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(54) **System and device for directing observation**

(57) The first aspect of the invention is a system for directing the attention of a moving person. The system comprises a control device and a system element functionally in connection with it. The system is characterized in that the control device comprises communication means for forming a wireless or wired connection and

transferring information with the system element, and the system element comprises an illumination element, the illumination of which is arranged to be controlled by a control device. The other aspects of the invention comprise a sign and a control device.

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Description

FIELD OF THE INVENTION

[0001] The invention relates in general to illumination. In particular, the invention relates to illumination of objects in order to focus attention on the object.

PRIOR ART

[0002] In illuminated objects according to prior art, for example, signboards, different techniques are used for illuminating an object. For example, the visibility of traffic signs can be improved according to prior art by placing a light fixture above the traffic sign, the light of which hits the reflective surface of the traffic sign. Another means according to prior art is to form from light-emitting diodes (LED) the word, number or pattern of the traffic sign or other signboard.

[0003] In addition, especially signboards and advertisements are illuminated by illuminating, from its side, a plastic or glass sheet placed in front of the signboard. In solutions according to prior art, there are also used merely a plastic or glass sheet illuminated from the side, onto which is ground, etched or engraved the desired pattern, wherein the light moving inside the sheet scatters from the treated area and forms the desired pattern.

[0004] Solutions according to prior art work quite well in the dark or under poorly illuminated conditions, but their visibility and attention value under well-illuminated conditions is clearly weaker.

OBJECT OF THE INVENTION

[0005] One object of this invention is to provide a technology, by which the attention of a traveller can be focused by illuminating the object in the field of vision of the traveller. Another object is to increase the attention value of the object under poorly illuminated conditions by substantially lowering the attention value of the same object under well-illuminated conditions.

BRIEF DESCRIPTION OF THE INVENTION

[0006] The first aspect of the invention is a system for directing the attention of a moving person. The system comprises a control device and a system element functionally in connection with it. The system is characterized in that the control device comprises communication means for forming a wired or wireless connection and transferring information with the system element, and the system element comprises an illumination element, the illumination of which is arranged to be controlled by a control device.

[0007] The second aspect of the invention is a sign comprising a body, an illumination element in connection with the body, a patterned film arranged to be illuminated by the illumination element, and communication means

for receiving at least illumination information. The sign is characterized in that the patterned film is an at least partially light-reflecting film, and that the illumination element is arranged to illuminate the film from the back on the basis of the illumination information to be received such that the film is between the illumination element and a possible moving person, i.e. the observer of the sign.

[0008] In one embodiment, the sign is characterized in that the illumination element comprises a translucent sheet and a light source arranged in connection with at least one edge of the sheet.

[0009] In one embodiment, the sign is characterized in that said sign is a traffic sign. In one embodiment, the sign is another object, preferably a shield or signboard.

[0010] The third aspect of the invention is a control device, which is characterized in that it comprises communication means for forming a wireless or wired connection and transferring information, and at least one of the following indicators: a timer, twilight sensor, motion sensor, radar, camera and an audio device.

[0011] In one embodiment, the control device is characterized in that it is arranged to send information observed by one or more indicators regarding the occurrence of a predetermined event.

[0012] In one embodiment, the control device is characterized in that it comprises a diagnostic indicator for forming diagnostic information, and that its communication means are arranged to send diagnostic information in a predetermined manner.

[0013] In one embodiment, the control device is characterized in that it is arranged to be installed in a vehicle, and that said communication means are arranged for forming a connection and transferring information with other control devices.

[0014] In one embodiment of the first aspect of the invention, the system is characterized in that the system element is a sign according to the second aspect of the invention or some embodiment thereof.

[0015] In one embodiment of the first aspect of the invention, the system is characterized in that the control device is a sign according to the third aspect of the invention or some embodiment thereof.

[0016] In one embodiment, the system is characterized in that the system element is an alert light arrangement arranged to be installed in a vehicle, which is arranged to receive information from the control device and to control the illumination element on the basis of said information, as needed.

[0017] In one embodiment, the system is characterized in that the control device of the system is a control device according to one embodiment of the third aspect of the invention, wherein the sign is arranged to employ, as illumination information, the information sent by the control device regarding the occurrence of a predetermined event detected by one or more indicators.

[0018] One embodiment is an arrangement in connection with a traffic sign, wherein in connection with the board part of the traffic sign belongs a light fixture, by

which the information surface of the board part can be illuminated, a power source, such as an accumulator and/or a solar panel, and a control unit for controlling operations. The arrangement is characterized in that, for showing the traffic sign, the arrangement includes a series of traffic signs formed by a web to be reeled around rotating rollers, of which the desired sign can be transferred to the location of the information surface and illuminated in that location, and that the arrangement further includes, for reeling the web, a motor that functions under control to rotate the rollers.

[0019] In one embodiment, the arrangement is characterized in that the information surface is a transparent sheet, to the edge of which is attached a LED light fixture and the light of which is conducted along said sheet to hit the traffic sign attached to the web provided with a reflective surface.

[0020] In one embodiment, the arrangement is characterized in that the information surface is a transparent sheet, which is arranged to protect the traffic sign, and to the rear side of the traffic sign, such as a reflective adhesive sign, is arranged a LED light fixture at the edge of the other transparent sheet to illuminate the traffic sign through said sheet.

[0021] In one embodiment, the arrangement is characterized in that rotation of the rollers and changing of the traffic sign is arranged to be occurred by remote control, for example, via a 3G network.

DETAILED DESCRIPTION OF THE INVENTION

[0022] In the following, the invention is described in greater detail with reference to the exemplified preferred embodiments and accompanying figures, in which

Fig. 1 shows a structure of a sign according to one embodiment of the invention,
 Fig. 2 shows a sign according to one embodiment of the invention,
 Fig. 3 shows a schematic view of a system according to one embodiment of the invention,
 Figs. 4 and 5 show one embodiment, in which the sign is changeable,
 Fig. 6 shows the conduction of LED light to a transparent sheet, and
 Fig. 7 shows another means of conducting LED light to a transparent sheet.

[0023] Figs. 1 and 2 show a sign 10 according to one embodiment of the invention. In Fig. 1 is shown a structural view of the sign. Preferably, the sign 10 is comprised of a body 12a, 12b, an illumination element 18 in connection with the body, a patterned film 14 and communication means 20. In this embodiment, the sign is a traffic sign indicating a pedestrian crossing, but it can also be another traffic sign, for example, a traffic sign indicating an obligation to yield, mandatory stop or the speed limit. In another embodiment, the sign 10 can also be some

other object, to which it is desired to focus the attention of a traveller, such as, for example, a billboard, signpost, or signalling device.

[0024] The body of the sign comprises a frame, which is preferably of plastic, plastic blend, composite or metal. The body can be made sign-specifically suitable taking the use environment into consideration. For example, in outdoor use, the body is preferably waterproof, weather-proof and suitable for outdoor use, for example, according to protection class IP65.

[0025] An attachment mechanism 22 can be attached to the body, by which the sign can be attached, for example, to a post. Preferably, in the case of a traffic sign, installation occurs at the head of a metal pipe. The attachment mechanism 22 can, in one embodiment, comprise two nested pipes, of which the outer one is greater in diameter and the inner one is smaller in diameter than the pipe, to which the sign is attached. The outer pipe can have, for example, a screw or bolt, the tightening of which serves to attach the sign to the post. To the inside of the inner pipe can be arranged, for example, accumulators or batteries as the power source of the sign or its peripheral devices, wherein they are easily replaceable by lifting the sign off the head of the pipe.

[0026] Preferably, the illumination element 18 consists of a highly translucent portion, such as, for example, a sheet 26. The sheet 26 can be made, for example, from different kinds of plastics, plexiglass, glass or combinations thereof. Preferably, the sheet 26 is illuminated by a light source 24 in connection with at least one edge thereof. On those edges, where there is no light source, it is preferred to arrange a reflective surface, which reflects the light coming from inside the sheet and hitting that edge back inside the sheet. In one embodiment, the sheet can also be illuminated from its back, if thinness of the structure is not important. Preferably, as the light source 24 is used one or more light-emitting diodes (LED) due to their low power consumption, speedy manoeuvrability and long service life. Other light sources 24, such as incandescent lamps, fluorescent tubes and cold cathode tubes, can also be used as illumination sources in some embodiments. Preferably, the light source is cooled, particularly when using light-emitting diodes, in order to lengthen the service life of the light source.

[0027] On the front surface of the illumination element 18 is a patterned film 14, which has the desired pattern of the sign. By front surface is meant, in this case, the surface that remains predominantly visible, when the sign is in operating condition, i.e. the surface an observer of the sign sees. Thus, from the viewpoint of the observer, the light of the illumination element comes through the film. Preferably, in the case of a two-sided sign, one sheet (26) is used, on both sides of which is placed a patterned film 14, and the sheet is illuminated from the edge, wherein the illuminated sign looks the same when seen from the front or the back. Between the sheet 26 and the patterned film 14, there can be a thin sheet 16, to which the patterned film 14 is attached, wherein, at need, it is easier

to change than a patterned film 14 attached directly to the illumination element 18. In one embodiment, the patterned film 14 and/or the illumination element 18 is arranged to be easily changeable for changing the message or facilitating maintenance.

[0028] The patterned film 14 can have several different patterns, from which the desired pattern can be selected according to the situation. Different patterns can be brought forth, for example, by illuminating the film from a different direction, showing a different area of the film or by suitably controlling the illumination element. By patterned film can, in some embodiments, be meant, in addition to a separate film, also a pattern arranged directly on the front surface of the illumination element, which is formed, for example, by painting, sanding, engraving, etching, and/or some other surface treatment method.

[0029] In embodiments, in which the sign 10 is a traffic sign, the patterned film is preferably substantially the same kind of film used in traditional traffic signs as attached on the surface of a wood-based sheet. Such films used in the traffic signs are reflective, so they are highly visible in twilight and in the dark, even when the illumination element does not illuminate but light hits the sign from the outside, such as, for example, from the headlights of a vehicle. Thus, in the case of a traffic sign, when the sign 10 is turned off, for example, due to maintenance or other conditions, the sign still works like a conventional traffic sign.

[0030] The communication means 20 of the sign 10 enable controlling the illumination of the sign. The communication means 20 are arranged at least to receive the illumination information, but preferably they are also arranged to send information from the sign 10 either to a control device 30 or to some other device. In its most simple form, the communication means 20 may be a pair cable, in which the illumination information is expressed as a variation in voltage. Preferably, the communication means 20 is a wireless radio transceiver, which is capable of communicating with external devices, such as other signs, control devices and/or a control room. For a wireless connection, there are many different manners of implementation, frequencies and protocols, the significance of which is small for the final result, when the amount of data to be transferred is very small. In addition to radio waves, the communication of wireless communication means can also be based, for example, on sound, light or some other wireless manner of communication.

[0031] When the sign 10 comprises wireless communication means 20, the sign has an energy source 25, from which the sign receives the electrical energy it requires. The energy source 25 can be, for example, a connection to the power-distribution network, an accumulator, a single-use battery, an energy harvester and/or some other energy source.

[0032] In addition, the sign 10 can have an illumination device comprising a light source and one or more patterned lenses. The illumination device is situated such

that as the light of the light source travels through the lens, it reflects onto the desired surface forming the pattern patterned in the lens. For example, in the case of a traffic sign, the illumination of the illumination device can be directed toward the surface of the road, wherein at the area of the sign can be illuminated on the road, for example, a warning text, stop line, speed limit, pedestrian crossing hatching, or other text or symbol. Illumination can be arranged by the light source in the desired colour and as flashing, if needed. In one embodiment, the sign is a traffic sign indicating a pedestrian crossing, which has an illumination device that is arranged to illuminate the bicycle and pedestrian traffic waiting to cross the pedestrian crossing.

[0033] The control device 30 comprises communication means 36 for forming a wireless or wired connection, and transferring information. In one embodiment, the communication means 36 allow sending of illumination information to the sign for controlling illumination. The communication means are arranged at least to send the illumination information, but preferably they are arranged to also send and receive information with several system elements 40, signs 10, control devices 30, indicators 31, 32, 33 and/or other devices. In its most simple form, the communication means 36 can be a pair cable. Preferably, the communication means 36 is a wireless radio transceiver, which is capable of communicating with external devices, such as signs, other control devices and/or a control room. For a wireless connection, there are many different manners of implementation, frequencies and protocols, the significance of which is small for the final result, when the amount of data to be transferred is very small. In addition to radio waves, the communication of wireless communication means can also be based, for example, on sound, light or some other wireless manner of communication.

[0034] The control device 30 comprises at least one of the following indicators 31, 32, 33: a timer, twilight sensor, motion sensor, radar, camera and an audio device. On the basis of the signal given by the indicator, the control device sends the information regarding the observation directly to the system element 40, for example, to the sign 10, or through one or more other control devices. The information regarding the observation can comprise, for example, illumination information, speed measured by the radar, brightness detected by the twilight sensor and/or other observed information. Preferably, for the control of one sign 10, several control devices may be used and with one control device several signs may be controlled. For example, the control device in connection with the pedestrian crossing traffic sign can send information to signs on both sides of the road, when the indicator observes a predetermined event, for example, the approach of a pedestrian. In one embodiment, the communication means of the control devices are arranged as equally valuable, wherein they forward the information they receive. In another embodiment, the communication means of the control devices are arranged to manage,

handle, receive and/or send information, for example, from a control centre or control room for configuration of the control device, wherein several control devices and signs possibly in connection with them can be centrally managed.

[0035] In one embodiment, the control device 30 has a diagnostics indicator, which monitors internal and/or external events of the control device and/or internal and/or external events of the signs and devices in connection with the control device. In one embodiment, to the diagnostics indicator can be sent, for example, information regarding detected faults in the illumination element 18 of the sign 10 or the condition of the energy source 25, such as the charge remaining in the accumulators or batteries. In another embodiment, the diagnostics indicator may gather information from the information of one or more indicators 31, 32, 33 of the control device 30. This characteristic can be used, for example, in a transport census, when the element is configured also for that purpose. Depending on the indicators 31, 32, 33 of the control device 30, a traffic census can be directed, for example, to the number of pedestrians, number of adults/children/bicyclists crossing a pedestrian crossing, car speeds, number of automobiles/heavy traffic vehicles, number of travellers passing the sign on a given side or any other quantity the indicators of the control device can identify. The sign 10 can also have a diagnostic indicator for forming and sending diagnostic information, for example, to the control device. Preferably, the diagnostic information gathered by the diagnostic indicator can be sent from the control device 30 by the communication means 36 to a predetermined location, for example, to a centre or control room.

[0036] The control device 30 works on electrical current, which is supplied to the control device from the power source 34, such as, for example, from the power-distribution network, an accumulator, single-use batteries, an energy harvester and/or some other energy source. In one embodiment, the control device 30 is located in connection with one embodiment of the sign 10 described previously. In the same context, accumulators or batteries in connection with the entity formed by the control device and the sign can be used as the energy source, wherein the system is physically compact in size and easily installed.

[0037] In one embodiment, the communication means 36 of the control device 30 are arranged to send information to the system element 40. The system element 40 can be located in a vehicle, for example, as a separate alert light in connection with a navigation device, instrument panel or audio system. Preferably, the system element is arranged to communicate with the vehicle and its peripheral devices as well as to receive information from the control device 30. The control device 30 can send the information to the system element 40, for example, of an approaching intersection, dangerous situation or changing speed limit, wherein the system element 40 implements predetermined measures. These meas-

ures can comprise, for example, controlling the illumination element 18, producing an audio signal and/or controlling the devices of the automobile.

[0038] The embodiments described in the application can be combined mutatis mutandis. For example, one embodiment of the invention is the system described in Fig. 3, which comprises control devices 30 according to one embodiment described above and, in connection with it, system elements 40, which are signs according to one embodiment described above. One example of such a system is an alert system in connection with a pedestrian crossing. This exemplified system comprises a system element 40, which is the above-described illuminated sign indicating a pedestrian crossing, which has, in connection with it, a control device 30 comprising a twilight sensor 31 and a motion sensor 32 and some third sensor 33. In the event that the twilight sensor 31 of the control device 30 detects that it is twilight or dark, and the motion sensor 32 detects a bicycle or pedestrian user approached the pedestrian crossing, the control device 30 sends this information to the system element 40 by the radio transmitter 36. The system element 40 receives the information of the control device 30 and activates the illumination element 18, wherein the pedestrian crossing sign is seen as illuminated to automobiles approaching the pedestrian crossing as an indication that there is a pedestrian crossing ahead and someone will be crossing it soon. The information sent by the control device 30 is received in all system elements 40 related to the pedestrian crossing in question, i.e. in this example pedestrian crossing signs, whose illumination elements all activate in order that automobiles approaching also from the opposite direction are able to notice the situation. The system is particularly effective, because it activates when someone is in the pedestrian crossing or in its vicinity. As another example, a traffic sign indicating an intersection can also be implemented in a corresponding manner.

[0039] In one embodiment, to provide a traffic sign provided with an changeable display, an arrangement has been developed, characterized in that, in order to display the traffic sign, the arrangement includes traffic signs formed on a web to be reeled around a series of rotating rollers, of which the desired sign can be transferred to the area of the information surface and illuminated in that area, and that the arrangement further includes, for reeling the web, a motor that functions under control to rotate the rollers.

[0040] With very low power consumption, the sign can be illuminated in times of darkness sufficiently well so that the sign will be noticed. The sign is normally visible in the dark even if its illumination were to be turned off. By some preferred mechanical means, the sign can be changed to another also remotely, for example, through a telephone network. There is also a mechanical crank on the side of the sign for rotating the rollers and changing from one sign to another.

[0041] Fig. 4 shows a traffic sign from the front. The sign is located in a housing 1, and the housing includes

a front wall 2 larger than the sign, which preferably can function as a solar panel. It is also possible to provide the back wall and the top of the housing with solar panels.

[0042] The side view of Fig. 5 shows a view from the inside of the housing 1 with the side wall removed. The housing has two rotating rollers 3, through which from one roller to the other can be reeled the web 4, which contains different kinds of traffic signs provided with a reflective surface. In front of the web 4 is a transparent sheet 5, onto which is adapted illumination from a LED light string 6 that encircles the sheet. The LED light is conducted inside the sheet 5 and from there toward the reflective sign in the web 4. With low energy consumption, into the sign can be obtained adequate self-powered reflection in times of darkness. The housing has a twilight sensor, which switches on the illumination of the sign when darkness comes.

[0043] When it is desired to change the traffic sign to another sign on the web 4, the rollers 3 are rotated to move the desired sign to the area of the sheet 5. The accumulator charged by the solar panels in the housing rotates the rotation motor of the rollers 3, until the desired sign is in the area. In this version, there is a control unit inside the housing, which adjusts the rotation of the rollers on the basis of a command coming from the remote control. The command can come, for example, through a telephone network. The rotation motor is most conveniently a stepper motor, whose rotation is controlled. On the side of the housing 1 is, in one version, a connection for rotation of the rollers to be carried out by a crank.

[0044] In Fig. 6, there is one transparent uniformly thick plastic sheet 5, whose placement is in front of a reflective traffic sign sticker as protection for it. The LED light to this sheet is conducted from a LED light string 6 encircling the edge of the sheet 5. From inside the sheet 5, the light can be made to turn toward the reflective sign, for example, by treating the surface of the sheet 5, on the side with the sign, with very small, for example, scorings using laser technology.

[0045] In Fig. 7, there is a transparent sheet 7, inside which LED light is conducted from a LED light string 6 in the area of a ring-like separation 9 in the sheet. Part 8 is a thicker portion of the sheet than part 7. Part 8 is larger than the traffic sign, wherein the LED light string 6 remains behind the front wall 2 of the housing 1.

[0046] In one embodiment, a sheet similar to the sheet 5 and LED light string 6 are located at the back of the traffic sign, wherein the light comes from behind to the traffic sign sticker or through it and the sign begins to reflect light. In the front of the sign is only a protective transparent sheet, such as the sheet 5 without a LED light.

[0047] To the person skilled in the art it is obvious that the exemplified embodiments presented above are, for purposes of clarity, relatively simple examples both in structure and function. Following the model presented in this patent application it is possible to construct different and quite complicated solutions that utilize the inventive

thought presented in this patent application.

Claims

1. A system for directing the attention of a moving person, which system comprises a control device (30) and a system element (40) functionally in connection with it, **characterized in that** the control device (30) comprises communication means for forming a wireless or wired connection and transferring information with said system element (40), and the system element (40) comprises an illumination element (18), the illumination of which is arranged to be controlled by a control device (30).
2. A sign (10) comprising a body (12a, 12b), an illumination element (18) in connection with the body, a patterned film (14) arranged to be illuminated by the illumination element (18), and communication means (20) for at least receiving the illumination information, wherein the sign is **characterized in that** said patterned film (14) is an at least partially light-reflecting film, and that the illumination element (18) is arranged to, on the basis of the illumination information to be received, illuminate said film (14) from the back such that the film (14) is between the illumination element (18) and a possible observer.
3. A sign (10) according to claim 2, **characterized in that** the illumination element (18) comprises a translucent sheet (26) and a light source (24) arranged in connection with at least one edge of said sheet (26).
4. A sign (10) according to claim 2, **characterized in that** said sign (10) is a traffic sign.
5. A control device (30), **characterized in that** it comprises communication means (36) for forming a wireless or wired connection and transferring information, and at least one of the following indicators (31, 32, 33): a timer, twilight sensor, motion sensor, radar, camera and an audio device.
6. A control device (30) according to claim 5, **characterized in that** it is arranged to send the information regarding the occurrence of a predetermined event detected by one or more indicators (31, 32, 33).
7. A control device (30) according to claim 5, **characterized in that** it comprises a diagnostic indicator for forming diagnostic information, and that said communication means (36) are arranged to send said diagnostic information in a predetermined manner.
8. A control device (30) according to claim 5, **characterized in that** it is arranged to be installed in a ve-

hicle, and that said communication means (36) are arranged for forming a connection and transferring information with other control devices (30).

9. A system according to claim 1, **characterized in that** said system element (40) is a sign (10) according to any one of claims 2-4. 5
10. A system according to claim 1, **characterized in that** said control device (30) is a control device (30) according to any one of claims 5-8. 10
11. A system according to claim 10, **characterized in that** said system element (40) is an alert light arrangement arranged to be installed in a vehicle, which is arranged to receive information from the control device (30) and to control the illumination element (18) on the basis of said information, as needed. 15
- 20
12. A system according to claim 9, **characterized in that** the control device (30) of the system is a control device according to claim 6, wherein said sign (10) is arranged to employ, as said illumination information, the information sent by the control device (30) regarding the occurrence of a predetermined event detected by one or more indicators (31, 32, 33). 25
- 30
13. A system according to claim 9, **characterized in that** at least one of the parts (14, 18) of the sign (10) is arranged to be changeable with another corresponding part (14, 18). 35
- 40
- 45
- 50
- 55

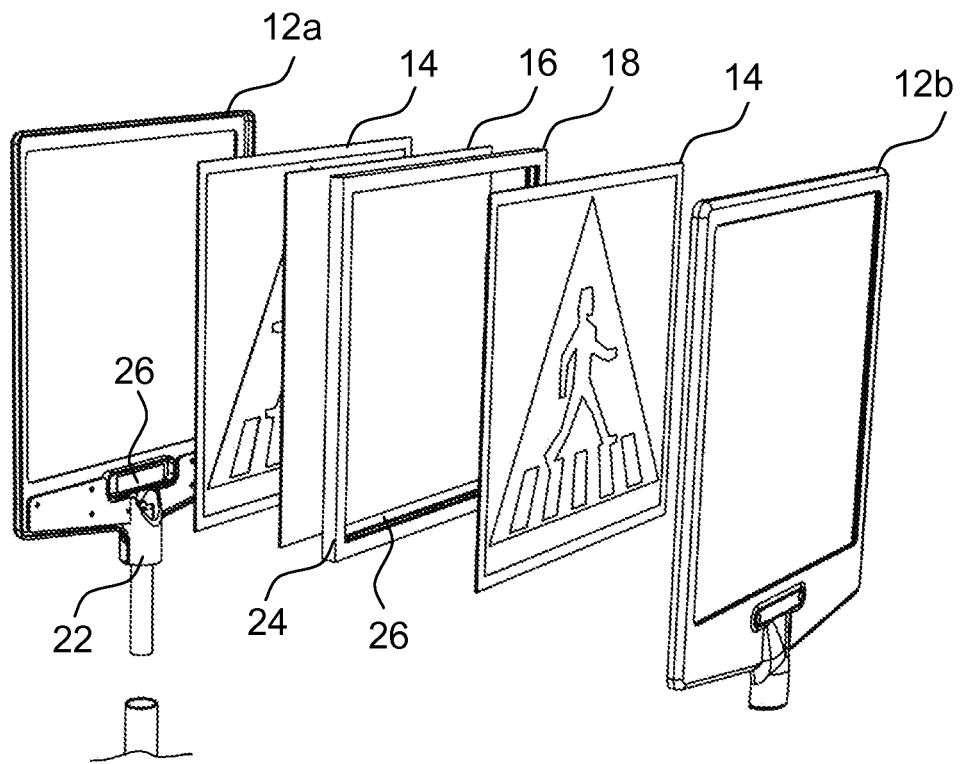


Fig. 1

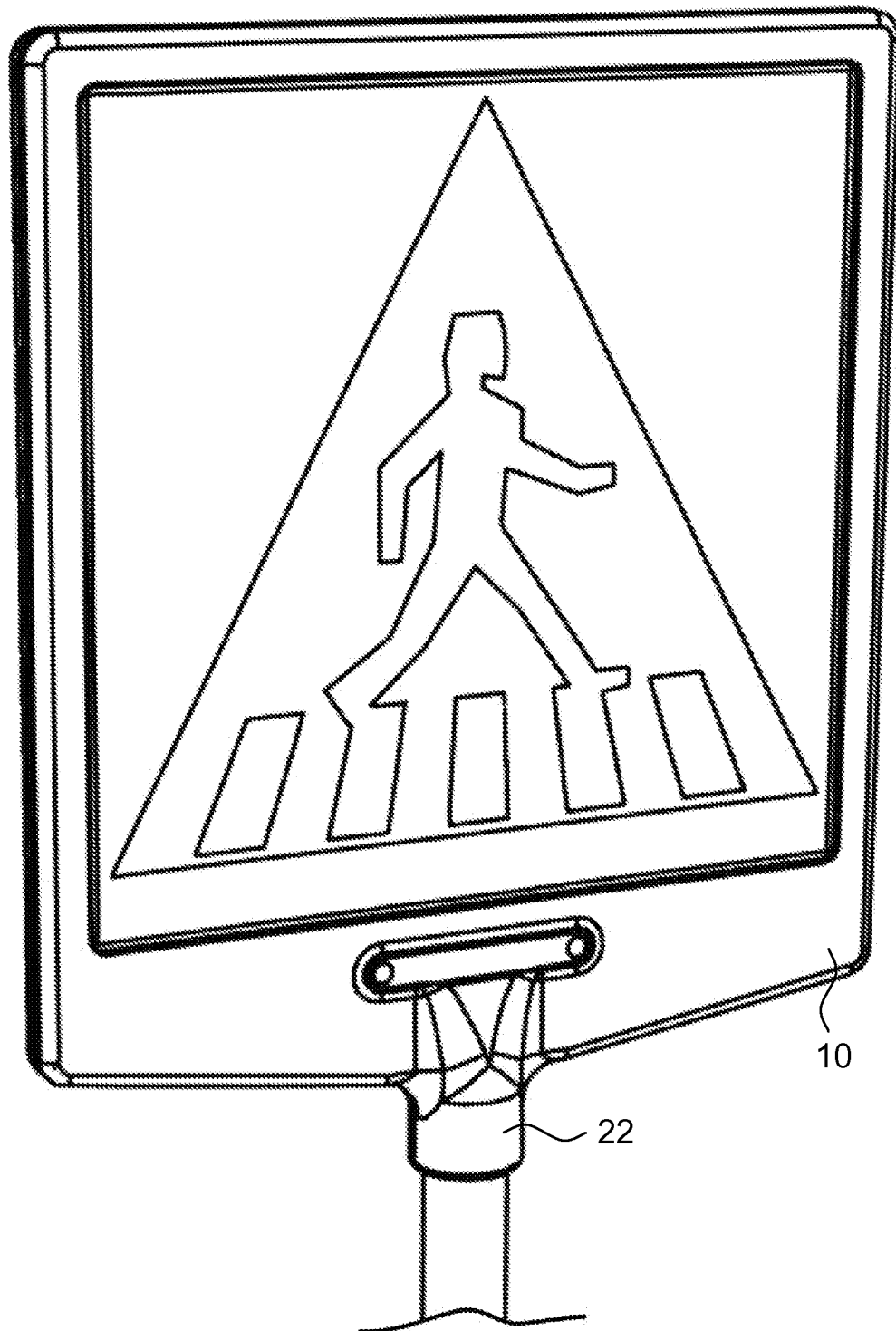


Fig. 2

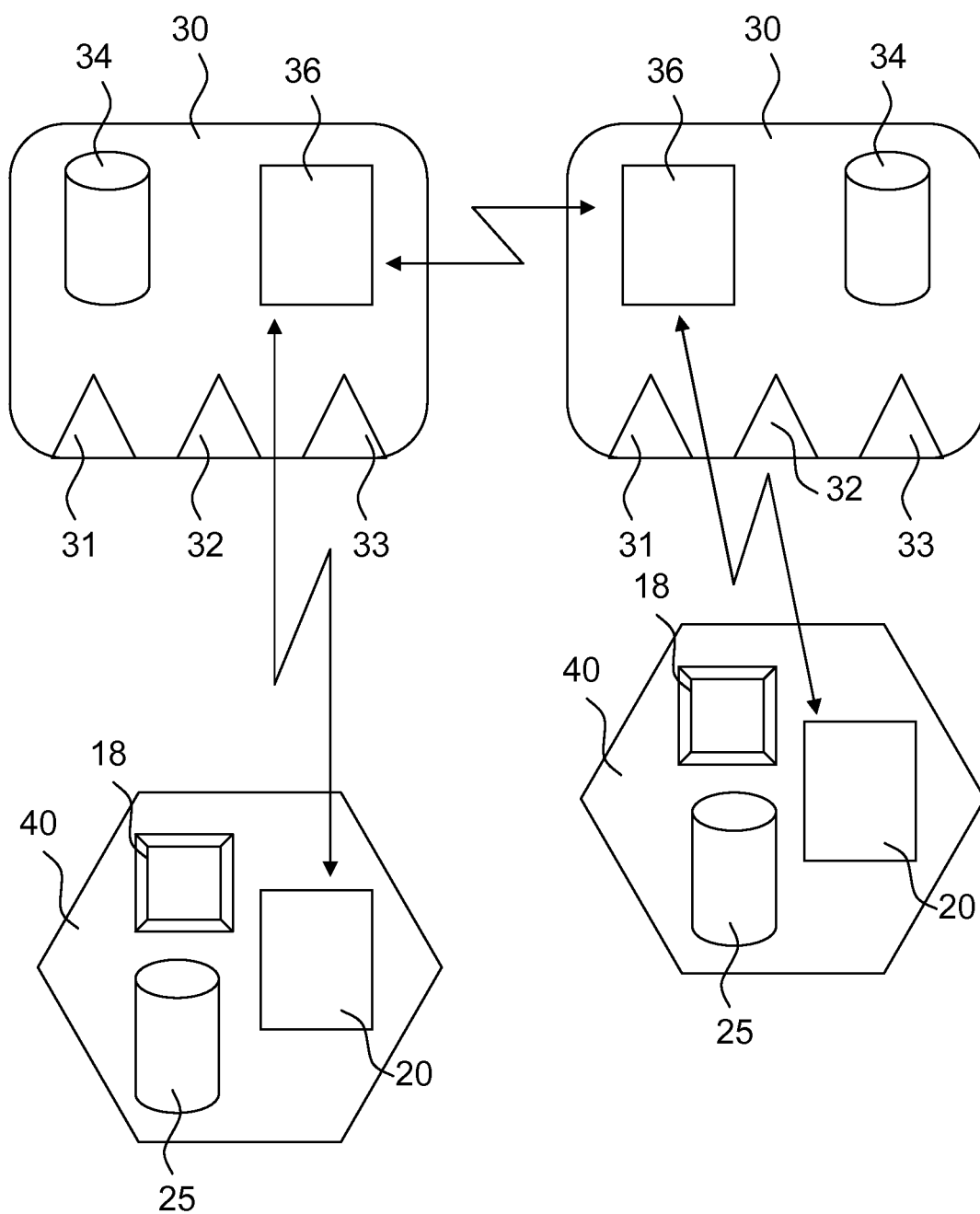


Fig. 3

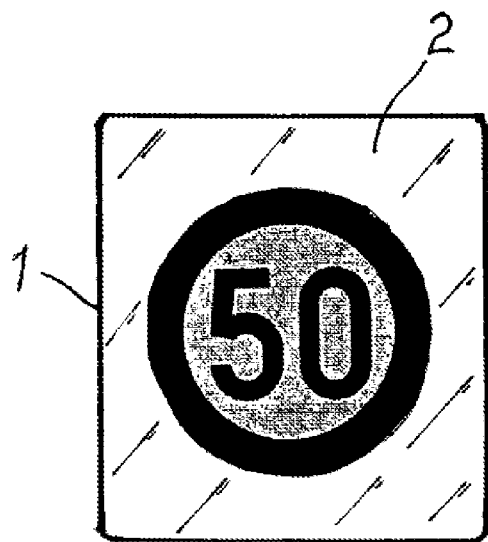


Fig. 4

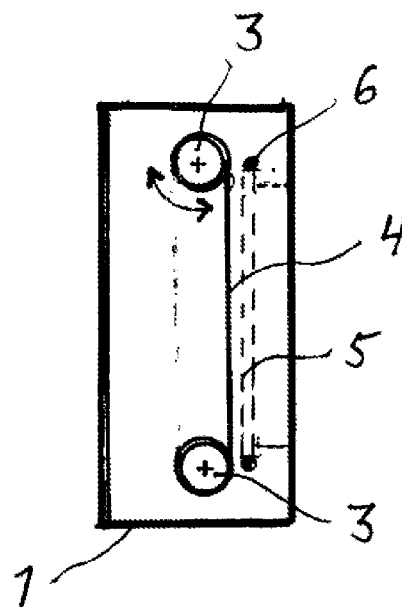


Fig. 5

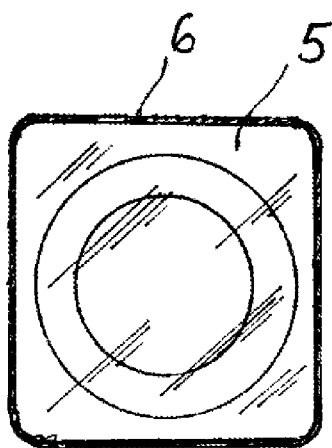


Fig. 6

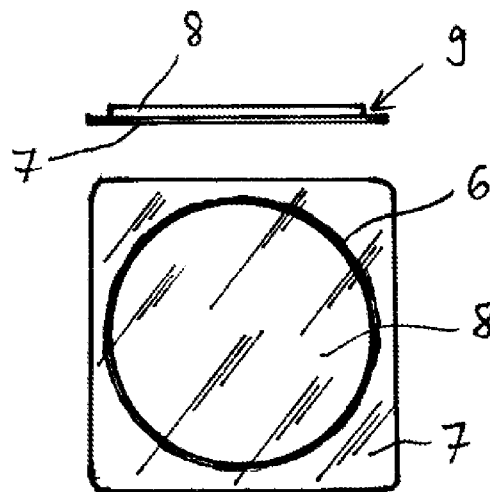


Fig. 7



EUROPEAN SEARCH REPORT

Application Number
EP 11 16 1664

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 10 2008 036313 A1 (VTC VOSSELER TRADING & CONSULT [CH]) 8 October 2009 (2009-10-08) * paragraph [0001] - paragraph [0002] * * paragraph [0042] - paragraph [0048] * * paragraph [0054] - paragraph [0065] * * claims 1-3 * * figures 1-5 *	1,2,4-7, 9-13	INV. G09F13/22 G09F27/00 G09F13/18 G09F11/26 G09F11/29 ADD. G09F7/18 G09F13/04
X	FR 2 798 214 A1 (NOERDINGER CLAUDE [FR]) 9 March 2001 (2001-03-09) * page 1, line 1 - line 7 * * page 3, line 29 - page 4, line 21 * * page 5, line 29 - line 34 * * figures 1-4 *	1,3-6	
X	DE 38 07 385 A1 (FEUERSENGER RUDOLF DIPL ING [DE]) 16 February 1989 (1989-02-16) * claim 1 * * column 2, line 39 - line 62 * * figures 1,2 *	1,2,4-6, 9,10	
X	DE 40 42 044 C1 (KOBAYASHY) 3 September 1992 (1992-09-03) * the whole document *	1,2,4-6, 9,10,12, 13	G09F G08B
X,P	US 2010/148989 A1 (HAWKINS MARK P [AU] ET AL) 17 June 2010 (2010-06-17) * paragraph [0001] - paragraph [0002] * * paragraph [0008] - paragraph [0011] * * paragraph [0021] * * paragraph [0068] - paragraph [0078] * * figures 1-7 *	1,4-6, 8-10	
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 19 July 2011	Examiner Pantoja Conde, Ana
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 11 16 1664

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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19-07-2011

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 102008036313 A1	08-10-2009	NONE	
FR 2798214 A1	09-03-2001	AU 7016400 A WO 0118776 A2	10-04-2001 15-03-2001
DE 3807385 A1	16-02-1989	NONE	
DE 4042044 C1	03-09-1992	NONE	
US 2010148989 A1	17-06-2010	AU 2009248422 A1	01-07-2010

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82