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(54) **AN INFORMATION DISPLAY AND A METHOD FOR MOUNTING A DISPLAY DEVICE OF AN INFORMATION DISPLAY**

INFORMATIONSDISPLAY UND VERFAHREN ZUM ANBRINGEN EINER DISPLAY-EINRICHTUNG
EINES INFORMATIONSDISPLAYS

ECRAN DE DONNEES ET PROCEDE DE MONTAGE DU DISPOSITIF D’AFFICHAGE D’UN ECRAN
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(56) References cited:
**GB-A- 2 022 899 GB-A- 2 227 590
US-A- 4 868 542 US-A- 5 724 161**

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Description

TECHNICAL FIELD OF THE INVENTION AND PRIOR ART

[0001] The present invention relates to an information display for a public transport vehicle, such as a bus or a train, having a display device comprising a plurality of display elements forming an information display surface visible from the outside of the vehicle and adapted to mostly indicate the destination and/or line number of the vehicle. Such information displays are normally arranged in the forward part, on both sides and in the rear part of the vehicle.

[0002] Such information displays according to a known type are arranged directly on frame members of the vehicle and in the roof area of the vehicle. Due to the size of the display device of the information display a comparatively large amount of space is required in the roof area, so that less space will be available for the passenger compartment. Would display devices of such known information displays be suspended directly in the passenger compartment with the aid of their securing means, they would constitute a source of danger for the passengers.

[0003] For solving these problems information displays of another type has been proposed. In this type of information displays the display device is arranged behind a window of said vehicle and the information display comprises a casing containing the display device and means for securing this casing of the information display to the inside of said window with the display elements close to the window.

[0004] Such an information display is known through for instance US 6 282 824 and EP 1 019 890.

[0005] Such an information display has several advantages. By using the window of the vehicle for securing the casing containing the display device of the information display said securing means has not to be adapted for securing said casing to a frame member of the vehicle and may by that be made lighter. Furthermore, by arranging the display elements close to the window, the casing will project substantially less far into the passenger compartment than casings of information displays of the other type mentioned above. Thus, the risks of injuries of passengers are remarkably reduced with respect to the latter information displays.

[0006] The present invention also relates to a method for mounting a display device of an information display behind a window of a public transport vehicle.

[0007] GB 2 227 590 A, GB 2 022 899A and US 4 868 542 A show information displays for vehicle having a LED-display device having light emitting diodes as display elements. The information display according to GB 2 221 590 A is configured to be arranged at the rear window of a vehicle.

[0008] This means that the casing containing the display device may with its content be made lighter and thinner

requiring less space, so that more space of the passenger compartment will be available for other purposes and risks of injuries of passengers will be further reduced. One reason for the possibility to obtain this is that light emitting diodes may be arranged very close to the inner surface of the window, since no distance is required between such a display element and the window surface for any movement in connection with a change of information state of the display element, in the case of a light emitting diode when turning it on or off, such as is the case when the display elements are part of a dot-matrix display device and have to be tilted for changing the information state. Furthermore, in the case of using light emitting diodes as display elements no further light sources are required for illuminating any display elements, since these are themselves emitting light, which means increased possibilities to a more compact construction of the display device. Moreover, a LED-display device is in itself light and compact increasing these features of the casing with content.

[0009] SUMMARY OF THE INVENTION

[0010] The object of the present invention is to provide an information display for a public transport vehicle being improved in at least some aspect with respect to information displays known according to the preamble of appended claim 1.

[0011] This object is according to the invention obtained by providing an information display comprising a circuit board, to the circuits of which said light emitting diodes are connected, and the circuits of said circuit board are arranged on the opposite side of the circuit board with respect to the arrangement of the light emitting diodes. It is normal to have light emitting diodes of a LED-display arranged on the same side of the circuit board as the circuits, but by moving the circuits to the so-called rear side to be facing away from the window when the display device is arranged behind said window the light emitting diodes may be arranged closer to the circuit board and by that the circuit board closer to the window and the casing may be made thinner.

[0012] According to a preferred embodiment of the invention the information display also comprises a device delivering a voltage suitable for supplying electricity to said light emitting diodes, and said voltage delivering device is arranged outside and remote from the casing containing the display device. By taking the voltage delivering device, which often is a DC/DC-converter, out of the casing containing the display device this may be made even more compact increasing the advantages of the information display according to the invention further. This device may then be arranged in a separate casing secured to the vehicle at any place where it will not cause any disturbances.

[0013] According to another preferred embodiment of the invention the information display further comprises a drive circuit adapted to receive serial data from a terminal arranged in the vicinity of the driver's seat in the vehicle for controlling the state of the display elements, and said

drive circuit is arranged outside and remote from the casing containing the display device. By removing such a drive circuit from the casing containing the display device this may together with its content be made even lighter and thinner resulting in the advantages discussed above.

[0014] It is preferred to arrange the voltage delivering device and the drive circuit in the same separate casing.

[0015] According to another preferred embodiment of the invention the information display comprises at least one elongated safety member, such as a safety wire, secured to the casing containing the display device and adapted to be attached to a frame of the vehicle, such as the ceiling thereof. Such a safety member results in an extra safety would the fastening of the casing containing the display device for any reason break, for example if the window breaks as a consequence of any traffic accident or the like, since the casing will then not fall down and cause any injuries of passengers.

[0016] A method for mounting a display device of an information display behind a window of a public transport vehicle according to the invention is defined in the appended independent method claim. The advantage of securing a casing containing a display device in the form of a LED-display device having light emitting diodes as said display elements to the inside of said window is that an information display having the advantages discussed above is obtained and that the securing step will be easy to carry out, since such a casing with its content will be light and compact and by that easy to handle.

[0017] Further advantages as well as preferred features of the invention will appear from the following description and the other dependent claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] With reference to the appended drawings below follows a specific description of preferred embodiments of the invention cited as examples.

[0019] In the drawings:

Fig 1 is an exploded perspective view schematically illustrating how a casing containing a display device of an information display according to the present invention may be secured to the inside of a vehicle window,

Fig 2 is a vertical cross-section through the casing of the information display shown in fig 1 when secured to said window,

Fig 3 is a schematical view of the display device of the information display according to fig 1 and 2 from the outside of said window, and

Fig 4 is a view corresponding to fig 2 of an information display according to another preferred embodiment of the invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS OF THE INVENTION

[0020] An information display according to a preferred embodiment of the invention will now be explained while making reference simultaneously to fig 1-3. The information display comprises a casing 1, for example of plastic, containing a display device to be described further below and adapted to be secured to the inside 2 of a window 3 of a public transport vehicle, such as a bus, a train, a tram or the like. This window may be a side, front or rear window of the vehicle.

[0021] For obtaining the securing of the casing to the window the information display has a securing means including an adhesive through which two elongated plate-like elements 4, here of aluminium, are secured to the window by glueing. The two elements are secured so that they extend substantially in parallel with each other and at a distance appropriate for the later securing of the casing 1 to these elements. Each element 4 has a plurality of sleeves 5 projecting away from the window and provided with an inner thread arranged therein. The casing 1 has corresponding holes 6, through which securing members in the form of screws 7 may be introduced for engagement through their threaded portions with the thread of the sleeves and being tightened for securing the casing to the elements 4 and by that to the window 3. This construction makes maintenance and repair of components inside the casing easy by only loosening the screws and lifting away the casing with its content.

[0022] Safety members in the form of safety wires 8 are secured to the casing 1 and adapted to be attached to a frame of the vehicle, such as the ceiling thereof, for suspending the casing 1, so that it will not fall down even if the window will break or the securing of the casing to the window will for any reason fail.

[0023] The interior and the content of the casing 1 will now be explained while making reference in particular to fig 2.

[0024] The casing contains a display device 9 being a so-called LED-display device having a plurality of display elements in the form of light emitting diodes 10 forming an information display surface visible from the outside of the window as shown in fig 3 for displaying information by forming signs with adjacent such light emitting diodes when emitting light as illustrated in fig 3. These light emitting diodes are through their legs 24 connected to circuits of a circuit board 11 for enabling control thereof and providing them with electricity. A front plate 12, for example of aluminium, is arranged close to the window and is provided with longitudinal horizontal ribs 13 for protecting the light emitting diodes against the sun and increasing the contrasts of the display surface.

[0025] A voltage delivering device in the form of a DC/DC-converter 14 is arranged in the casing and through a cable 15 connected to the voltage source of the vehicle, normally a 24 Volts battery or the power sup-

ply of the vehicle in the form of a generator. This converter converts the voltage from said voltage source into a voltage of a level suited for the supply of electricity to the light emitting diodes. In the present case this means a conversion of the voltage from 24 V to 3,3 V. This voltage is through a connector 16 supplied to the circuits of the circuit board for the supply of electricity in the form of direct currents to the light emitting diodes. However, any other levels of these voltages are conceivable, e.g. 2 V for light emitting diodes manufactured for that voltage level.

[0026] The casing also contains a drive circuit 17 adapted to receive serial data from a terminal arranged in the vicinity of the drivers seat in the vehicle for controlling the state of the light emitting diodes. 18 indicates a cable including a conductor for such a supply of serial data as well as a conductor connected to the voltage source of the vehicle for supplying a 24 Volt direct voltage to the drive circuit 17. The drive circuit 17 is through a contact member 19 in contact with the circuits of the circuit board for enabling the drive circuit to control the state of the different light emitting diodes by turning them on or off and by that producing information on the display surface of the display device.

[0027] The casing also contains an inner metal box or casing 20 containing the circuit board 11, the converter 14 and the drive circuit 17 for shielding them against outer disturbances.

[0028] When using a LED-display device as display device the distance between the window and the display elements, the light emitting diodes, may be made very short, such as only one or a few millimetres, mostly without any problem under 5 millimetres. In fact, a zero distance would be possible if vibrations of the window are taken care of.

[0029] An information display according to another preferred embodiment of the invention is illustrated in fig 4 and the parts thereof corresponding to parts of the embodiment shown in fig 2 has been provided with the same reference numeral added with an and will now only be described as far as they differs from those in the embodiment according to fig 2.

[0030] The casing 1 in this embodiment is made even thinner and the content thereof even lighter thanks to a number of features. The circuits of the circuit board 11' have been arranged on the opposite side of the circuit board with respect to the light emitting diodes 10', so that the circuit board may be arranged closer to the front panel 12'.

[0031] The DC/DC-converter has been removed from the casing and arranged in a separate casing 21, which may be arranged anywhere in the vehicle, for instance on the frame thereof, and it supplies electricity to the circuit board through a cable 22. Also the drive circuit has been moved out of the casing 1' and is arranged in the casing 21 and control signals therefrom are sent to the circuit board through the contact member 19', which has been made thinner, through a cable 23. All these meas-

ures contribute to a more compact design being lighter and thinner.

[0032] The invention is of course not in any way restricted to the preferred embodiments described above, but many possibilities to modifications thereof would be apparent to a person with ordinary skill in the art without departing from the basic idea of the invention as defined in the appended claims.

[0033] The securing of the casing to the window may be achieved through other means. The elongated elements may for instance be arranged with another orientation, or they may be replaced by a number of smaller elements, for instance arranged in each corner of the casing. It would also be possible to secure such elements by other means than by glueing to the window, for instance by drilling holes through the window and using nuts and screws therefor.

[0034] It is also possible to integrate the DC/DC-converter into the circuit board by suitable circuits for reducing the thickness and weight of the display device.

[0035] Furthermore, the front plate is not always necessary and may be omitted.

[0036] Although not shown in the figures the invention is of course also applicable to windows being more or less curved.

[0037] It is also conceivable to use any other type of device than a DC/DC-converter for delivering a voltage suitable for supplying the light emitting diodes with electricity. In some type of vehicles there may even be an alternating voltage source and said device may then be an AC/DC-converter.

Claims

1. An information display for a public transport vehicle comprising

- a display device (9) to be arranged behind a window (3) of said vehicle and comprising a plurality of display elements (10, 10') forming an information display surface visible from the outside when arranged behind said window,
- a casing (1, 1') containing said display device, and
- means for securing said casing of the information display to the inside of said window with the display elements close to the window, said display device being a LED-display device having light emitting diodes (10, 10') as said display elements,

characterized in that it comprises a circuit board (11), to the circuits of which said light emitting diodes (10, 10') are connected, and that the circuits of said circuit board are arranged on the opposite side of the circuit board with respect to the arrangement of the light emitting diodes.

2. An information display according to claim 1, **characterized in that** it also comprises a device delivering a voltage suitable for supplying electricity to said light emitting diodes (10, 10'), and that said voltage delivering device is integrated directly into a circuit board, to the circuits of which said light emitting diodes are connected.
3. An information display according to claim 1, **characterized in that** it also comprises a device delivering a voltage suitable for supplying electricity to said light emitting diodes (10, 10'), and that said voltage delivering device is arranged outside and remote from the casing (1, 1') containing the display device.
4. An information display according to claim 3, **characterized in that** said voltage delivering device (14) is arranged in a separate casing (21) secured to the vehicle.
5. An information display according to any of claims 2-4, **characterized in that** said voltage delivering device is a DC/DC-converter (14) adapted to convert the voltage from the voltage source of the vehicle into a voltage suitable for supplying electricity to said light emitting diodes (10, 10').
6. An information display according to any of the preceding claims, **characterized in that** it further comprises a drive circuit (17) adapted to receive serial data from a terminal arranged in the vicinity of the drivers seat in the vehicle for controlling the state of the display elements (10, 10'), and that said drive circuit is arranged outside and remote from the casing containing the display device.
7. An information display according to claim 6, **characterized in that** said drive circuit (17) is arranged in a separate casing (21) secured to the vehicle.
8. An information display according to claim 4 and 7, **characterized in that** said voltage delivering device (14) and drive circuit (17) are arranged in the same casing (21).
9. An information display according to any of the preceding claims, **characterized in that** it comprises at least one elongated safety member (8), such as a safety wire, secured to the casing (1, 1') containing the display device and adapted to be attached to a frame of the vehicle, such as the ceiling thereof.
10. An information display according to any of the preceding claims, **characterized in that** said securing means includes elements (4) to be secured to the inside of said window (3) and members (7) for securing said casing (1, 1') containing the display device to the window by securing them to said elements.
11. An information display according to claim 10, **characterized in that** said securing means further includes an adhesive for securing said elements (4) to the inside of said window (3) by glueing.
12. An information display according to claim 10 or 11, **characterized in that** said elements (4) comprises elongated plates to be secured to the inside of said window and having means (5) for establishing a mechanical connection to said securing members (7) for securing said casing (1, 1') thereto.
13. An information display according to any of the claims 10-12; **characterized in that** said securing means includes threaded members (5) arranged on said elements (4), and that said securing members (7) have threaded portions adapted to engage said threaded members (1, 1') for securing said casing to the window.
14. An information display according to claim 13, **characterized in that** said threaded members arranged on said elements (4) are sleeves (5) having an inner thread and the securing members are screws (7).
15. A method for mounting a display device (9) of an information display according to claim 1 behind a window (3) of a public transport vehicle, said display device comprising a plurality of display elements (10, 10') forming an information display surface visible from the outside when arranged behind said window, which comprises a step of securing a casing (1, 1') containing said display device to the inside of a said window with the display elements close to the window.
16. A method according to claim 15, **characterized in that** in the securing step elongated plates (4) are secured to the inside of said window (3) and said casing (1, 1') containing the display device is secured to the window by establishing a mechanical connection between securing members (7) and said elongated plates (4).
17. A method according to claim 16, **characterized in that** said mechanical connection is established by making threaded members (5) of said elongated plates (4) to engage securing members (7) having threaded portions.
18. A method according to any of claims 15-17, **characterized in that** the display device (9) a display device is mounted behind a window of a public transport vehicle.

Patentansprüche

1. Informations-Display für ein Fahrzeug des öffentlichen Personenverkehrs, umfassend
 - eine Display-Einrichtung (9) zur Anordnung hinter einem Fenster (3) des Fahrzeugs, umfassend eine Mehrzahl an Display-Elementen (10, 10'), die eine Informations-Display-Oberfläche bilden, welche, wenn sie hinter dem Fenster angeordnet ist, von Außen sichtbar ist,
 - ein Gehäuse (1, 1'), welches die Display-Einrichtung enthält, und
 - Mittel zur Befestigung des Gehäuses des Informations-Displays an der Innenseite des Fensters, wobei sich die Display-Elemente nahe am Fenster befinden, wobei es sich bei der Display-Einrichtung um eine LED-Display-Einrichtung mit Leuchtdioden (10, 10') als Display-Elementen handelt, **dadurch gekennzeichnet, dass** das Informations-Display eine Leiterplatte (11) umfasst, mit dessen Schaltkreisen die Leuchtdioden (10, 10') verbunden sind, und dass die Schaltkreise der Leiterplatte auf der in Bezug auf die Anordnung der Leuchtdioden gegenüberliegenden Seite der Leiterplatte angeordnet sind.
2. Informations-Display nach Anspruch 1, **dadurch gekennzeichnet, dass** es des Weiteren eine Einrichtung umfasst, die eine Spannung liefert, welche für die Versorgung der Leuchtdioden (10, 10') mit Strom geeignet ist, und dass die Spannung liefernde Einrichtung direkt in eine Leiterplatte, an deren Schaltkreise die Leuchtdioden angeschlossen sind, integriert ist.
3. Informations-Display nach Anspruch 1, **dadurch gekennzeichnet, dass** es des Weiteren eine Einrichtung umfasst, die eine Spannung liefert, welche für die Versorgung der Leuchtdiode (10, 10') mit Strom geeignet ist, und dass die Spannung liefernde Einrichtung außerhalb und entfernt von dem die Display-Einrichtung enthaltenden Gehäuse (1, 1') angeordnet ist.
4. Informations-Display nach Anspruch 3, **dadurch gekennzeichnet, dass** die Spannung liefernde Einrichtung (14) in einem separaten, an dem Fahrzeug befestigten Gehäuse (21) angeordnet ist.
5. Informations-Display nach einem oder mehreren der Ansprüche 2-4, **dadurch gekennzeichnet, dass** es sich bei der Spannung liefernden Einrichtung um einen DC-DC-Wandler (14) handelt, der für die Umwandlung der von der Spannungsquelle des Fahrzeuges angelegten Spannung in eine Spannung ausgestaltet ist, welche für die Versorgung der
- Leuchtdioden (10, 10') mit Strom geeignet ist.
6. Informations-Display nach einem oder mehreren der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** es des Weiteren einen Steuerkreis (17) umfasst, der für den Empfang serieller Daten aus einem in der Nähe des Fahrersitzes im Fahrzeug angeordneten Terminal, zur Steuerung des Status der Display-Elemente (10, 10'), ausgelegt ist, und dass der Steuerkreis außerhalb und fern von dem die Display-Einrichtung enthaltenden Gehäuse angeordnet ist.
7. Informations-Display nach Anspruch 6, **dadurch gekennzeichnet, dass** der Steuerkreis (17) in einem separaten, an dem Fahrzeug befestigten Gehäuse (21) angeordnet ist.
8. Informations-Display nach Ansprüchen 4 und 7, **dadurch gekennzeichnet, dass** die Spannung liefernde Einrichtung (14) und der Steuerkreis (17) in demselben Gehäuse (21) angeordnet sind.
9. Informations-Display nach einem oder mehreren der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** es wenigstens ein längliches Sicherheitselement (8), beispielsweise einen Sicherheitsdraht, umfasst, das an dem die Display-Einrichtung enthaltenden Gehäuse (1, 1') befestigt ist und zur Anbringung an einem Rahmen des Fahrzeugs, wie etwa dessen Decke, ausgestaltet ist.
10. Informations-Display nach einem oder mehreren der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** das Befestigungsmittel Elemente (4) umfasst, die an der Innenseite des Fensters (3) befestigt werden, sowie Mittel (7), die zur Befestigung des die Display-Einrichtung enthaltenden Gehäuses (1, 1') am Fenster dienen, und zwar durch Befestigen der besagten Mittel an den Elementen.
11. Informations-Display nach Anspruch 10, **dadurch gekennzeichnet, dass** das Befestigungsmittel des Weiteren einen Klebstoff, zur Befestigung der Elemente (4) an der Innenseite des Fensters (3) durch Kleben, umfasst.
12. Informations-Display nach Anspruch 10 oder 11, **dadurch gekennzeichnet, dass** die Elemente (4) längliche Platten umfassen, die an der Innenseite des Fensters angebracht werden und Mittel (5) zur Herstellung einer mechanischen Verbindung mit den Befestigungsmitteln (7) aufweisen, um das Gehäuse (1, 1') daran zu befestigen.
13. Informations-Display nach einem oder mehreren der Ansprüche 10 bis 12, **dadurch gekennzeichnet, dass** das Befestigungsmittel Elemente (5) mit Ge-

winde, welche auf den Elementen (4) angeordnet sind, umfasst und dass die Befestigungsmittel (7) Abschnitte mit Gewinde aufweisen, welche für den Eingriff in die ein Gewinde aufweisenden Elemente (5) ausgestaltet sind, um das Gehäuse an dem Fenster zu befestigen.

14. Informations-Display nach Anspruch 13, **dadurch gekennzeichnet, dass** es sich bei den auf den Elementen (4) angeordneten, ein Gewinde aufweisenden Elementen um Hülsen (5) mit einem Innengewinde handelt und dass die Befestigungsmittel Schrauben (7) sind.

15. Verfahren zum Anbringen einer Display-Einrichtung (9) eines Informations-Displays nach Anspruch 1 hinter einem Fenster (3) eines Fahrzeugs des öffentlichen Personenverkehrs, wobei die Display-Einrichtung eine Mehrzahl an Display-Elementen (10, 10') umfasst, die eine Informations-Display-Oberfläche bilden, welche, wenn sie hinter dem Fenster angeordnet ist, von Außen sichtbar ist, wobei das Verfahren einen Schritt der Befestigung eines die Display-Einrichtung enthaltenden Gehäuses (1, 1') an der Innenseite des Fensters umfasst, wobei sich die Display-Elemente in der Nähe des Fensters befinden.

16. Verfahren nach Anspruch 15, **dadurch gekennzeichnet, dass** in dem Befestigungsschritt längliche Platten (4) an der Innenseite des Fensters (3) befestigt werden und dass die Display-Einrichtung enthaltende Gehäuse (1, 1'), durch Herstellen einer mechanischen Verbindung zwischen den Befestigungsmitteln (7) und den länglichen Platten (4), an dem Fenster befestigt wird.

17. Verfahren nach Anspruch 16, **dadurch gekennzeichnet, dass** die mechanische Verbindung hergestellt wird durch Erzeugen eines Eingriffs der ein Gewinde aufweisenden Elemente (5) der länglichen Platten (4) mit den Gewindeabschnitten aufweisenden Befestigungsmitteln (7).

18. Verfahren nach einem oder mehreren der Ansprüche 15-17, **dadurch gekennzeichnet, dass** die Display-Einrichtung (9) hinter einem Fenster eines Fahrzeugs des öffentlichen Personenverkehrs angebracht wird.

Revendications

1. Ecran d'information pour un véhicule de transport public comprenant :

- un dispositif (9) d'affichage à mettre derrière une fenêtre (3) du véhicule et comprenant une pluralité d'éléments (10, 10') d'affichage formant

une surface d'affichage d'informations visible de l'extérieur, lorsqu'elle est mise derrière la fenêtre,

- un boîtier (1, 1') comprenant le dispositif d'affichage, et

- des moyens de fixation du boîtier de l'écran d'information à l'intérieur de la fenêtre, les éléments d'affichage étant près de la fenêtre, le dispositif d'affichage étant un dispositif d'affichage à DEL ayant des diodes (10, 10') électroluminescentes comme éléments d'affichage, **caractérisé en ce qu'il** comprend une plaquette (11) à circuit imprimé, au circuit duquel les diodes (10, 10') électroluminescentes sont reliées, et **en ce que** les circuits de la plaquette à circuit imprimé sont mis sur la face de la plaquette à circuit imprimé opposée à l'agencement des diodes électroluminescentes.

2. Ecran d'information suivant la revendication 1, **caractérisé en ce qu'il** comprend aussi un dispositif appliquant une tension appropriée pour fournir de l'électricité aux diodes (10, 10') électroluminescentes et **en ce que** le dispositif d'application d'une tension est intégré directement dans une plaquette à circuit imprimé, aux circuits de laquelle les diodes électroluminescentes sont reliées.

3. Ecran d'information suivant la revendication 1, **caractérisé en ce qu'il** comprend aussi un dispositif appliquant une tension propre à fournir de l'électricité aux diodes (10, 10') électroluminescentes et **en ce que** le dispositif d'application d'une tension est disposé à l'extérieur et à distance du boîtier (1, 1') contenant le dispositif d'affichage.

4. Ecran d'information suivant la revendication 3, **caractérisé en ce que** le dispositif (14) d'application d'une tension est mis dans un boîtier (21) distinct, fixé au véhicule.

5. Ecran d'information suivant l'une quelconque des revendications 2 à 4, **caractérisé en ce que** le dispositif d'application d'une tension est un convertisseur (14) courant continu/courant continu, conçu pour transformer la tension de la source de tension du véhicule en une tension propre à fournir de l'électricité aux diodes (10, 10') électroluminescentes.

6. Ecran d'information suivant l'une quelconque des revendications précédentes, **caractérisé en ce qu'il** comprend, en outre, un circuit (17) d'attaque conçu pour recevoir des données en séquence d'un terminal disposé à proximité du siège du conducteur dans le véhicule, pour commander l'état des éléments (10, 10') d'affichage, et **en ce que** le circuit d'attaque est mis à l'extérieur et à distance du boîtier contenant le dispositif d'affichage.

7. Ecran d'information suivant la revendication 6, **caractérisé en ce que** le circuit (17) d'attaque est mis dans un boîtier (21) distinct, fixé au véhicule.
8. Ecran d'information suivant les revendications 4 et 7, **caractérisé en ce que** le dispositif (14) d'application d'une tension et le circuit (17) d'attaque sont mis dans le même boîtier (21).
9. Ecran d'information suivant l'une quelconque des revendications précédentes, **caractérisé en ce qu'il** comprend au moins un élément (8) oblong de sécurité, tel qu'un fil de sécurité fixé au boîtier (1, 1') contenant le dispositif d'affichage, et conçu pour être fixé à un bâti du véhicule, tel qu'à son plafond.
10. Ecran d'information suivant l'une quelconque des revendications précédentes, **caractérisé en ce que** les moyens de fixation comprennent des éléments (4) à fixer à l'intérieur de la fenêtre (3) et des membres (7), pour fixer le boîtier (1, 1') contenant le dispositif d'affichage à la fenêtre en les fixant aux éléments.
11. Ecran d'information suivant la revendication 10, **caractérisé en ce que** les moyens de fixation comprennent, en outre, un adhésif pour fixer les éléments (4) à l'intérieur de la fenêtre (3) par collage.
12. Ecran d'information suivant la revendication 10 ou 11, **caractérisé en ce que** les éléments (4) comprennent des plaques oblongues à fixer à l'intérieur de la fenêtre ayant des moyens (5) d'établissement d'une liaison, mécanique avec les membres (7) de fixation pour y fixer le boîtier (1, 1').
13. Ecran d'information suivant l'une quelconque des revendications 10 à 12, **caractérisé en ce que** les moyens de fixation comprennent des membres (5) filetés disposés sur les éléments (4) et **en ce que** les membres (7) de fixation ont des parties filetées conçues pour engrener avec les membres (1, 1') filetés pour fixer le boîtier à la fenêtre.
14. Ecran d'information suivant la revendication 13, **caractérisé en ce que** les membres filetés disposés sur les éléments (4) sont des manchons (5) ayant un taraudage et les membres de fixation sont des vis (7).
15. Procédé de montage d'un dispositif (9) d'affichage d'un écran d'information suivant la revendication 1 derrière une fenêtre (3) d'un véhicule de transport public, le dispositif d'affichage comprenant une pluralité d'éléments (10, 10') d'affichage formant une surface d'affichage d'informations visible de l'extérieur, lorsqu'il est mis derrière la fenêtre, qui comprend un stade de fixation d'un boîtier (1, 1') contenant le dispositif d'affichage à l'intérieur de la fenêtre, alors que les éléments d'affichage sont près de la fenêtre.
16. Procédé suivant la revendication 15, **caractérisé en ce que**, dans le stade de fixation, on fixe des plaques (4) oblongues à l'intérieur de la fenêtre (3) et on fixe le boîtier (1, 1') contenant le dispositif d'affichage à la fenêtre en établissant une liaison mécanique entre des membres (7) de fixation et des plaques (4) oblongues.
17. Procédé suivant la revendication 16, **caractérisé en ce qu'on** établit la liaison mécanique en faisant engrener des membres (5) filetés des plaques (4) oblongues avec des membres (7) de fixation ayant des parties filetées.
18. Procédé suivant l'une quelconque des revendications 15 à 17, **caractérisé en ce qu'on** monte le dispositif (19) d'affichage derrière une fenêtre d'un véhicule de transport public.

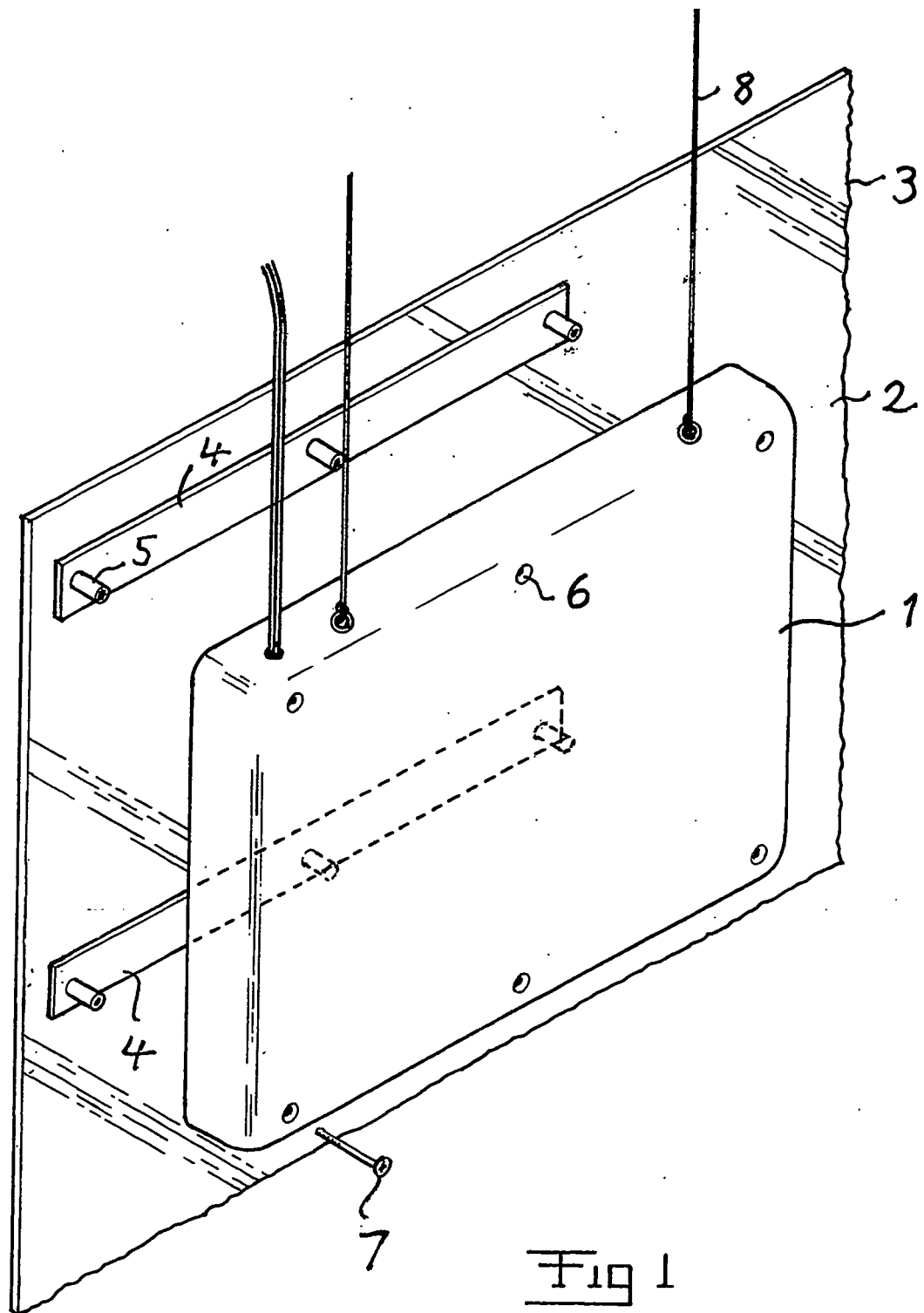
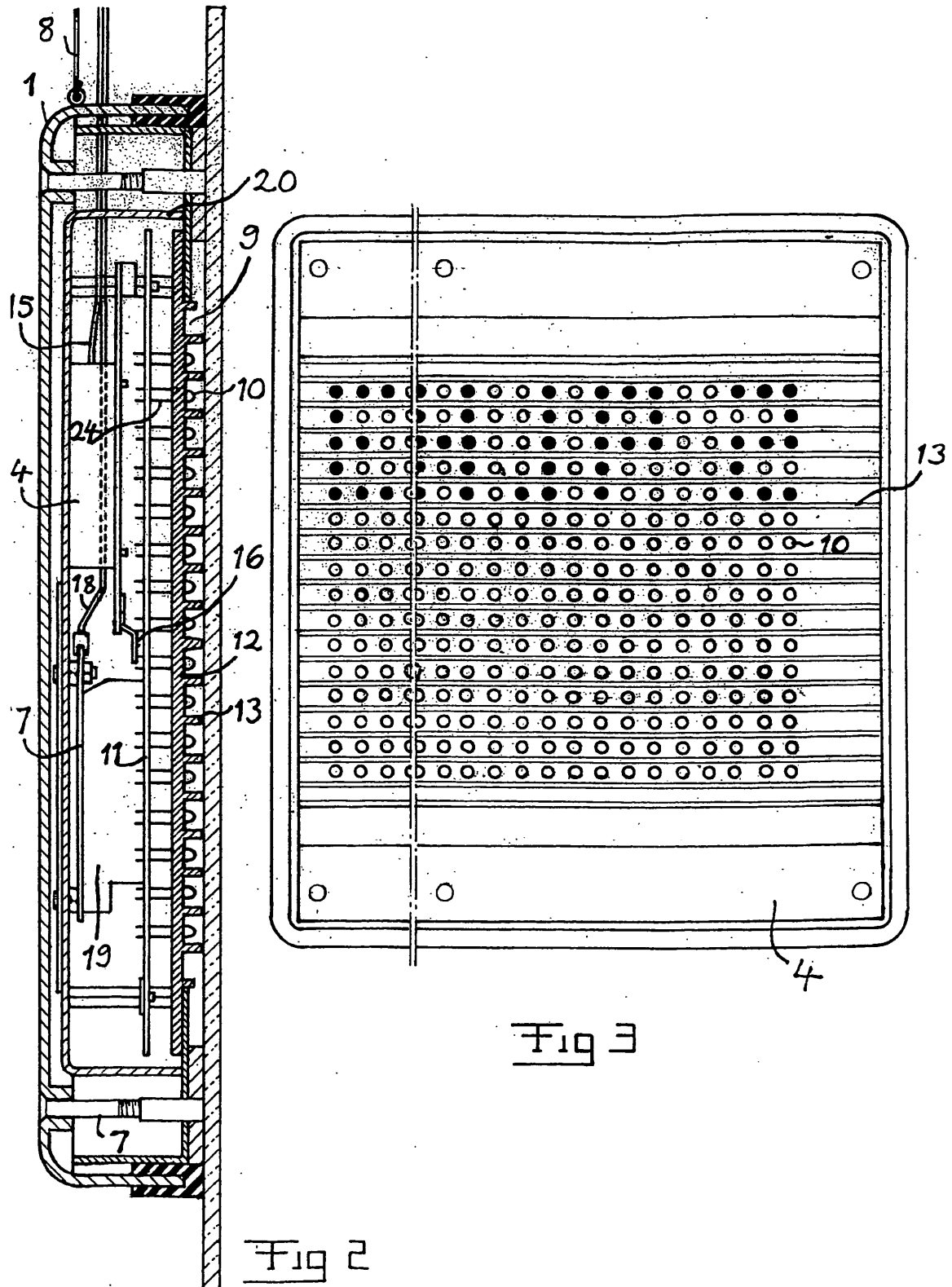


Fig 1



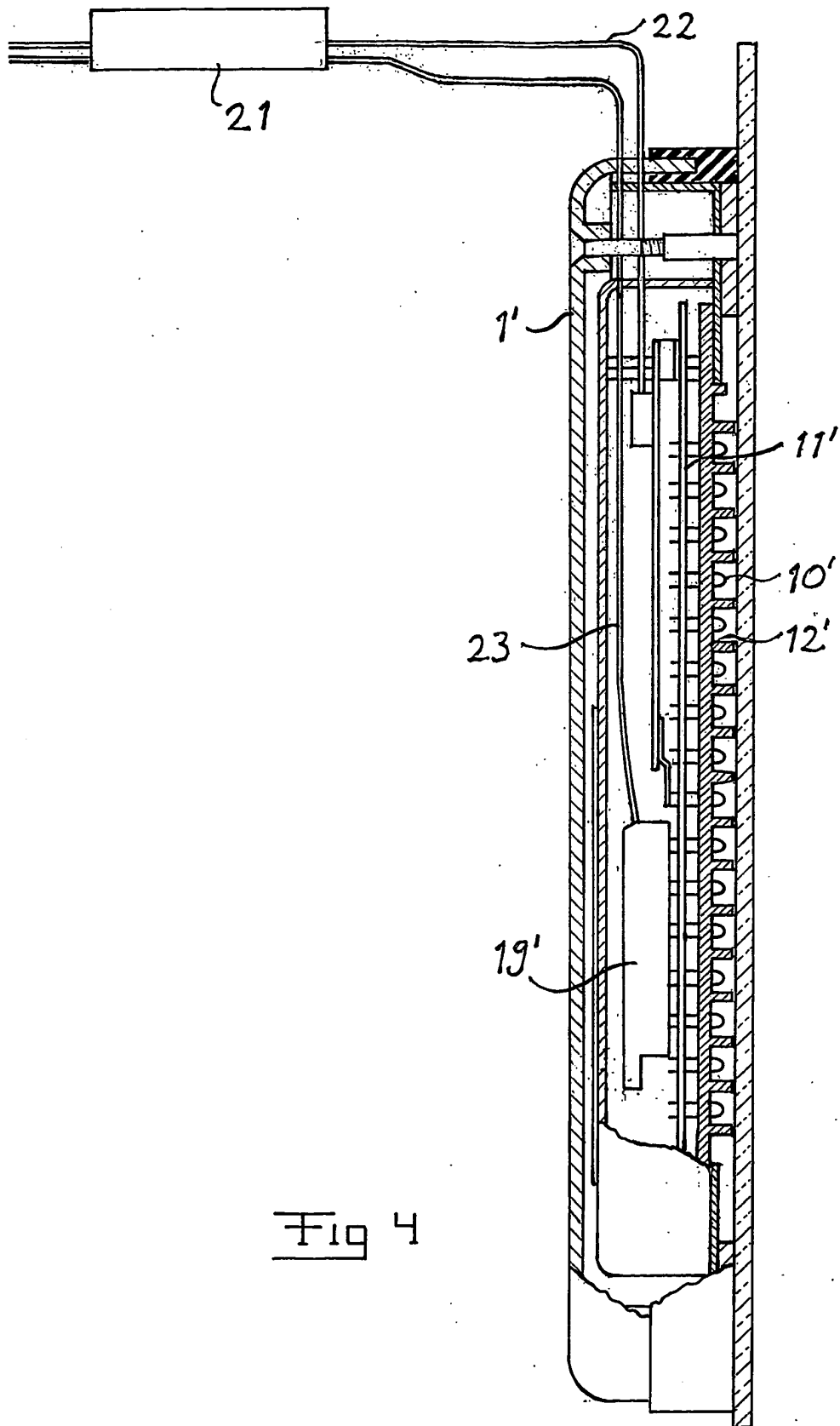


Fig 4

REFERENCES CITED IN THE DESCRIPTION

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