Abstract: The present invention relates to a dual radiation traffic sign apparatus, and in particular to a dual radiation traffic sign apparatus in which a self-reflection sheet forms a specific traffic message, and when the light from a vehicle is emitted to a self-reflection sheet, it is reflected by means of a self-reflection sheet, so such a specific traffic sign indirectly emits a plurality of through holes formed in a self-reflection sheet, so such light is emitted through the through holes by means of a lighting unit installed in its interior. When the light from the vehicle is directly emitted to a self-reflection sheet, the light from the lighting unit can be directly emitted through the through holes formed in the self-reflection sheet. Nevertheless a lamp light of a vehicle is directly emitted to a traffic sign apparatus or not, a driver can doubly recognize a traffic sign.
Description

DUAL RADIATION TRAFFIC SIGN

Technical Field

[1] The present invention relates to a dual radiation traffic sign apparatus, and in particular to a dual radiation traffic sign apparatus in which a self-reflection sheet forms a specific traffic message, and when the light from a vehicle is emitted to a self-reflection sheet, it is reflected by means of a self-reflection sheet, so a specific traffic sign indirectly emits. A plurality of through holes are formed in a self-reflection sheet, so light is emitted through the through holes by means of a lighting unit installed in its interior. When the light from the vehicle is directly emitted to a self-reflection sheet, the light from the lighting unit can be directly emitted through the through holes formed in the self-reflection sheet. Nevertheless a lamp light of a vehicle is directly emitted to a traffic sign apparatus or not, a driver can doubly recognize a traffic sign.

Background Art

[2] Generally, a milestone or a road guide sign plate is installed in a certain section of a road or in a cross. The road guide sign plate is installed as an elbow support member is installed in a roadside, and a metallic plate with a road guide character or symbol is hanged. At this time, a road guide character of the road guide sign plate is made by attaching a high luminance reflection sheet.

[3] So, when a light of a vehicle is reflected by the road sign plate, the high luminance reflection sheet reflects and scatters the light from the vehicle, so a driver can easily recognize the contents of the road guide.

[4] However, in a conventional reflection type road sign plate, when the light from a vehicle lamp is not directly emitted to the road sign plate or a dew formation occurs on the reflection sheet due to dew or moisture, the foreign substances such as dusts are mixed with the water drops formed of the reflection sheet for thereby polluting the reflection sheet, so reflection performance is decreased. When the emitting direction of the light from the vehicle lamp is not matched with the facing direction of the road sign plate due to the curved portions of the road in which the road sign plate is installed, a driver cannot easily read the contents of the road guide sign plate, which leads to incorrect understanding. In the conventional art, the guide character is not automatically reflected, but it is reflected as receiving a light from the vehicle lamp, so the driver can read the contents of the road sign plate.

[5] So as to overcome the above problems, a self-reflection road sign plate is under development instead of the road sign plate which can be recognized only by a lighting of the vehicle. However, in case of the self-reflection road sign plate, since the road sign
plate is installed outdoor, so it needs to equip with waterproof performance along with a molding process, which leads to increasing manufacture cost, and since the thickness of the sign plate increases with the help of the lighting unit, an outer appearance of the road might look bad.

[6] The inventor of the present invention has invented a specific traffic sign by using a self-reflection sheet. A plurality of through holes are formed in a frame with the above sheet thereon. The light is emitted by means of the lighting unit engaged in the interior, so a visibility and recognition performance of the traffic sign can be significantly enhanced from a remote area or a near area nevertheless the vehicle light is directly emitted to the traffic sign or not. A waterproof frame structure is provided, in which rain water or something cannot be inputted into the lighting unit by improving the structure of the frame.

Disclosure of Invention

Technical Problem

[7] Accordingly, it is an object of the present invention to provide a dual radiation traffic sign apparatus in which when a vehicle runs, and a vehicle lamp emits light on a self-reflection sheet of a traffic sign plate, the emitted light is reflected and scattered, so the traffic sign can be recognized. When the light from the vehicle lamp is not directly emitted to the reflection sheet due to the curved portions of the road when the vehicle runs along the curved portions, the light is emitted to the traffic sign through the through holes, so it can be reliably recognized.

[8] It is another object of the present invention to provide a dual radiation traffic sign apparatus in which a channel shaped stepped part, which forms a concave groove in its interior, is formed along a rim of a frame, so the rain water inputted from the outside is discharged along the concave groove formed in the stepped part for thereby implementing a perfect waterproof effect by improving the structure of the frame.

[9] It is further another object of the present invention to provide a dual radiation traffic sign apparatus in which an accommodation frame is provided in the interior of the frame for accommodating the lighting unit. So, the lighting unit can be reliably waterproofed even with respect to the water which might be inputted into the frame.

Technical Solution

[10] To achieve the above objects, there is provided a dual radiation traffic sign apparatus which comprises a front frame which has a cut-away part for forming a specific traffic sign; a rear frame which is engaged with the front frame and forms an accommodation space in its interior; a self-reflection sheet which is arranged on a backside of the front frame and is attached as corresponding to the cut-away part and is equipped with a plurality of through holes; a transparent panel which is attached as corresponding to a
backside of the self-reflection sheet and prevents rainwater or pollutants from being inputted through the through holes; and a lighting means which is installed in an inner surface of the rear frame and emits light toward the cut-away part of the front frame, whereby when the light from a vehicle lamp is emitted to the self-reflection sheet, the light is reflected by means of the self-reflection sheet, and a specific traffic sign is emitted, and when the light from the vehicle lamp is not directly emitted to the self-reflection sheet, the light from the lighting means is directly emitted through the through holes formed in the self-reflection sheet, so a specific traffic sign formed of the cut-away part can be doubly seen.

Advantageous Effects

It should be appreciated that the present invention has the following advantages.

First, a conventional reflection type and a self-reflection type are combined. When a vehicle runs, and the light of the vehicle lamp is directly emitted to a self-reflection sheet of the traffic sign plate, the self-reflection sheet reflects and scatters the emitted light. When the vehicle runs along the curved portions of the road, and the light of the vehicle lamp is not directly emitted to the reflection sheet, the light can be emitted through the through holes, so the traffic sign can be reliably read.

Second, a perfect waterproof structure is implemented by structurally improving a frame. So, any waterproof work is not needed in the present invention, which leads to significantly decreasing manufacture cost, and the thickness of the sign plate is thin, so a slim traffic sign apparatus can be manufactured.

Third, an accommodation frame is provided in the interior of the frame for accommodating the lighting unit, so it is possible to prevent the lighting unit from being exposed to rainwater with the help of the double waterproof structure along with a waterproof structure in the frame.

Brief Description of the Drawings

Figure 1 is a disassembled perspective view illustrating a dual radiation traffic sign apparatus according to an embodiment of the present invention.

Figure 2 is an engaged cross sectional view illustrating a dual radiation traffic sign apparatus according to an embodiment of the present invention.

Figure 3 is a reference perspective view illustrating a waterproof structure of a frame in a dual radiation traffic sign apparatus according to an embodiment of the present invention.

Figure 4 is a disassembled perspective view illustrating a dual radiation traffic sign apparatus according to another embodiment of the present invention.

Best Mode for Carrying Out the Invention

According to the present invention, a dual radiation traffic sign apparatus comprises a
front frame which has a cut-away part for forming a specific traffic sign; a rear frame which is engaged with the front frame and forms an accommodation space in its interior; a self-reflection sheet which is arranged on a backside of the front frame and is attached as corresponding to the cut-away part and is equipped with a plurality of through holes; a transparent panel which is attached as corresponding to a backside of the self-reflection sheet and prevents rainwater or pollutants from being inputted through the through holes; and a lighting means which is installed in an inner surface of the rear frame and emits light toward the cut-away part of the front frame, whereby when the light from a vehicle lamp is emitted to the self-reflection sheet, the light is reflected by means of the self-reflection sheet, and a specific traffic sign is emitted, and when the light from the vehicle lamp is not directly emitted to the self-reflection sheet, the light from the lighting means is directly emitted through the through holes formed in the self-reflection sheet, so a specific traffic sign formed of the cut-away part can be doubly seen.

According to another embodiment of the invention, a dual radiation traffic sign apparatus comprises a front frame which is formed as a self-reflection part forms a specific traffic sign and is equipped with a plurality of through holes formed in the self-reflection part; a rear frame which is engaged with the front frame and forms an accommodation space in its interior; a transparent panel which is attached as corresponding to a backside of the self-reflection part of the front frame and prevents rainwater or pollutants from being inputted through the through holes; and a lighting means which is installed in an inner side of the rear frame and emits light toward the cut-away part of the front frame, whereby when the light from a vehicle lamp is emitted to the self-reflection sheet, the light is reflected by means of the self-reflection part, so a specific traffic sign is indirectly emitted, and when the light from a vehicle lamp is not directly emitted to the self-reflection part, the light from the lighting means is directly emitted through the through holes formed in the self-reflection part, so a specific traffic sign formed of a self-reflection part can be doubly recognized.

Mode for the Invention

The preferred embodiments of the present invention will described in details with reference to the accompanying drawings.

Figure 1 is a disassembled perspective view illustrating a dual radiation traffic sign apparatus according to an embodiment of the present invention.

As shown in Figure 1, the dual radiation traffic sign apparatus according to an embodiment of the present invention comprises a front frame 10a for forming a cut-away part 12 for a specific traffic sign (for example, arrows), a rear frame 10b which is engaged with the front frame 10a and forms an accommodation space in its interior, a
self-reflection sheet 20 which is arranged on a back side of the front frame 10a and is attached as corresponding to the cut-away part 12 and is equipped with a plurality of through holes 22, a transparent panel 30 which is attached to a backside of the self-reflection sheet 20 for thereby preventing rainwater or pollutants from being inputted through the through holes 22, and a lighting unit 40 which is installed in an inner side of the rear frame 10b and emits light toward the cut-away part 12 of the front frame 10a.

[24] The front frame 10a forms a cut-away part 12 formed of various patterns by cutting its center portion such as arrows, t-turn sign, direction sign, etc. Preferably, a self-reflection sheet having a color different from that of the self-reflection sheet 20 disposed as corresponding to the cut-away part 12 might further provided in the non-cut portion in the front frame 10a. It might be painted with a paint having a self-reflection characteristic. In the drawings of the present invention, a circular shaped traffic sign plate is exampled, but it is obvious that those who skilled in the art might adapt various shapes such as a triangle shape, a rectangular shape or something.

[25] The rear frame 10b is engaged with the front frame 10a for thereby forming an accommodation space in the interior. They can be reliably engaged by using a bolt or something.

[26] The self-reflection sheet 20 is disposed on a backside of the front frame 10a and is attached as corresponding to the cut-away part 12. In this case, a plurality of through holes 22 are formed in the self-reflection sheet 20. The self-reflection sheet 20 disposed on a backside of the front frame 10a is exposed to the outside in the same shape as the cut-away part 12 formed in a shape of a specific traffic sign. So, when the light from the vehicle lamp is emitted to the self-reflection sheet 20 of the dual radiation traffic sign plate, it is reflected by means of the self-reflection sheet 20 for thereby allowing a specific traffic sign to emit lights. The lighting unit 40 is installed in the inner side of the rear frame 10b. The light emitted by means of the lighting unit 40 is emitted toward the cut-away part 12 of the front frame 10a. Consequently, when the light from the vehicle lamp is not emitted to the self-reflection sheet 20, the light from the lighting unit 40 is directly emitted through the through holes 22 formed in the self-reflection sheet 20, so that a specific traffic sign formed of the cut-away parts can be seen doubly.

[27] A plurality of the through holes are formed in the self-reflection sheet 20 of the traffic sign, so a visibility and recognition performance of the traffic sign can be enhanced in a remote area or a near area nevertheless that the light of the vehicle lamp is directly emitted to the traffic sign plate or not.

[28] The transparent panel 30 is attached to a backside of the self-reflection sheet 20 for thereby preventing water or pollutants from being inputted from the through holes. The
light emitted from the backside of the transparent panel 30 passes through the transparent panel 30, and part of the same is scattered while surface-emitting, so that the whole surfaces of the traffic sign can be uniformly light-emitted.

[29] As shown in Figure 1, the lighting unit 40 is constituted as a plurality of LEDs 44 are arranged on the PCB substrate 42. Preferably, a LED module formed of a PCB substrate and LEDs are made in a module type, and the module type lighting unit might be installed in an inner surface of the rear frame in multiple rows. For example, the module type lighting units formed in a rectangular shape or a square shape might be installed in the traffic sign as being opposite to each other. So, it is not needed to manufacture the PCB substrate corresponding to the shapes of various traffic signs to be indicated. The module type lighting units might be arranged in the rear frame as corresponding to various shapes of traffic signs, which leads to simple manufacture process and low manufacture cost.

[30] The lighting unit 40 is installed in an inner side of the rear frame, and preferably, the lighting unit 40 is protruded from an inner surface of the rear frame and is inserted into the interior of the accommodation frame 14 having an accommodation frame. Consequently, even when rainwater or something is inputted into the interior of the frame, the light unit 40 surrounded by means of the accommodation frame 14 can be reliably protected from rainwater or something.

[31] More preferably, a support member 50 is further provided between the transparent panel 30 and the lighting unit 40 in the interior of the accommodation frame at a certain interval while supporting the lighting unit 40. The support member 50 keeps a certain interval between the lighting unit 40 and the transparent panel 30. So, the light from the lighting unit 40 is emitted to the wider area of the transparent panel 30. Consequently, the light passes through the transparent panel 30 along with more efficient surface light emission.

[32] Figure 2 is an engaged cross sectional view illustrating a dual radiation traffic sign apparatus according to an embodiment of the present invention. Figure 3 is a reference perspective view illustrating a waterproof structure of a frame in a dual radiation traffic sign apparatus according to an embodiment of the present invention.

[33] As shown in Figures 2 and 3, a stepped part 14 having a channel shaped cross section is formed along a rim of the front frame 10a. The stepped part 14 is equipped with a concave groove 16 for thereby discharging rainwater or something to the outside along the concave groove 16 of the stepped part 14. Consequently, even when part of rainwater is inputted through the front and rear frames, the inputted rainwater might be discharged to the lower side along the concave groove 16 while being supported by the stepped part 14.

[34] Figure 4 is a disassembled perspective view illustrating a dual radiation traffic sign
apparatus according to another embodiment of the present invention.

As shown in Figure 4, the dual radiation traffic sign apparatus according to another embodiment of the present invention is constituted as a self-reflection part 122 forms a specific traffic sign and includes a front frame 110a in which a plurality of through holes 122 are formed in the self-reflection part 122, a rear frame 110b which is engaged with the front frame 110a and has an accommodation space, a transparent panel 130 which is attached as corresponding to a backside of the self-reflection part 122 of the front frame 110a for thereby preventing rainwater or pollutants from being inputted through the through holes, and a lighting unit 140 which is installed in an inner surface of the rear frame 110b and emits light toward the front frame. When the light from the vehicle lamp is emitted to the self-reflection sheet 122, the light is reflected by means of the self-reflection part 122, so a specific traffic sign is emitted, and when the light from the vehicle lamp is not directly emitted to the self-reflection part 122, the light from the lighting unit 140 is directly emitted through the through holes 122 formed in the self-reflection part 120, so a specific traffic sign formed of the self-reflection part 122 can be doubly recognized.

In the another embodiment of the present invention, a traffic sign is not formed by cutting away the front frame as compared to the earlier embodiment of the present invention, but a specific traffic sign is formed by using a self-reflection sheet on a front side of the front frame 110a, and a plurality of through holes 122 are formed only in the self-reflection part 122 having a specific traffic sign. In the above structure, a cutting process performed for forming a cut-away part is omitted, and it is not needed to form the holes in the self-reflection sheet. Namely, the self-reflection sheet is attached, and the holes are formed in the front frame, so the manufacturing process might be simplified, and a manufacturing cost can be decreased.

As the present invention may be embodied in several forms without departing from the spirit or essential characteristics thereof, it should also be understood that the above-described examples are not limited by any of the details of the foregoing description, unless otherwise specified, but rather should be construed broadly within its spirit and scope as defined in the appended claims, and therefore all changes and modifications that fall within the meets and bounds of the claims, or equivalences of such meets and bounds are therefore intended to be embraced by the appended claims.

Industrial Applicability

It should be appreciated that the present invention has the following advantages.

First, a conventional reflection type and a self-reflection type are combined. When a vehicle runs, and the light of the vehicle lamp is directly emitted to a self-reflection sheet of the traffic sign plate, the self-reflection sheet reflects and scatters the emitted
light. When the vehicle runs along the curved portions of the road, and the light of the vehicle lamp is not directly emitted to the reflection sheet, the light can be emitted through the through holes, so the traffic sign can be reliably read.

Second, a perfect waterproof structure is implemented by structurally improving a frame. So, any waterproof work is not needed in the present invention, which leads to significantly decreasing manufacture cost, and the thickness of the sign plate is thin, so a slim traffic sign apparatus can be manufactured.

Third, an accommodation frame is provided in the interior of the frame for accommodating the lighting unit, so it is possible to prevent the lighting unit from being exposed to rainwater with the help of the double waterproof structure along with a waterproof structure in the frame.
Claims

[1] A dual radiation traffic sign apparatus, comprising:
   a front frame which has a cut-away part for forming a specific traffic sign;
   a rear frame which is engaged with the front frame and forms an accommodation space in its interior;
   a self-reflection sheet which is arranged on a backside of the front frame and is attached as corresponding to the cut-away part and is equipped with a plurality of through holes;
   a transparent panel which is attached as corresponding to a backside of the self-reflection sheet and prevents rainwater or pollutants from being inputted through the through holes; and
   a lighting means which is installed in an inner surface of the rear frame and emits light toward the cut-away part of the front frame,
   whereby when the light from a vehicle lamp is emitted to the self-reflection sheet, the light is reflected by means of the self-reflection sheet, and a specific traffic sign is emitted, and when the light from the vehicle lamp is not directly emitted to the self-reflection sheet, the light from the lighting means is directly emitted through the through holes formed in the self-reflection sheet, so a specific traffic sign formed of the cut-away part can be doubly seen.

[2] A dual radiation traffic sign apparatus, comprising:
   a front frame which is formed as a self-reflection part forms a specific traffic sign and is equipped with a plurality of through holes formed in the self-reflection part;
   a rear frame which is engaged with the front frame and forms an accommodation space in its interior;
   a transparent panel which is attached as corresponding to a backside of the self-reflection part of the front frame and prevents rainwater or pollutants from being inputted through the through holes; and
   a lighting means which is installed in an inner side of the rear frame and emits light toward the cut-away part of the front frame,
   whereby when the light from a vehicle lamp is emitted to the self-reflection sheet, the light is reflected by means of the self-reflection part, so a specific traffic sign is indirectly emitted, and when the light from a vehicle lamp is not directly emitted to the self-reflection part, the light from the lighting means is directly emitted through the through holes formed in the self-reflection part, so a specific traffic sign formed of a self-reflection part can be doubly recognized.

[3] The apparatus of either claim 1 or claim 2, wherein a stepped part having a
channel shaped cross section is formed along a rim of the front frame, so water inputted from the outside is discharged along a concave groove of the interior of the stepped part.

[4] The apparatus of either claim 1 or claim 2, wherein said lighting means is constituted as a plurality of LEDs are continuously arranged on a PCB substrate.

[5] The apparatus of either claim 1 or claim 2, wherein said lighting means is a module type lighting means formed of a PCB substrate and LEDs, and said module type lighting means is arranged in multiple numbers as being opposite to a specific traffic sign.

[6] The apparatus of either claim 1 or claim 2, further comprising an accommodation frame having a concave groove in its interior as being protruded from an inner side of the rear frame, and said lighting means is inserted into the interior of the accommodation frame.

[7] The apparatus of either claim 1 or claim 2, wherein at least one support member is provided in the interior of the accommodation frame while supporting the lighting means for thereby maintaining a certain interval between the transparent panel and the lighting means.

[8] The apparatus of claim 1, wherein a self-reflection sheet having a color different from that of the self-reflection sheet arranged as corresponding to the cut-away part is provided in the region, which is not cut-away, in the front frame.

[9] The apparatus of claim 2, wherein a self-reflection sheet having a color different from that of the self-reflection sheet attached to the self-reflection part having the through holes is provided in the region, which does not have through holes, in the front frame.
# A. CLASSIFICATION OF SUBJECT MATTER

**EOIF 9/015(2006.01)**

According to International Patent Classification (IPC) or to both national classification and IPC

# B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 8 EOIF 9/015

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

- Korean utility models and applications for utility models since 1975
- Japanese utility models and applications for utility models since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKIPASS (internal) & keywords traffic sign, front frame, rear frame, self-reflection sheet, transparent panel, and lighting means

# C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Further documents are listed in the continuation of Box C

See patent family annex

* Special categories of cited documents
  * "A" document defining the general state of the art which is not considered to be of particular relevance
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Date of the actual completion of the international search

05 DECEMBER 2008 (05 12 2008)

Date of mailing of the international search report

05 DECEMBER 2008 (05.12.2008)

Name and mailing address of the ISA/KR

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