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(54) **Luminescent signboard.**

(57) A luminescent signboard includes a first light emitter and a second light emitter. The first light emitter is disposed on a base plate and has a configuration corresponding to a predetermined sign. The second light emitter is disposed on the base plate at a different position from the first light emitter. A sunset sensor is provided for detection of sunset. A proximity sensor is provided for detection of an object or a person which or who has come to a position within a predetermined distance from the signboard. A control unit is operable to connect a power source to the second light emitter so as to permit emission of light therefrom when the sunset sensor detects sunset. Further, the control unit is operable to connect the power source to the first light emitter so as to permit emission of light therefrom when the proximity sensor detects an object or a person during detection of sunset by the sunset sensor.

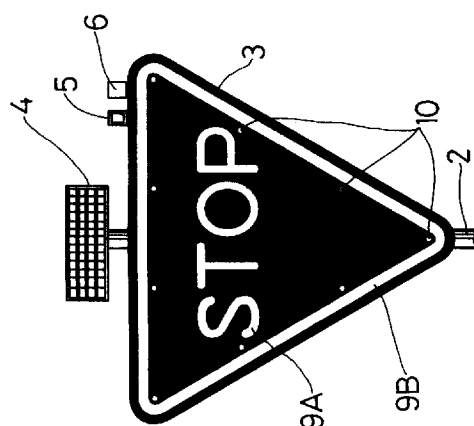


FIG. 1(A)

Background of the Invention

The present invention relates to a luminescent signboard such as a traffic signboard which is operable to emit light from a character portion or a frame portion surrounding the character portion so as to permit recognition of the character portion in the nighttime.

There has been proposed a luminescent traffic signboard which permits a bicycle rider, a motorcycle rider, an automobile driver, or a pedestrian to recognize the sign even after sunset.

A conventional luminescent traffic signboard includes a planar light emitter such as an electroluminescence emitter which is mounted on substantially the whole surface of the signboard and which is operable to emit light after sunset. A character portion including characters such as "STOP" and a frame portion surrounding the character portion are drawn on a transparent plate such as an acrylic plate superposed on the planar light emitter, so that they can be contrasted when the light emitter emits light.

With the conventional luminescent traffic signboard, although the planar light emitter emits light during sunset, its light emitting condition is unchanged, so that it is difficult for an automobile driver, a motorcycle rider, a bicycle rider, or a pedestrian to distinctly visually recognize the characters or sign.

It is, accordingly, an object of the present invention to provide a luminescent signboard having a luminescent display which can be distinctly visually recognized by a person such as an automobile driver, a motorcycle rider, a bicycle rider or a pedestrian.

According to the present invention, there is provided a luminescent signboard comprising;

a base plate;

a first light emitter disposed on the base plate and having a configuration corresponding to a predetermined sign;

a second light emitter disposed on the base plate at a different position from the first light emitter;

a sunset sensor operable to detect sunset;

a proximity sensor operable to detect an object or a person which or who has come to a position within a predetermined distance from the signboard;

a power source for supplying power to the first and second light emitters, the sunset sensor and the proximity sensor; and

a control unit operable to connect the power source to the second light emitter so as to permit emission of light therefrom when the sunset sensor detects sunset, the control unit being operable to connect the power source to the first light emitter so as to permit emission of light therefrom when the proximity sensor detects an object or a person during detection of sunset by the sunset sensor.

The invention will become more fully apparent from the claims and the description as it proceeds in

connection with the drawings. The embodiments shown in the drawings and described in detail are given by way of example only.

FIG. 1(A) is a front view of the whole signboard according to an embodiment of the present invention;

FIG. 1(B) is a side view of FIG. 1(A);

FIG. 2 is an exploded perspective view of a signboard panel of the signboard;

FIG. 3 is a block diagram of a control circuit of the signboard;

FIGS. 4(A) and 4(B) are view similar to FIGS. 1(A) and 1(B), respectively, but showing a modification of the embodiment;

FIGS. 5(A) and 5(B) are view similar to FIGS. 1(A) and 1(B), respectively, but showing another modification of the embodiment; and

FIGS. 6(A) and 6(B) are view similar to FIGS. 1(A) and 1(B), respectively, but showing a further modification of the embodiment.

Referring to the drawings and to FIGS. 1(A) and 1(B) in particular, there is shown a front view of a luminescent signboard 1 which is a traffic signboard for temporary stop. As shown therein, the signboard 1 includes a pole 2 fixed to the ground (not shown) and extending upwardly therefrom. A signboard panel 3 having an inverted triangular configuration is mounted on the upper end of the pole 2. A solar battery 4 chargeable by sunlight, a proximity sensor 5 and a sunset sensor 6 are mounted on the upper portion of the signboard panel 3. The proximity sensor 5 is sensitive to thermal changes and is operable to output an approach detection signal through detection of an automobile, a motorcycle, a bicycle or a pedestrian when it or he or she has come to a position within a predetermined distance from the signboard 1. The sunset sensor 6 is operable to output a sunset detection signal upon detection of sunset. A control unit 15 is mounted on the rear surface of the signboard panel 3.

As shown in FIG. 2, the signboard panel 3 includes a base plate 7 made of aluminum and fixed to the pole 2, a cushion sheet 8 made of resilient material and adhered to the front surface of the base plate 7, a first and a second planar light emitter 9A and 9B each comprising a long-life electroluminescence emitter and adhered to the surface of the cushion sheet 8. The first light emitter 9A has a configuration corresponding to characters "STOP", while the second light emitter 9B has a configuration corresponding to an inverted triangular frame line. A plurality of light emitting diodes 10 are disposed along the inner peripheral edge of the second planar light emitter 9B and are equally spaced from each other. The first and second light emitters 9A and 9B and the light emitting diodes 10 are covered by a transparent cover plate 11 made of acrylic resin. The signboard panel 3 further includes an opaline backing plate 12 made of polycar-

bonate and having an extra weather-resistance, a high-intensity reflection sheet 13 adhered to the backing plate 12 so as to cover the same by the whole area thereof excluding an area corresponding to the characters "STOP" and the inverted triangular frame line or the first and the second light emitters 9A and 9B. An outer peripheral trim 14 made of synthetic resin is fitted on the peripheral portion of an assembly including the base plate 7, the cushion sheet 8, the transparent cover plate 11 and the backing plate 12 on which the reflection sheet 13 is attached, so that these parts of the assembly are fixed together by the trim 14.

As shown in FIG. 3, the control unit 15 is connected to the solar battery 4 as a power source of the circuit, the proximity sensor 5, the sunset sensor 6 and the planar light emitters 9A and 9B (the long-life electroluminescences) corresponding to the characters "STOP" and the inverted triangular frame line, respectively, and the light emitting diodes 10.

The operation of the control unit 15 will now be explained. When the sunset sensor 6 outputs a sunset detecting signal upon detection of sunset, the control unit 15 energizes the light emitting diodes 10, so that flashing light is emitted from the light emitting diodes 10, permitting recognition in the nighttime of the presence of the signboard 1 by an automobile driver, a bicycle rider, a motorcycle rider, or a pedestrian who is located away from the signboard 1. When an automobile, a bicycle, a motorcycle or a pedestrian approaches the signboard 1 to reach the position for detection by the proximity sensor 5, the proximity sensor 5 outputs the detection signal which is inputted to the control unit 15. Then, the control unit 15 energizes the planar light emitters 9A and 9B (the long-life electroluminescences) corresponding to the characters "STOP" and the inverted triangular frame line, respectively, so that the planar light emitters 9A and 9B emit light. Thus, the automobile driver, the bicycle rider, the motorcycle rider or the pedestrian may find, while exhibiting a surprise to some extent, the display of the characters "STOP" which have suddenly appeared. Therefore, the sign represented by the characters can be effectively recognized, resulting in contribution to the safety of traffic.

When the sun rises, the sunset sensor 6 terminates to output the sunset detecting signal, so that the light emitting diodes 10 are put out by the control unit 15 and that no more light is emitted from the planar light emitters 9A and 9B even if the detecting signal is outputted from the proximity sensor 5. Thus, the planar light emitters 9A and 9B emit light during detection of sunset by the sunset sensor 6.

Referring to FIGS. 4(A) and 4(B), FIGS. 5(A) and 5(B) and FIGS. 6(A) and 6(B) corresponding to FIG. 1(A) and 1(B), respectively, there are shown various modifications of the signboard 1 of the above embodiment.

In the modification shown in FIGS. 4(A) and 4(B), the signboard panel 3 has a box-like configuration and is formed integrally with the control unit 15. The solar battery 4 is mounted on the rear side of the signboard panel 3 or the control unit 15.

In the modification shown in FIGS. 5(A) and 5(B), the signboard panel 3 has an enlarged thin box-like configuration.

In the modification shown in FIGS. 6(A) and 6(B), the signboard panel 3 has an enlarged box-like configuration and is formed integrally with the control unit 15. The solar battery 4 is mounted on the rear side of the signboard panel 3 or the control unit 15.

Claims

1. A luminescent signboard comprising;
 - a base plate;
 - a first light emitting means disposed on said base plate and having a configuration corresponding to a predetermined sign;
 - a second light emitting means disposed on said base plate at a different position from said first light emitting means;
 - sunset sensor means operable to detect sunset;
 - proximity sensor means operable to detect an object or a person which or who has come to a position within a predetermined distance from the signboard;
 - a power source for supplying power to said first and second light emitting means, said sunset sensor means and said proximity sensor means; and
 - control means operable to connect said power source to said second light emitting means so as to permit emission of the light therefrom when said sunset sensor means detects sunset, said control means being operable to connect said power source to said first light emitting means so as to permit emission of light therefrom when said proximity sensor means detects an object or a person during detection of sunset by said sunset sensor means.
2. The luminescent signboard as defined in claim 1 wherein said first light emitting means includes a planar light emitter and wherein said second light emitting means includes a flickering light emitter.
3. The luminescent signboard as defined in claim 2 wherein a plurality of said flickering light emitters are disposed along the peripheral portion of said base plate and are substantially equally spaced from each other.
4. The luminescent signboard as defined in claim 1

wherein said power source is a battery chargeable by sunlight.

5. The luminescent signboard as defined in claim 1 and further including a plate made of weather-resistant polycarbonate so as to cover said base plate and said first and second light emitting means, and including a high-intensity reflection sheet attached to said backing plate and having said predetermined sign drawn thereon. 5 10
6. The luminescent signboard as defined in claim 1 wherein said proximity sensor means is sensitive to thermal changes. 15
7. The luminescent signboard as defined in claim 1 wherein said predetermined sign includes a character portion and a frame portion surrounding said character portion. 20

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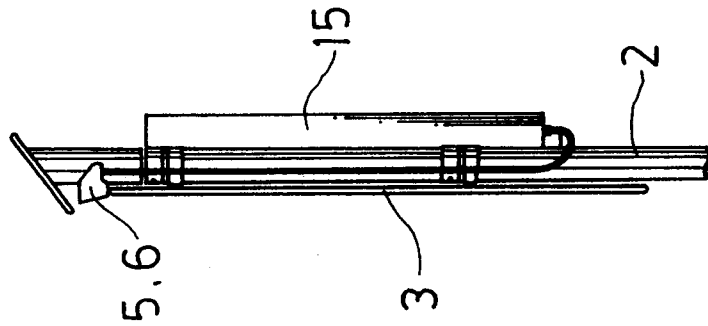
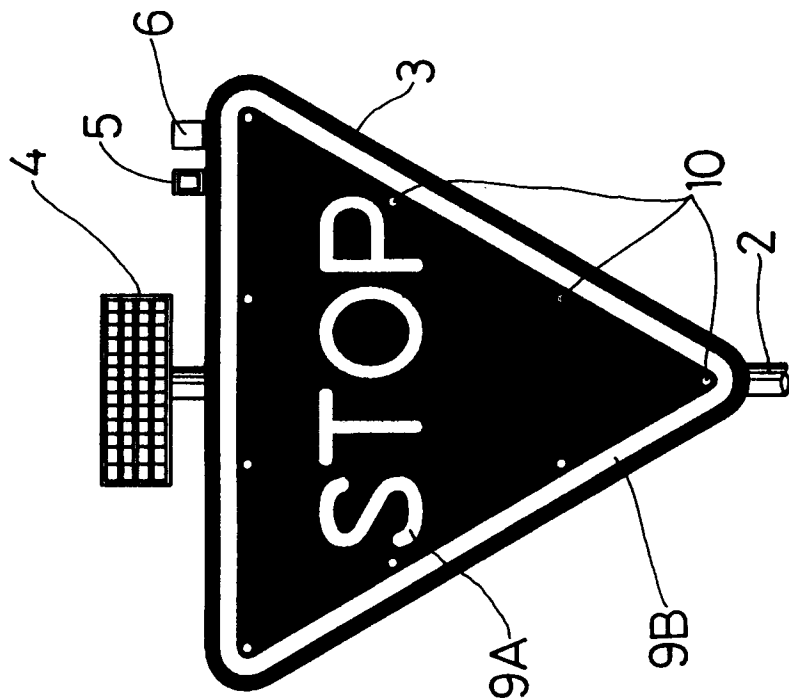
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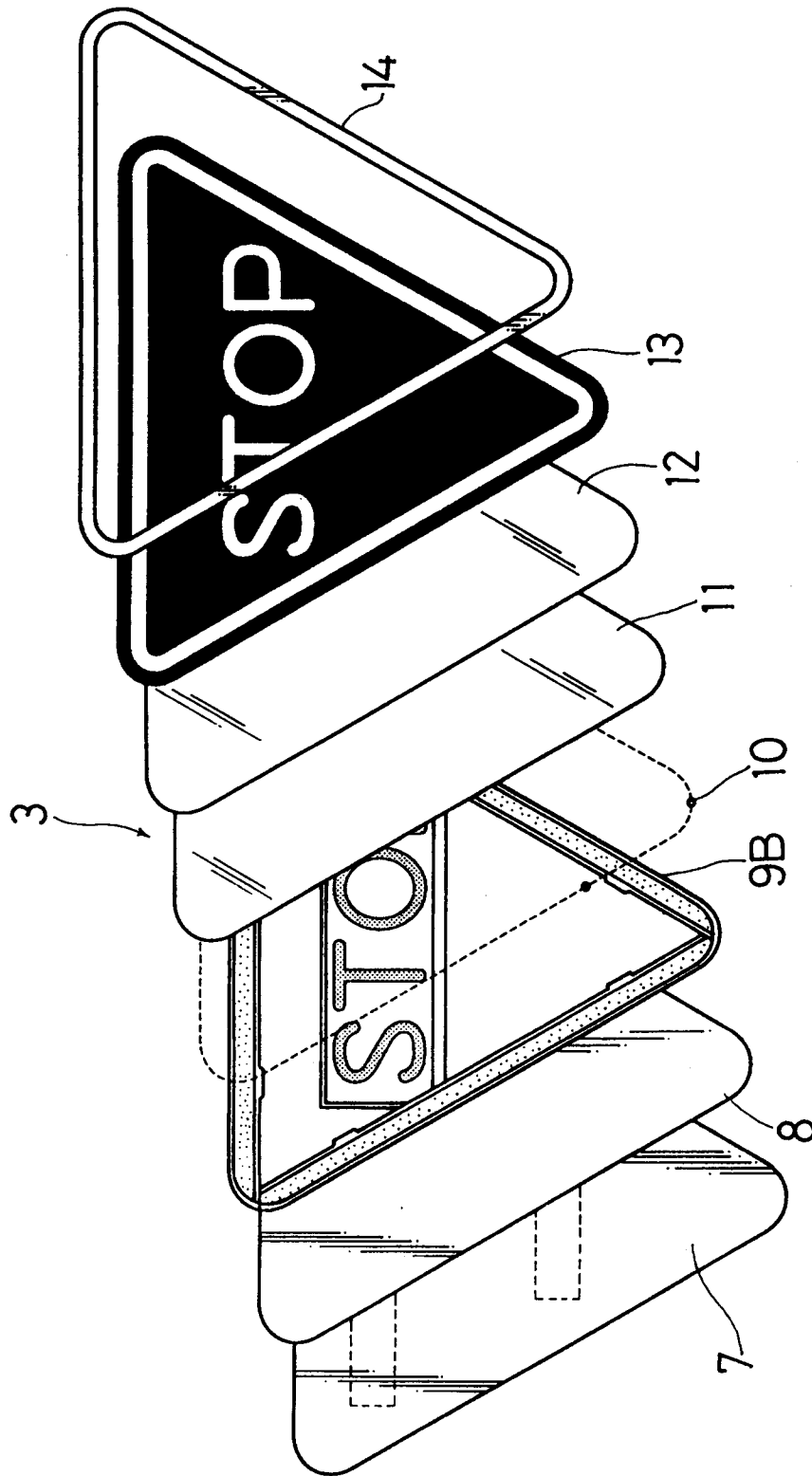


FIG. 2

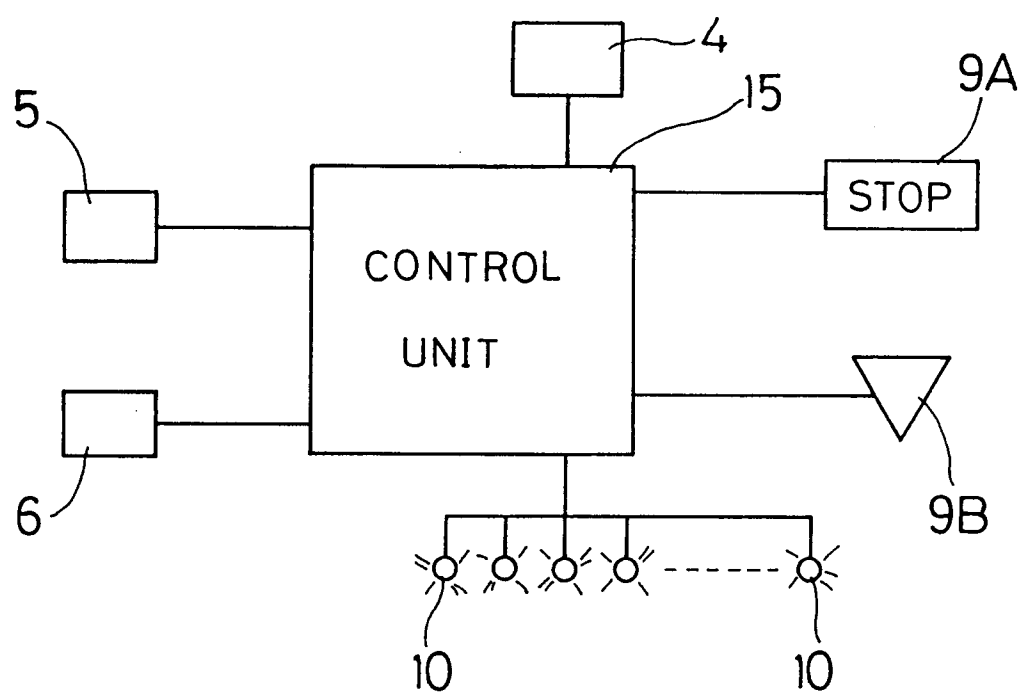


FIG. 3

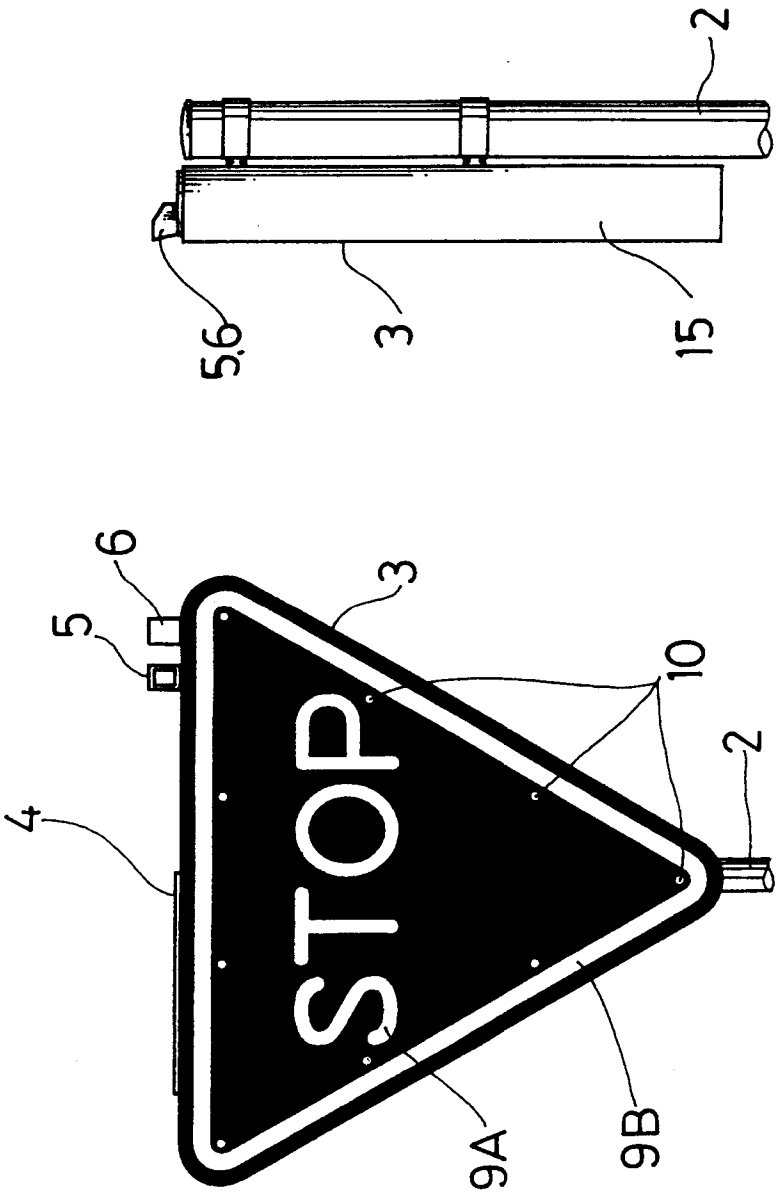


FIG. 4(B)

FIG. 4(A)

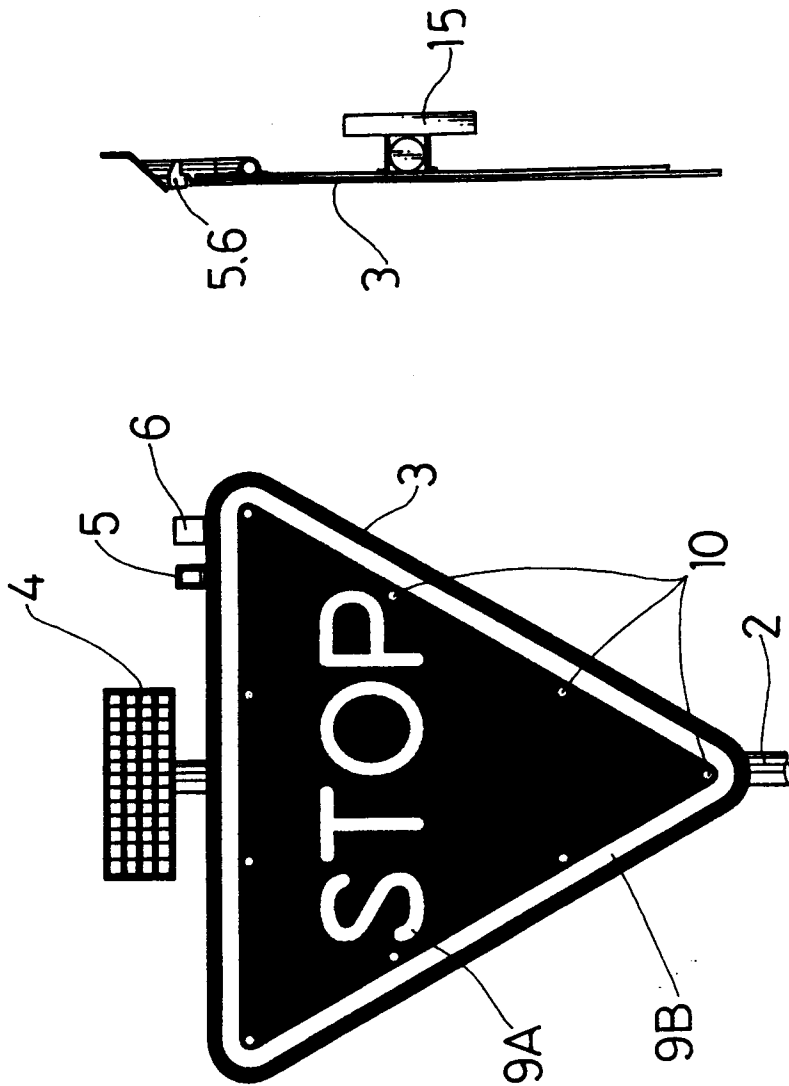


FIG. 5(B)

FIG. 5(A)

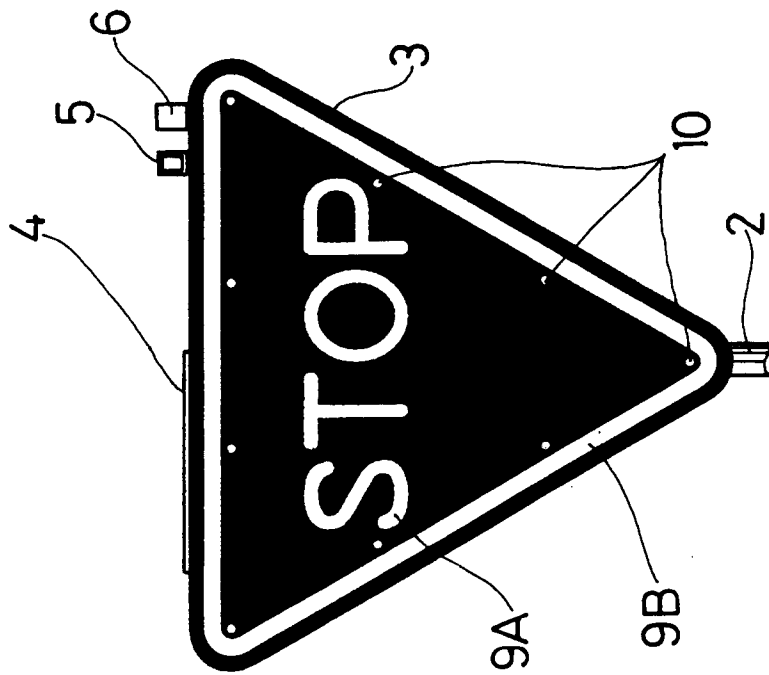


FIG. 6(A)

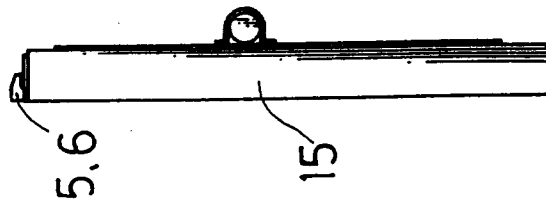


FIG. 6(B)



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 94 30 2797

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
X	EP-A-0 422 695 (MINNESOTA MINING AND MANUFACTURING CO.) * column 4, line 40 - column 5 *	1,2,4	G09F13/22 G08G1/09
Y	DE-A-40 42 044 (KOBAYASHI, SOUJI, KAWAGUSHI, SAITAMA) * column 1, line 46 - column 3, line 12; claims 1,2; figure 1 *	1,2,4,7	
Y	EP-A-0 516 059 (D. SWAROWSKI & CO.) * claims 1,9-11; figure 1 *	1,2,4,7	
A	FR-A-2 663 771 (OLLIVIER J.) * claims 1-4; figures 1,2 *	1,2,4,7	
			TECHNICAL FIELDS SEARCHED (Int.Cl.5)
			G08G G09F
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		16 September 1994	Hulne, S
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