the vegetables by suppressing decomposition of chlorophyll contained in the vegetables.

[0009] It is another object of the present invention to provide a refrigerator having a vegetable box capable of evenly and efficiently providing vegetables stored therein with light required for photosynthesis.

[0010] It is still another object of the present invention to provide a refrigerator having a vegetable box that emits light for promoting photosynthesis of vegetables stored therein according to whether a door of the refrigerator is opened or closed.

[0011] In accordance with one aspect of the present invention, there is provided a refrigerator including a main body having a door sensor for detecting an opened state and a closed state of a door of the refrigerator; a vegetable box disposed in the main body to provide a space for receiving therein vegetables; and a control unit, wherein the vegetable box includes a storing unit for storing therein the vegetables; and a photosynthesis promoting unit for emitting light required for photosynthesis of the vegetables to an inside of the storing unit, and wherein the control unit outputs a control signal for operating the photosynthesis promotion unit according to a detected result of the door sensor.

[0012] In accordance with another aspect of the present invention, there is provided a vegetable box used for a refrigerator capable of promoting photosynthesis of vegetables, including a storing unit whose upper portion is opened to provide a space to receive therein the vegetables; and a photosynthesis promotion unit, installed on a top surface of a sidewall of the storing unit, for emitting light required for photosynthesis of the vegetables to an inside of the storing unit by using the storing unit as a medium for light propagation.

[0013] In accordance with still another aspect of the present invention, there is provided a vegetable box of a refrigerator capable of promoting photosynthesis of vegetables, including a storing unit whose upper portion is opened for providing a space to receive therein vegetables; a cover unit rotateably connected to the upper portion of the storing unit for opening and closing the upper portion of the storing unit; and a photosynthesis promotion unit, installed on a bottom surface of the cover unit, for emitting light required for photosynthesis of the vegetables to the storing unit.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] The above and other objects and features of the present invention will become apparent from the following description of embodiments given in conjunction with the accompanying drawings, in which:

[0015] FIG. 1 is a perspective view for showing a configuration of a conventional refrigerator;

[0016] FIG. 2 is a cross sectional view for showing a configuration of a refrigerator having a vegetable box in accordance with the present invention;

[0017] FIG. 3 is an exploded perspective view for illustrating a configuration of a vegetable box in accordance with a first embodiment of the present invention;

[0018] FIG. 4 is a side cross sectional view for showing the vegetable box in accordance with the first embodiment in an unassembled state;

[0019] FIG. 5 is a side cross sectional view for showing the vegetable box in accordance with a modified example of the first embodiment in an unassembled state;

[0020] FIG. 6 is a front cross sectional view for showing the vegetable box in accordance with the first embodiment of the present invention in an unassembled state;

[0021] FIG. 7 is a block diagram for illustrating a configuration to control the photosynthesis of the vegetables in accordance with the first embodiment;
[0022] FIG. 8 is a perspective view for showing light emitting units of the vegetable box in accordance with the modified example of the first embodiment;

[0023] FIG. 9 is an exploded perspective view for illustrating a configuration of a vegetable box in accordance with a second embodiment of the present invention;

[0024] FIG. 10 is a side cross sectional view for showing the vegetable box in accordance with the second embodiment in an assembled state;

[0025] FIG. 11 is a front cross sectional view for showing the vegetable box in accordance with the second embodiment in an assembled state;

[0026] FIG. 12 is a perspective view for illustrating a configuration of a vegetable box in accordance with a third embodiment of the present invention;

[0027] FIG. 13 is an exploded perspective view for illustrating a configuration of a photosynthesis promotion unit installed in the vegetable box in accordance with the third embodiment;

[0028] FIG. 14 is a side cross sectional view for showing the vegetable box in accordance with the third embodiment in an assembled state; and

[0029] FIG. 15 is a side cross sectional view for showing a vegetable box in accordance with a modified example of the third embodiment in an assembled state.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0030] Hereinafter, embodiments of the present invention will be described in detail with reference to the accompanying drawings so that they can be readily implemented by those skilled in the art.

First Embodiment

[0031] FIG. 2 shows a configuration of a refrigerator having a vegetable box in accordance with the present invention; and, FIGS. 3 to 7 depict a vegetable box in accordance with a first embodiment of the present invention.

[0032] As shown in FIG. 2, the refrigerator of the present invention includes a vegetable box 100, installed at an inner lower part of a main body 200, to provide a space for storing therein vegetables, fruits, or the like; and the vegetable box 100 is provided with a wiring (not shown) for supplying therefor an electric power required for emitting light that serves to promote photosynthesis of vegetables. In addition, the vegetable box 100 further includes a control unit 220 (shown in FIG. 7) for outputting a signal to control the light emission of the vegetable box 100 according to an output signal of a door sensor 211 which detects whether opening/closing of a refrigerator door 210 is opened.

[0033] Further, as shown in FIGS. 3 and 4, the vegetable box 100 includes a photosynthesis promotion unit 110 for emitting light required for photosynthesis onto the vegetables; a lens unit 120 for dispersing the light emitted from the photosynthesis promotion unit 110; storing unit 130, having a shape of a rectangular parallelepiped, whose upper portion is opened to receive the vegetables; and a reflection unit 140 for reflecting the light from the photosynthesis promotion unit 110 toward an inside of the storing unit 130.

[0034] The photosynthesis promotion unit 110, powered by a power supply of the refrigerator 200 and controlled by a control signal of the control unit 220, is preferably configured with a print circuit board and light emitting units 111 for emitting light required for photosynthesis of vegetables. The light emitting units 111 are arranged in one or more lines on the print circuit board.

[0035] Here, light emitting devices such as light emitting diodes, chip LEDs, white fluorescent lamps, incandescent lamps and/or the like can be used as the light emitting units 111. Among these, the chip LED is the most preferable.

[0036] Further, it is preferable that the light emitting units 121 emit the light whose wavelength falls within a range from 450 to 700 nm. In this range of wavelength, biological or chemical processes that cause to deteriorate the freshness of vegetables can be suppressed.

[0037] To be specific, the decomposition of chlorophyll contained in leaves of vegetables is suppressed. Thus, the decrease in the chlorophyll concentration is also suppressed to keep vegetables green in color. Further, the decrease in the amount of vitamin C contained in vegetables is also suppressed. Thus, vegetables can be kept fresh for a longer period of time, while maintaining the nutrients therein to be intact.

[0038] Meanwhile, the photosynthesis promotion unit 110 is disposed on a bottom surface of an upper portion of the vegetable box 100, and preferably, light emitted from the light emitting units 111 is irradiated onto a top surface of a sidewall 131 of the storing unit 130. Thus, the light is emitted from the light emitting units 111 and then transferred to an inside of the storing unit 130 by transmitting through the storing unit 130 as a medium for light propagation.

[0039] The photosynthesis promotion unit 110 is formed to have the same thickness as that of the sidewall 131 of the storing unit 130 of a rectangular parallelepiped shape whose upper portion is opened. Further, the light emitting units 111, arranged in one or more lines on the photosynthesis promotion unit 110, are installed in a manner corresponding to top surface 131a of the sidewall of the storing unit 130.

[0040] FIG. 8 shows a modified example of a photosynthesis promotion unit 110a. Here, the photosynthesis promotion unit 110a, disposed on the bottom surface of the upper portion of the vegetable box 100, is configured with a rectangular print circuit board (not shown) on the bottom surface of the upper portion of the vegetable box 100 and light emitting units 111a arranged in a matrix form at specific intervals on the print circuit board. Further, the vegetable box 100 may be configured such that the light is irradiated via an opened top area of the storing unit 130.

[0041] Referring to FIGS. 4 to 6, the lens unit 120 is installed between the photosynthesis promotion unit 110 and the storing unit 130 to refract and disperse the light irradiated from the photosynthesis promotion unit 110, whereby the light emitted from the light emitting units 111 reaches the sidewall top surface 131a of the storing unit 130 in a sufficiently dispersed state.

[0042] Furthermore, in order to sufficiently disperse the light emitted from the light emitting units 111, a lens unit 120 is provided with one or more concave lenses 121 disposed at a location corresponding to the light emitting units 111.

[0043] In addition, the lens unit 120 may be disposed such that it is in contact with the photosynthesis promotion unit 110 disposed on the bottom surface of the upper portion of the vegetable box 100; and, the lens unit 120 may also be disposed on the sidewall top surface 131a of the storing unit 130.
The storing unit 130, which is disposed in the vegetable box 100, is of a rectangular parallelepiped shape whose upper portion is opened to store therein various kinds of vegetables, fruits or the like. Further, the storing unit 130 is made of transparent material such as acryl, reinforced plastic or the like, through which light is easily transmitted; and preferably, is made of an acrylic material.

By configuring the vegetable box 100 such that the light emitted from the light emitting units 111 is transferred to the storing unit 130 through the upper surface of the storing unit 130, the light can be transferred to an entire surface of the storing unit 130 by transmitting the transparent material of the storing unit 130 as a medium for light propagation. Thus, light required for photosynthesis can be evenly supplied to vegetables stored in the storing unit 130.

If light required for photosynthesis of vegetables is transferred to vegetables only through air as a medium for light propagation, the light is likely not to be transferred to the vegetables located far from the light source or hidden by other vegetables. In accordance with the present embodiment, this problem can be overcome by using the storing box 130 as a medium for light propagation.

Furthermore, as shown in FIGS. 4 to 6, the reflection unit 140 is disposed on an outer surface of the storing unit 130 to reflect the light, transmitted through the storing unit 130 as a medium for light propagation, toward an inside of the storing unit 130.

With this structure, the reflection unit 140 prevents the light emitted from the light emitting units 111 from being spread outside the storing unit 130, and therefore, more light can be transferred to an inside of the storing unit 130.

To this end, it is preferable that the reflection unit 140 includes one or more convex mirrors, so that more light can be refracted toward the inside of the storing unit 130.

The door sensor 211, which is installed between the refrigerator 200 and the door 210 as shown FIG. 2, detects an opened state and a closed state of the door 210 and sends a door open signal and door close signal, respectively, to the control unit 220. As the door sensor 211, a conventional door sensor may be used.

If the control unit 220 receives the door open signal from the door sensor 211, it outputs a control signal, for stopping the operation of the photosynthesis promotion unit 110, to the photosynthesis promotion unit 110 to stop the operation thereof. However, if the control unit 220 receives the door close signal from the door sensor 211, it outputs a control signal, for maintaining or resuming the operation of the photosynthesis promotion unit 110, to the photosynthesis promotion unit 110 to allow the light to be emitted therefrom.

In the first embodiment of the present invention, the photosynthesis promotion unit 110 has been described to be disposed on the bottom surface of the upper portion of the vegetable box 100 of the refrigerator. However, it is also possible to install the photosynthesis promotion unit 110 on a top surface of the lower portion of the vegetable box 100 such that the light emitted upward from the lower portion of the vegetable box 100 comes into the sidewall bottom surface of the storing unit 130 to be transferred to an inside of the storing unit 130.

In this case, the reflection unit 140 provided on an outer surface of the storing unit 130 is installed throughout every outer surface of the storing unit 140 except for a bottom surface thereof.

In this manner, vegetables stored in the vegetable box 100 can be kept fresh.

Second Embodiment

FIGS. 9 to 11 show a vegetable box 300 used for a refrigerator capable of promoting photosynthesis of vegetables in accordance with the second embodiment of the present invention, and the second embodiment will be explained with reference to the accompanying drawings.

As shown in FIG. 9, the vegetable box 300 includes a photosynthesis promotion unit 320 for emitting light required for photosynthesis onto vegetables stored in the vegetable box 300; and a storing unit 330 of rectangular parallelepiped shape for storing therein the vegetables.

Further, the photosynthesis promotion unit 320 includes a print circuit board (not shown) having a shape that fits an upper surface of the peripheral portion of the storing unit 330: light emitting units 321 arranged in one or more lines on the print circuit board for emitting light required for photosynthesis of vegetables; and a connection part 322 for electrically coupling an external device thereto in order to supply an electric power for the operation of the light emitting units 321.

Here, light emitting devices such as light emitting diodes, chip LEDs, white fluorescent lamps, incandescent lamps and/or the like can be used as the light emitting units 321. Among these, the chip LED is the most preferable.

The reason why chip LEDs are preferable as the light emitting unit 321 is that the manufacturing time and cost can be efficiently saved by employing surface mount technology, and the photosynthesis promotion unit 320 can be reduced in size.

Further, it is preferable that the light emitting units 321 emit the light whose wavelength falls within a range from 450 to 700 nm. In this range of wavelength, biological or chemical processes that cause to deteriorate the freshness of vegetables can be suppressed.

To be specific, the decomposition of chlorophyll contained in leaves of vegetables is suppressed. Thus, the decrease in the chlorophyll concentration is also suppressed to keep vegetables green in color. Further, the decrease in the amount of vitamin C contained in vegetables is also suppressed. Thus, vegetables can be kept fresh for a longer period of time, while maintaining the nutrients therein to be intact.

Meanwhile, since the photosynthesis promotion unit 320 is installed on the upper peripheral portion of the storing unit 330, the light emitted from the light emitting units 321, arranged in one or more line on the photosynthesis promotion unit 320, is irradiated onto the upper surface of the storing unit 330.

At this time, the light emitted from the light emitting units 321 is transferred to an entire surface of storing unit 330 by transmitting the storing unit 330 as a medium for light propagation, so the light is irradiated through the inner and the outer surface of the storing unit 330.

The connection part 322 is installed at one side of the photosynthesis promotion unit 320 to be electrically coupled to the refrigerator or an external power supply. Thus, the electric power required for the operation of the photosynthesis promotion unit 320 is supplied from the refrigerator or the external power supply. Preferably, the connection part 322 is a connector.
The storing unit 330 is of a rectangular parallelepiped shape whose upper portion is opened to store various kinds of vegetables, fruits or the like. Further, the storing unit 330 is made of transparent material such as acryl, reinforced plastic or the like, through which light is easily transmitted; and preferably, is made of an acrylic material. Insertion grooves 331 are formed at the upper surface of the storing unit 330, so that the light emitting units 321 are attached thereto. With this structure, the light emitted from the light emitting units 321 is transmitted through the storing unit 330.

By configuring the vegetable box 300 such that the light emitted from the light emitting units 321 is transferred to the storing unit 330 through the upper surface of the peripheral portion of the storing unit 330, the light can be transferred to an entire surface of the storing unit 330 by transmitting the transparent material of the storing unit 330 as a medium for light propagation. Thus, light required for photosynthesis can be evenly supplied to vegetables stored in the storing unit 330.

If light required for photosynthesis of vegetables transferred to vegetables only by transmitting through air as a medium for light propagation, the light is likely not to be transferred to the vegetables located far from the light source or hidden by other vegetables. In accordance with the present embodiment, this problem can be overcome by using the storing box 330 as a medium for light propagation.

Furthermore, the reflection unit 340 is disposed on an outer surface of the storing unit 330 to reflect the light, transmitted through the storing unit 330 as a medium, to the inside of the storing unit 330.

With this structure, the reflection unit 340 prevents the light emitted from the light emitting units 321 from being transferred outside the storing unit 330, and therefore, more light can be irradiated inside the storing unit 330.

To this end, it is preferable that the reflection unit 340 includes one or more convex mirrors, so that a large quantity of light can be refracted toward the inside of the storing unit 330.

Further, a protection cover 310 is provided on top of the photosynthesis promotion unit 320 to couple the storing unit 330 more tightly to the photosynthesis promotion unit 320 and prevent the photosynthesis promotion unit 320 from being exposed to the outside.

Third Embodiment

FIGS. 12 to 15 show a vegetable box 500 used for a refrigerator capable of promoting photosynthesis of vegetables in accordance with the third embodiment of the present invention; and the third embodiment will be explained with reference to the accompanying drawings.

As shown in FIG. 12, the vegetable box 500 includes a cover unit 510, for opening and closing the upper portion of the vegetable box 500, having a light emitting device that emits light; a storing unit 520 of a rectangular parallelepiped shape for storing therein vegetables; and a rotation axis 530 for rotatably connecting the cover unit 510 with the storing unit 520; and a reflection unit 540 for reflecting the light, emitted from the light emitting device of the cover unit 510, to an inside of the storing unit 510. The reflection unit 540 is disposed on an outer surface of the storing unit 520.

With this structure, the reflection unit 540 prevents the light emitted from the light emitting device from being spread outside the storing unit 520, whereby more light can be transferred to an inside the storing unit 520.

To this end, it is preferable that the reflection unit 540 includes a convex mirror, so that a large quantity of light can be refracted toward the inside of the storing unit 520.

As shown in FIGS. 13 and 14, the cover unit 510 includes a cover frame 511 for covering the upper portion of the storing unit 520; a photosynthesis promotion unit 512 provided with a light emitting units 513 for emitting light onto vegetables stored in the storing unit 520; a light emitting unit protection cover 514 formed of a transparent material for protecting the photosynthesis promotion unit 512 and the light emitting units 513; and a connection part 550 for electrically coupling an external device thereto to supply an electric power for the operation of the light emitting units 513.

A groove portion is formed on a bottom surface of the cover frame 511 to accommodate therein the photosynthesis promotion unit 512; and one end portion of the cover frame 511 is rotatably connected to the storing unit 520 by means of the rotation axis 530.

Here, light emitting devices such as light emitting diodes, chip LEDs, white fluorescent lamps, incandescent lamps and/or the like can be used as the light emitting units 513. Among these, the chip LED is the most preferable.

Further, it is preferable that the light emitting units 513 emit the light whose wavelength falls within a range from 450 to 700 nm. In this range of wavelength, biological or chemical processes that cause to deteriorate the freshness of vegetables can be suppressed.

Further, it is preferable that the light emitting units 513 emit light having a wavelength ranging from 450 to 700 nm.

The light emitting unit protection cover 514 is formed of a transparent material in a shape that fits the print circuit board of the photosynthesis promotion unit 512. Further, as shown in FIG. 13, receiving groove portions 515 are formed at one side of the light emitting unit protection cover 514 to accommodating therein the light emitting units 513, so that the light emitted from the light emitting units 513 is transmitted therethrough.

Instead of the light emitting unit protection cover 514, as shown in FIG. 15, a lens unit 516 may be installed at a front side of the light emitting units 513 to refract and the light emitted from the light emitting units 513.

Since the light emitted from light emitting units 513 propagates in a forward direction with respect to the light source, most of the light is transferred to vegetables located to confront the light emitting units 513. Therefore, vegetables at other locations in the storing unit 520 are not likely to be supplied with a sufficient amount of light.

To avoid such a drawback, concave lenses 517 are formed at the lens unit 516 correspondingly to the light emitting units 513 such that the light emitted from the light emitting units 513 is refracted to be transferred sufficiently to an entire locations of the inside of the storing unit 520, especially to such locations that do not confront the light emitting units 513.

The connection part 550, installed at one side of the photosynthesis promotion unit 512, is electrically connected to the refrigerator or an external power supply, so that an electric power for the operation of the photosynthesis pro-
motion unit 512 can be provided from the refrigerator or the external device; and preferably, the connection part 550 is a connector.

[0087] With this structure, the light emitted from the light emitting units 513, installed at the photosynthesis promotion unit 512 in the cover unit 510, is transferred into the storing unit 520 via the emission unit protection cover 514.

[0088] Further, as described above, the lens unit 516 having the concave lenses 517 may be installed in place of the emission unit protection cover 514. In this case, the light emitted from the light emitting units 513 can be more widely dispersed and transferred into the inside of the storing unit 520.

[0089] The storing unit 520 is of a rectangular parallelepiped shape whose upper portion is opened to store therein various kinds of vegetables, fruits or the like. Further, the storing unit 520 is made of transparent material such as acrylic, reinforced plastic or the like, through which light is easily transmitted; and preferably, is made of an acrylic material.

[0090] Further, the reflection unit 540 is provided on an outer surface of the storing unit 520 to reflect the light, emitted from the upper part of the storing unit 520, to the inside of the storing unit 520.

[0091] The reflection unit 540 prevents the light emitted from the light emitting units 513 from being spread outside the storing unit 520, whereby more light can be transferred into the storing unit 520.

[0092] To this end, it is preferable that the reflection unit 540 includes one or more convex mirrors, so that more light can be refracted toward the inside of the storing unit 130.

[0093] Although the embodiments have been described with respect to a vegetable box used for a refrigerator, the vegetable box can also be used to promote photosynthesis of vegetables stored therein independently of the refrigerator, as long as a sufficient electric power is supplied to the light emitting units 513 via, e.g., the connection part 550.

[0094] As described above, in accordance with the present invention, the light required for photosynthesis of the vegetables stored in the vegetable box of the refrigerator can be supplied sufficiently. Therefore, decomposition of chlorophyll contained in the vegetables is suppressed, so that the vegetables can be kept fresh in the vegetable box.

[0095] While the invention has been shown and described with respect to the embodiments, it will be understood by those skilled in the art that various changes and modifications may be made without departing from the scope of the invention as defined in the following claims.

What is claimed is:

1. A refrigerator comprising:
   a main body having a door sensor that detects an opened state and a closed state of a door of the refrigerator;
   a vegetable box disposed in the main body to provide a space for receiving therein vegetables; and
   a control unit,
   wherein the vegetable box includes a storing unit for storing therein the vegetables, and a photosynthesis promotion unit for emitting light required for photosynthesis of the vegetables to an inside of the storing unit, and
   wherein the control unit outputs a control signal for operating the photosynthesis promotion unit according to a detected result of the door sensor.

2. The refrigerator of claim 1, wherein the vegetable box further includes a lens unit disposed between the storing unit and the photosynthesis promotion unit to disperse the light emitted from the photosynthesis promotion unit.

3. The refrigerator of claim 2, wherein the lens unit has one or more concave lenses.

4. The refrigerator of claim 2, wherein the vegetable box further includes a reflection unit provided on an outer surface of the storing unit that reflects the light emitted from the photosynthesis promotion unit to the inside of the storing unit.

5. The refrigerator of claim 4, wherein the reflection unit has one or more convex mirrors.

6. The refrigerator of claim 1, wherein the photosynthesis promotion unit includes one or more light emitting units capable of emitting the light required for the photosynthesis of the vegetables, and
   wherein each of the light emitting units has a emitting diode.

7. The refrigerator of claim 1, wherein the photosynthesis promotion unit includes one or more light emitting units capable of emitting the light required for the photosynthesis of the vegetables, and
   wherein each of the light emitting units has a chip LED.

8. The refrigerator of claim 1, wherein the photosynthesis promotion unit emits the light whose wavelength is within a range from 450 to 700 nm.

9. The refrigerator of claim 1, wherein the light emitted from the photosynthesis promotion unit propagates toward a top surface of a sidewall of the storing unit, and transferred to the inside of the storing unit by transmitting through the storing unit as a medium of light propagation.

10. The refrigerator of claim 1, wherein the vegetable box further includes a connection part to be connected to a power supply that supplies an electric power for the photosynthesis promotion unit, and
   wherein an upper portion of the storing unit is opened, and
   the photosynthesis promotion unit is installed on a top surface of a sidewall of the storing unit to emit the light by using the storing unit as a medium for light propagation.

11. The refrigerator of claim 1, wherein the vegetable box further includes:
   a cover unit rotatably connected to an upper portion of the storing unit for opening and closing the upper portion of the storing unit; and
   a connection part to be connected to a power supply that supplies an electric power for the photosynthesis promotion unit, and
   wherein an upper portion of the storing unit is opened, and
   the photosynthesis promotion unit is installed on a bottom surface of the cover unit to emit the light by using the storing unit as a medium for light propagation.

12. The refrigerator of claim 11, wherein the vegetable box further includes a lens unit disposed on a front surface of the photosynthesis promotion unit for reflecting the light emitted from the photosynthesis promotion unit toward the inside of the storing unit.

13. The refrigerator of claim 12, wherein the lens unit has one or more concave lenses.

14. The refrigerator of claim 12, wherein the vegetable box further includes a reflection unit provided on an outer surface of the storing unit that reflects the light emitted from the photosynthesis promotion unit to the inside of the storing unit.

surface of the storing unit to reflect the light emitted from the photosynthesis promotion unit to the inside of the storing unit.

15. The refrigerator of claim 14, wherein the reflection unit has one or more convex mirrors.

16. The refrigerator of claim 10, wherein the photosynthesis promotion unit has
   a print circuit board; and
   light emitting units formed on the print circuit board for emitting the light required for photosynthesis of vegetables.

17. The refrigerator of claim 16, wherein the light emitting units emit the light by using one or more selected from the group consisting of a light emitting diode, a chip LED, a white fluorescent lamp and an incandescent lamp.

18. The refrigerator of claim 17, wherein the light emitting units emit the light whose wavelength is within a range from 450 to 700 nm.

19. A vegetable box used for a refrigerator capable of promoting photosynthesis of vegetables, comprising:
   a storing unit whose upper portion is opened to provide a space to receive therein the vegetables; and
   a photosynthesis promotion unit, installed on a top surface of a sidewall of the storing unit, for emitting light required for photosynthesis of the vegetables to an inside of the storing unit by using the storing unit as a medium for light propagation.

20. A vegetable box of a refrigerator capable of promoting photosynthesis of vegetables, comprising:
   a storing unit whose upper portion is opened for providing a space to receive therein vegetables;
   a cover unit rotatably connected to the upper portion of the storing unit for opening and closing the upper portion of the storing unit; and
   a photosynthesis promotion unit, installed on a bottom surface of the cover unit, for emitting light required for photosynthesis of the vegetables to the storing unit.

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