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(54) METHOD AND DEVICE FOR INDICATION OF ARRIVAL TIME

VERFAHREN UND EINRICHTUNG ZUR ANGABE DER ANKUNFTSZEIT

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EP 1 456 828 B1

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DescriptionField of the Invention

- 5 **[0001]** The present invention relates to a device and a method for indicating the expected time to arrival of a vehicle serving on a line in a public transport system at a stop along said line.

Background Art

- 10 **[0002]** In his thesis for a doctorate from 1976 (Stegvis utveckling mot attraktiv kollektivtrafik - Gradual development towards attractive public transport services, Chalmers University of Technology, Sweden), the inventor demonstrated the need for improved information distribution in public transport systems.
- [0003]** The thesis has been the starting point of today's systems for displaying traffic information, such as the KomFram system developed by AB Thoreb. In this system, a display is provided at selected stops showing the relevant public transport lines (buses, trams, etc) and, in connection therewith, two groups of digits indicating the approximate number of minutes remaining until the next departure and the following departure on the relevant lines. The information is transmitted to each stop from a central unit, which continuously keeps track of all vehicles covered by the system.
- 15 **[0004]** Document FR2694116 describes a route indicator panel for use at bus stops which has an illuminated section representing the bus or route, allowing the estimation of waiting time until arrival of next bus.
- 20 **[0005]** This type of displays, which are usually adapted to indicate the line number, the destination and the arrival time by means of electronic signs, is relatively expensive. Moreover, the digits displayed may be hard to distinguish from a long distance, in particular since the display is usually located inside a bus shelter or the like to protect it from the elements. In practice, the passenger must be present at the stop or in the vicinity thereof to be able to read the information.
- [0006]** This means that the passenger is rarely able to reduce the time spent waiting at the stop. For the same reason, the passenger can rarely use the information on stop signs to make a decision on how to finish his or her ongoing activities, since the information simply is not distinguishable from a sufficiently long distance. Should the passenger hurry to catch the first bus, or carry out an additional activity so as to arrive just in time for the next bus?
- 25 **[0007]** Another problem associated with prior art is that, for example, the digit 2 indicates a remaining time to departure of between 100 and 160 seconds. The digit 1 indicates, for example, a remaining time to departure of between 40 and 100 seconds. Thus, using digits is an unsatisfactory way of indicating the estimated time to departure, in particular when the time to departure is short. It is while making their way to a stop that passengers need accurate information the most so as to be able to avoid unnecessary rushing or the risk of being too slow.
- 30 **[0008]** It would be desirable to display traffic information in a different manner to avoid or obviate the above problems.

35 Summary of the Invention

- [0009]** One object of the present invention is therefore to provide a device which is capable of displaying information to passengers in the public transport system in a more efficient way.
- 40 **[0010]** This and other objects are achieved by a device of the kind mentioned by way of introduction, which further comprises a light-emitting unit and a control unit adapted to receive a signal corresponding to the expected remaining time to arrival of the vehicle at the stop and to cause the light-emitting unit, as a function of said signal, to emit a light signal in the vicinity of said indication, which signal varies at a frequency that is dependent on said time, in such manner that a comparatively lower frequency represents a longer time to arrival and a comparatively higher frequency represents a shorter time to arrival.
- 45 **[0011]** By continuously controlling the light-emitting unit causing it to emit a light signal that varies as a function of the expected time to arrival, a clearer connection between the time to arrival and the light signal is obtained than using static indicators such as digits. A further advantage is that, from a long distance, it is much easier to perceive variations in a light signal than a change in a static indication.
- [0012]** The invention is based on the idea that the human brain more readily perceives analogue information or picture information than digital information, for example in the form of two digits indicating the number of minutes remaining to the departure of a certain bus.
- 50 **[0013]** Moreover, the analogue character of the information facilitates an accurate perception and understanding of the information, which is particularly important when the remaining time to arrival is short.
- [0014]** The light-emitting unit may further be technically less advanced than the displays of conventional systems, since it is not required to display a large number of signs and digits. A simpler light-emitting unit is less expensive, and also less sensitive, which allows it to be located in more exposed places, for example high up in lampposts, etc.
- 55 **[0015]** A light-emitting unit according to the invention does not have to be very large for the frequency variations to be perceived from a distance of several hundred meters by a person with normal eyesight.

[0016] The invention makes it easier to provide an indication at a stop which ensures that if only the passenger can see the stop he or she can also appreciate the estimated times of departure from the stop. In an urban environment, it is often possible for the passenger to see a nearby stop. Sometimes, the passenger can see a nearby stop from a home or office window.

[0017] The signal corresponding to the expected remaining time may be generated outside the device, for instance in a central unit, and communicated to the device. In this case, the device may further comprise a communication unit for receiving said signal. Thus, the device may be part of a more comprehensive system adapted to provide passengers with information.

[0018] Alternatively, the device may have means which receive information on the location of a vehicle from the outside and calculate the expected remaining time based on this information. Such means allow the device to operate independently using only an exterior signal, which is received, for example, directly from the vehicle and which indicates the location of said vehicle.

[0019] The signal may of course also contain information regarding the speed of the vehicle, the number of passengers onboard, and/or other factors affecting the expected time required to reach the stop in question.

[0020] The term frequency used in the claims may comprise a number of variants of variable light signals.

[0021] The light-emitting unit may, for example, be adapted to emit a light of varying intensity, in which case frequency means changes in light intensity. An extreme case of intensity variation is the traditional flashing, where the intensity varies between zero and a predetermined value.

[0022] The light-emitting unit may also be adapted to emit light from an area of varying size, in which case frequency means changes in the size of this area. One example would be a cyclic area variation between a large and a small circular disc.

[0023] Furthermore, the light-emitting unit may be adapted to emit light from different areas, in which case frequency means such changes. For example, the light signal may be emitted from a point moving along a predetermined path, such as a circle, at varying speeds. The concept of frequency then basically corresponds to the number of turns of the circular movement.

[0024] Another way of achieving said frequency by varying light-emitting areas is to scroll a lit (or unlit) row across a generally unlit (or lit) light-emitting unit. Scrolling can take place in different directions and at different speeds to indicate different time intervals.

[0025] One advantage of indicating frequency by varying the area emitting light, for example by scrolling an unlit area across a generally lit display, is that the overall light intensity will be constant. For people close to the light-emitting unit this may be less disturbing.

[0026] In addition, the light-emitting unit may be adapted to emit light of a plurality of colours, in which case frequency means the colour switching rate. For instance, a light signal may switch between yellow and red at a varying rate.

[0027] It will be appreciated that other variants of light signal variations than those described above are conceivable and that, advantageously, the variants described can be combined.

[0028] Moreover, the light-emitting unit may be adapted to emit a constant light signal when said expected time to arrival is longer or shorter than a predetermined value. This constant signal may replace the varying signal, so that the frequency-based variation described above is used only when the expected time to arrival is within a predetermined (variable or fixed) time interval. Alternatively, the constant signal may be used in parallel with the varying signal and be emitted, for example, from a separate area of the light-emitting unit.

[0029] According to a preferred embodiment, the light-emitting unit comprises a set of light-emitting diodes forming a panel.

[0030] A second aspect of the invention relates to a method of the kind mentioned by way of introduction, which comprises emitting a light signal in the vicinity of an indication of at least said line of the public transport system, receiving a signal corresponding to the expected remaining time to arrival of the vehicle at the stop, and causing the light signal, as a function of said signal, to vary with a frequency that is dependent on said time, low frequency variations representing a longer time to arrival and high frequency variations representing a shorter time to arrival.

Brief Description of the Drawings

[0031] In the following, currently preferred embodiments of the present invention will be described for exemplifying purposes with reference to the accompanying drawings.

Fig. 1 illustrates a stop sign according to a first embodiment of the invention.

Fig. 2 illustrates a stop sign according to a second embodiment of the invention.

Fig. 3 illustrates a stop sign according to a third embodiment of the invention.

Fig. 4 illustrates a stop sign according to a fourth embodiment of the invention.

Detailed Description of Preferred Embodiments

[0032] Fig. 1 shows a first example of a stop sign device 1 according to the invention. The stop sign device, which may be designed in the manner of conventional signs and made of sheet metal, is provided with the usual bus line indication 8.

[0033] In the example shown, said indication comprises the name of the bus company (KLT), the name of the stop (Solliden), the bus line numbers (103 and 53) and the destinations (Kalmar and Ottenby). All this information may be printed or painted on the sign, but it may also be electronically indicated in per se known manner.

[0034] The stop sign device 1 according to the invention is further provided with at least one light-emitting unit 2 for emitting signals. In the example shown, the light-emitting unit is a panel 2 comprising a plurality of light-emitting diodes of the kind found, for instance, in traffic signals, but preferably of a different shape.

[0035] It should be possible to light up the panel completely or partially and to show several colours. The type of light-emitting diode could be used which emits light of a certain colour if voltage is applied to one of the legs thereof, which emits light of a different colour if voltage is applied to the other leg and which emits light of a third colour if voltage is applied to both legs could be used. The LED technology is likely to undergo further development and new similar technology may also be developed.

[0036] Thus, a light-emitting unit 2 which is arranged on a stop signpost and which has approximately the same size as the panel of a traffic signal will be visible from approximately the same distance as a traffic light. Just as, along a straight road, several traffic lights can be seen at the same time, light-emitting units according to the invention provided at several stops will be visible along such a straight road.

[0037] Furthermore, a stop sign device 1 mounted on a lamppost may be provided with an energy buffer, which supplies energy to the stop sign device when the lamp is not lit. The energy buffer is charged when the lamp is lit.

[0038] The stop sign device 1 further comprises a control unit 3 adapted to control the activity of the light-emitting unit so that a passenger can understand when the next bus serving on, for example, line 103 is expected to depart from the stop.

[0039] The control unit 3 is adapted to receive a signal 4 containing information on the time remaining until the vehicle is expected to arrive at the stop. This information may in turn have been received from the outside by a communication unit located in the stop sign device, for example a per se known radio receiver 5. This means that advantageously the stop sign device may be used in the type of systems in which the estimated arrival times of the vehicles are calculated centrally. Alternatively, these calculations may be communicated directly from an approaching vehicle.

[0040] According to a preferred embodiment, the stop sign device 1 only receives information on the location of the vehicle at a specific moment, and then calculates an expected time to arrival based on this information. The communication unit 5 is here equipped with, or connected to, a unit 6 for processing and storing information, comprising for instance a computer processor and a memory circuit. The memory circuit has been supplied with data on the time required to drive a vehicle along the relevant lines at different times of the day, while the processor has been programmed to calculate the expected remaining time to arrival on the basis of this information. The output signal from this unit 6 is the signal 4 that is received by the control unit.

[0041] Thus, according to this embodiment the stop sign device is capable of operating solely on the basis of a message that may contain information regarding: the location of a certain vehicle, its speed, the number of passengers onboard, etc. Such a message can be transmitted directly from the approaching vehicle. One type of such messages is described in detail in WO01/76105.

[0042] Naturally, it will be appreciated that several of said components (such as the radio receiver, the processor, the memory circuit) may be integrated on a common circuit board if desired.

[0043] It has been found to be particularly advantageous to control the panel causing it to vary the emitted light signal (for example flashing) at a frequency which increases as the expected arrival time approaches. The passenger will learn quickly and will then be able to feel intuitively for example that departure will take place in 10-15 seconds.

[0044] The panel may, for instance, be divided into several segments that can be lit independently of each other and emit light of different colours. This allows the panels to be used in a large number of alternative ways to help the passengers learn intuitively and quickly what different colours in flashing/random/sweeping/rotating combinations mean in terms of the approximate time remaining before the bus arrives.

[0045] For lines that are serviced less frequently, for example in rural areas where the bus departures may be several hours apart, certain combinations may be used, whereas for city lines with 10-minute intervals between departures other combinations are more appropriate. By choosing the appropriate form in combination with the appropriate colours and flash/sweep frequency etc, the skilled person should be able to find embodiments which minimize the risk of mistaking the signals for other signals such as traffic lights.

[0046] According to one example, use is made of a panel with two different fields, one of which is caused to flash at increasing frequency during a predetermined time interval before the arrival. This flash function may then be combined with a fixed light in the other field, optionally of a different colour, which is lit during a predetermined time interval before the flash signal is initiated, and/or after the flash signal, optionally in a third colour, in an interval around the time of

arrival. The idea here is that first a fixed light (for example green) indicates that there is plenty of time before arrival, then a flash signal (for example yellow) indicates a form of countdown within a certain time interval, and finally a new fixed light (for example red) indicates the imminent arrival of the vehicle.

[0047] According to one embodiment, the sign 11 may also be provided with a second, suitably smaller, panel 12 of the same type as the first panel 2, as shown in Fig. 2. The small panel 12 may emit light in a manner that allows a passenger to roughly determine the estimated time of departure from the stop of the bus leaving after the next bus on, say, line 103. If the next bus is the last one of the day on that line, this panel may, for example, emit red light and flash in any appropriate manner so that it is easy for the passenger to realise that the next bus is the last available means of travel that day.

[0048] According to a preferred embodiment, the stop sign device 1 comprises a box with several, suitably four, sides, each side being equipped with a light-emitting unit 2. A box-shaped stop sign 21 of this type is shown in Fig. 3.

[0049] In the case of rural lines, a stop sign device 31 may indicate departure times/direction of lines. A device of this kind may be arranged, for example, high up in the nearest lamppost, while traditional stop signposts are used to indicate the location of the stops on both sides of the road. One embodiment of this kind is shown in Fig. 4.

[0050] In this case, the stop sign device 31 may comprise panels 32 and arrows 33 indicating that, for instance, the upper panel refers to buses leaving in one direction and the lower panel refers to buses leaving in the opposite direction. Optionally, the arrows 33 themselves may be formed by light panels, which can be supplemented by further panels 32 in the way described above.

[0051] A passenger arriving at the stop for the first time will easily remember that, for example, it is the lower panels that indicate the estimated departure of the buses going back home. In the countryside there are few buildings that block the view and combining this with an elevated position of the stop sign device will sometimes allow passengers to distinguish the information from very far away.

[0052] A number of alternative embodiments and designs are possible. For example, alternative techniques for emitting light signals can be used, such as lamps with coloured panels in front or the technology used in exterior display units of buses. Examples of available technology for such units are dot elements, liquid crystals, or so-called segment elements, etc. Other techniques are also conceivable and eventually new technology may be developed that can be used in the application of the invention.

[0053] If the stop sign device at the stop is not visible to the passenger from a window, for example, then inexpensive and simple stop sign devices displaying basically the same information that is displayed at the stop could be put up. These simpler stop sign devices could be arranged in suitable places in the traffic environment. They may be designed as slave units, be smaller in size and bear a supplementary symbol (an arrow or the like) indicating in which direction the stop is located.

[0054] One way of achieving such inexpensive slave units is to provide them with the required information from the stop sign device at the stop by means of any suitable type of short-range radio whose range covers the catchment area of the stop. It is also conceivable to provide portable units that listen to the short-range radio of the nearest stop. This function could be integrated in a mobile phone or in a hand-held computer or a similar unit.

[0055] In the above description, the focus has been primarily on the arrival of a vehicle. It will be appreciated that the invention may just as well be applied to the departure of the vehicle, if this is more relevant in the situation. For example, at some stops the bus may wait a few minutes before continuing its journey. In this case, indicating the time to departure may be more relevant to the passenger than indicating the time to arrival. Normally, it is convenient to indicate the time to departure from the stop and, in normal cases, when the vehicle only stops for a brief period of time at a stop, this time period lies very near the time to arrival time. The term time to arrival is used in this wider meaning in the above description and in the claims.

Claims

1. A device (1) for indicating an expected time to arrival of a vehicle serving on a line in a public transport system at a stop along said line, comprising an indication (8) of at least said line in the public transport system, **characterised by** a light-emitting unit (2) in the vicinity of said indication, and a control unit (3) adapted to receive a signal (4) corresponding to the expected remaining time to arrival of the vehicle at the stop and to cause the light-emitting unit (2), to emit a light signal as a function of said signal (4), wherein the signal varies at a frequency that is dependent on said time in such a manner that a comparatively lower frequency represents a longer time to arrival and a comparatively higher frequency represents a shorter time to arrival.
2. A device according to claim 1, wherein said signal (4) corresponding to the expected remaining time is generated outside the device, and wherein the device further comprises a communication unit (5) for receiving said signal (4).

3. A device according to claim 1, further comprising means (5, 6) for receiving a signal containing information on the location of a vehicle and calculating said expected remaining time based on this information.
4. A device according to claims 1-3, wherein the light-emitting unit (2) is adapted to emit a light of varying intensity.
5. A device according to any one of the preceding claims, wherein the light-emitting unit (2) is adapted to emit light from an area of varying size.
6. A device according to any one of the preceding claims, wherein the light-emitting unit (2) is adapted to emit light from different areas.
7. A device according to any one of the preceding claims, wherein the light-emitting unit (2) is adapted to emit light of a plurality of colours.
8. A device according to any one of the preceding claims, wherein the light-emitting unit (2) is adapted to emit a constant light signal when said time is shorter than a predetermined value.
9. A device according to claims 1-7, wherein the light-emitting unit (2) is adapted to emit a constant light signal when said time is longer than a predetermined value.
10. A device according to any one of the preceding claims, wherein the light-emitting unit (2) comprises a set of light-emitting diodes.
11. A device according to any one of the preceding claims, wherein said indication (8) comprises at least one of the following concepts: the name of the stop, the line number and the destination.
12. A method of indicating an estimated time to arrival of a vehicle serving on a line in a public transport system at a stop along said line, comprising the steps of
emitting a light signal in the vicinity of an indication of at least said line,
receiving a signal corresponding to the expected remaining time to arrival of the vehicle at the stop, and
causing the light signal to vary, as a function of said signal, at a frequency that is dependent on said time,
in such a manner that a comparatively lower frequency represents a longer time to arrival and a comparatively higher frequency represents a shorter time to arrival.
13. A method according to claim 12, further comprising the steps of
receiving a signal containing information on the location of a vehicle, and
calculating said expected remaining time based on this information.
14. A method according to claim 12 or 13, further comprising the step of emitting a constant light signal when said time is shorter than a predetermined value.
15. A method according to claims 12-13, further comprising the step of emitting a constant light signal when said time is longer than a predetermined value.

Patentansprüche

1. , Vorrichtung (1) zur Angabe einer erwarteten Zeit bis zur Ankunft eines eine Linie in einem öffentlichen Verkehrssystem bedienenden Fahrzeugs an einer Haltestelle dieser Linie, eine Angabe (8) zumindest der Linie im öffentlichen Verkehrssystem umfassend und **gekennzeichnet durch**
eine Leuchteinheit (2) in der Nähe der Angabe und
eine Steuereinheit (3), dafür eingerichtet, ein Signal (4) zu empfangen, das der erwarteten verbleibenden Zeit bis zur Ankunft des Fahrzeugs an der Haltestelle entspricht, und die Leuchteinheit (2) zu veranlassen, in Abhängigkeit von dem Signal (4) ein Lichtsignal auszusenden, wobei sich das Signal mit einer Frequenz verändert, das von der Zeit derart abhängt, dass eine vergleichsweise niedrigere Frequenz eine längere Zeit bis zur Ankunft darstellt und eine vergleichsweise höhere Frequenz eine kürzere Zeit bis zur Ankunft darstellt.
2. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** das der erwarteten verbleibenden Zeit entspre-

chende Signal (4) ausserhalb der Vorrichtung erzeugt wird, und **dadurch**, dass die Vorrichtung weiter eine Kommunikationseinheit (5) zum Empfang des Signals (4) umfasst.

3. Vorrichtung nach Anspruch 1, weiter Mittel (5, 6) umfassend, um ein Signal zu empfangen, das Information über den Ort eines Fahrzeugs enthält, und um auf der Grundlage dieser Information die erwartete verbleibende Zeit zu berechnen.

4. Vorrichtung nach Ansprüchen 1 bis 3, **dadurch gekennzeichnet, dass** die Leuchteinheit (2) dafür eingerichtet ist, Licht veränderlicher Intensität auszusenden.

5. Vorrichtung nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die Leuchteinheit (2) dafür eingerichtet ist, Licht von einer Fläche veränderlicher Grösse auszusenden.

6. Vorrichtung nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die Leuchteinheit (2) dafür eingerichtet ist, Licht von verschiedenen Flächenteilen auszusenden.

7. Vorrichtung nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die Leuchteinheit (2) dafür eingerichtet ist, Licht in einer Mehrzahl von Farben auszusenden.

8. Vorrichtung nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die Leuchteinheit (2) dafür eingerichtet ist, ein konstantes Lichtsignal auszusenden, wenn die Zeit kürzer als ein im Voraus festgelegter Wert ist.

9. Vorrichtung nach Ansprüchen 1 bis 7, **dadurch gekennzeichnet, dass** die Leuchteinheit (2) dafür eingerichtet ist, ein konstantes Lichtsignal auszusenden, wenn die Zeit länger als ein im Voraus festgelegter Wert ist.

10. Vorrichtung nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die Leuchteinheit (2) einen Satz von Leuchtdioden umfasst.

11. Vorrichtung nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die Angabe (8) zumindest eines der folgenden Konzepte umfasst: den Namen der Haltestelle, die Nummer der Linie und das Fahrziel.

12. Verfahren zur Angabe einer erwarteten Zeit bis zur Ankunft eines eine Linie in einem öffentlichen Verkehrssystem bedienenden Fahrzeugs an einer Haltestelle dieser Linie, die Schritte umfassend:

Aussendung eines Lichtsignals in der Nähe einer Angabe der zumindest einer Linie,
Empfang eines Signals, das der erwarteten verbleibenden Zeit bis zur Ankunft des Fahrzeugs an der Haltestelle entspricht, und
Veranlassung des Lichtsignals, in Abhängigkeit von dem Signal mit einer Frequenz zu variieren, die von der Zeit abhängt,
derart, dass eine vergleichsweise niedrigere Frequenz eine längere Zeit bis zur Ankunft darstellt und eine vergleichsweise höhere Frequenz eine kürzere Zeit bis zur Ankunft darstellt.

13. Verfahren nach Anspruch 12, weiter die Schritte umfassend:

Empfang eines Signals, das Information über den Ort des Fahrzeugs enthält, und
Berechnung der erwarteten verbleibenden Zeit auf der Grundlage dieser Information.

14. Verfahren nach Anspruch 12 oder 13, weiter den Schritt umfassend, ein konstantes Lichtsignal auszusenden, wenn die Zeit kürzer als ein im Voraus festgelegter Wert ist.

15. Verfahren nach Ansprüchen 12 bis 13, weiter den Schritt umfassend, ein konstantes Lichtsignal auszusenden, wenn die Zeit länger als ein im Voraus festgelegter Wert ist.

Revendications

1. Dispositif (1) d'indication du délai d'arrivée prévu d'un véhicule desservant une ligne d'un système de transport

public à un arrêt de cette ligne, comprenant une indication (8) d'au moins ladite ligne dans le système de transport public, **caractérisé par**

une unité (2) d'émission de lumière dans le voisinage de ladite indication, et

une unité (3) de commande adaptée à recevoir un signal (4) correspondant au délai d'arrivée restant prévu du véhicule à l'arrêt et à faire émettre par l'unité (2) d'émission de lumière un signal lumineux en fonction dudit signal (4), dans lequel le signal varie à une fréquence qui dépend dudit délai,

d'une manière telle qu'une fréquence comparativement plus faible représente un délai d'arrivée plus long et qu'une fréquence comparativement plus élevée représente un délai d'arrivée plus court.

2. Dispositif selon la revendication 1, dans lequel ledit signal (4) correspondant au délai restant prévu est généré à l'extérieur du dispositif, et dans lequel le dispositif comprend en outre une unité (5) de communication destinée à recevoir ledit signal (4).

3. Dispositif selon la revendication 1, comprenant en outre des moyens (5, 6) destinés à recevoir un signal contenant une information sur la position d'un véhicule et à calculer ledit délai restant prévu en se basant sur cette information.

4. Dispositif selon les revendications 1 à 3, dans lequel l'unité (2) d'émission de lumière est adaptée à émettre une lumière d'intensité variable.

5. Dispositif selon l'une quelconque des revendications précédentes, dans lequel l'unité (2) d'émission de lumière est adaptée à émettre de la lumière à partir d'une zone de taille variable.

6. Dispositif selon l'une quelconque des revendications précédentes, dans lequel l'unité (2) d'émission de lumière est adaptée à émettre de la lumière à partir de différentes zones.

7. Dispositif selon l'une quelconque des revendications précédentes, dans lequel l'unité (2) d'émission de lumière est adaptée à émettre de la lumière d'une pluralité de couleurs.

8. Dispositif selon l'une quelconque des revendications précédentes, dans lequel l'unité (2) d'émission de lumière est adaptée à émettre un signal lumineux constant quand ledit délai est plus court qu'une valeur prédéterminée.

9. Dispositif selon les revendications 1-7, dans lequel l'unité (2) d'émission de lumière est adaptée à émettre un signal lumineux constant quand ledit délai est plus court qu'une valeur prédéterminée.

10. Dispositif selon l'une quelconque des revendications précédentes, dans lequel l'unité (2) d'émission de lumière comprend un ensemble de diodes électroluminescentes.

11. Dispositif selon l'une quelconque des revendications précédentes, dans lequel ladite indication (8) comprend au moins l'un des concepts suivants : le nom de l'arrêt, le numéro de la ligne et la destination.

12. Procédé d'indication du délai d'arrivée estimé d'un véhicule desservant une ligne d'un système de transport public à un arrêt de cette ligne, comprenant une indication (8) d'au moins ladite ligne dans le système de transport public, comprenant les étapes consistant à

émettre un signal lumineux dans le voisinage d'une indication d'au moins ladite ligne,

recevoir un signal correspondant au délai d'arrivée restant prévu du véhicule à l'arrêt, et

faire varier le signal lumineux, en fonction dudit signal, à une fréquence qui dépend dudit délai,

d'une manière telle qu'une fréquence comparativement plus faible représente un délai d'arrivée plus long et qu'une fréquence comparativement plus élevée représente un délai d'arrivée plus court.

13. Procédé selon la revendication 12, comprenant en outre les étapes consistant à recevoir un signal contenant une information sur la position d'un véhicule, et calculer ledit délai restant prévu en se basant sur cette information.

14. Procédé selon la revendication 12 ou 13, comprenant en outre l'étape consistant à émettre un signal lumineux constant quand ledit délai est plus court qu'une valeur prédéterminée.

15. Procédé selon les revendications 12 et 13, comprenant en outre l'étape consistant à émettre un signal lumineux constant quand ledit délai est plus long qu'une valeur prédéterminée.

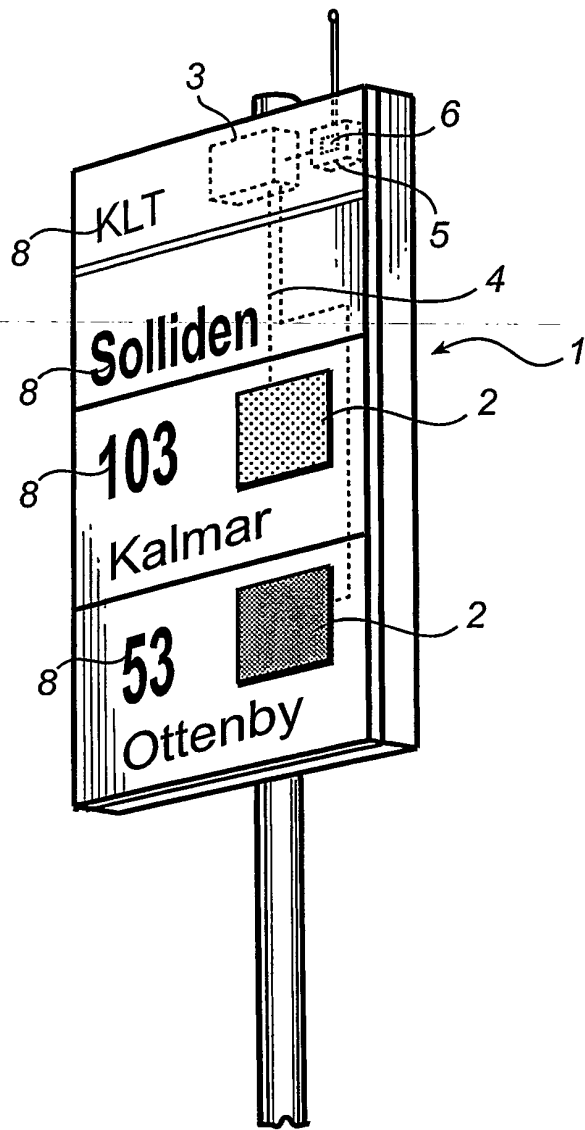


Fig. 1

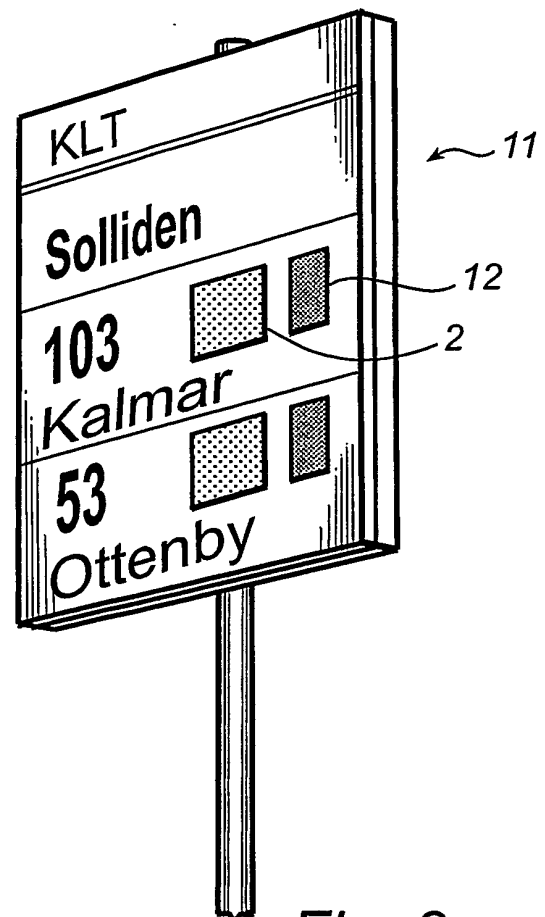


Fig. 2

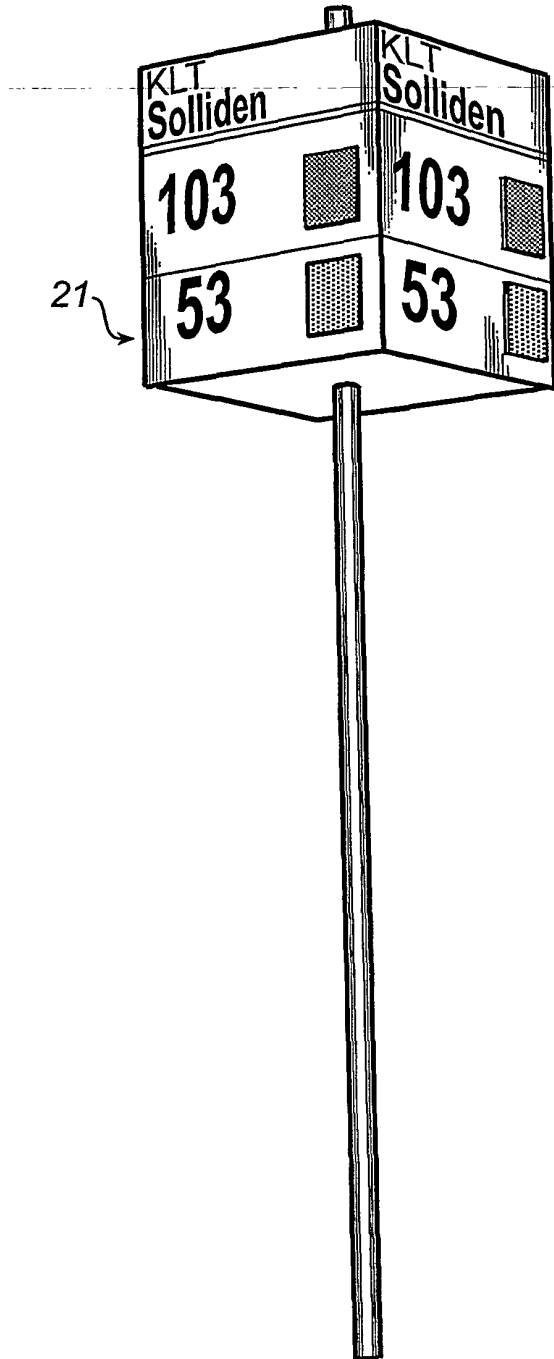


Fig. 3

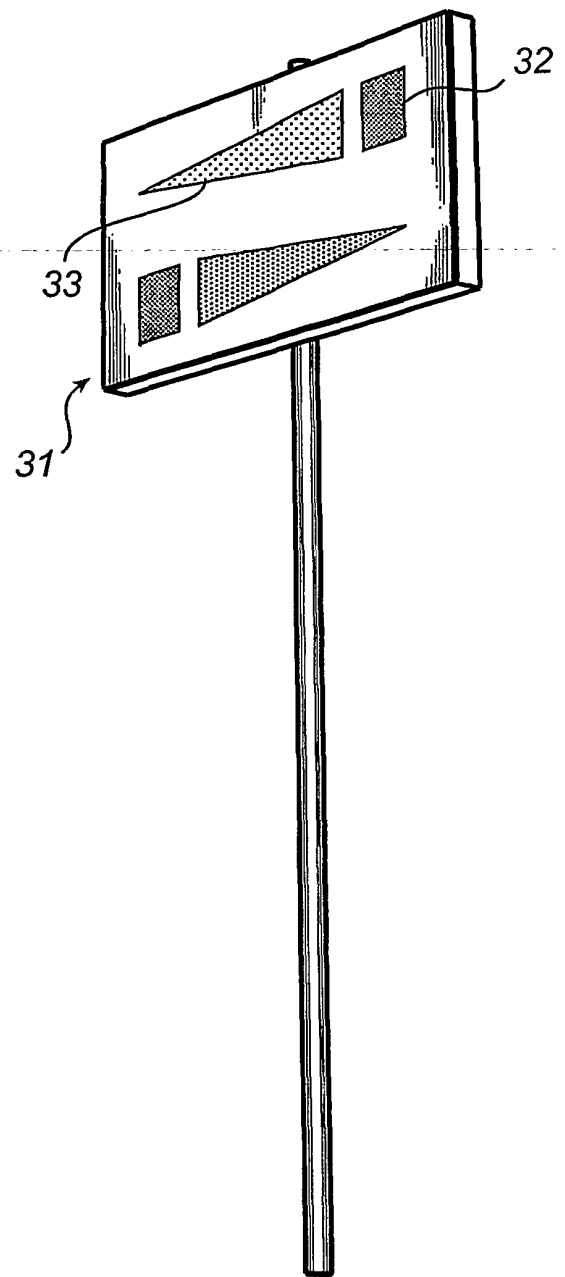


Fig. 4