(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 596 579 B1

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
05.02.1997 Bulletin 1997/06

(51) Int Cl.[6]: **G07B 15/00**, G07F 7/00

(21) Application number: **93203096.8**

(22) Date of filing: **04.11.1993**

(54) Public transport system

Öffentliches Verkehrssystem

Système de transport en commun

(84) Designated Contracting States:
BE DE FR GB IT NL

(30) Priority: **04.11.1992 NL 9201924**

(43) Date of publication of application:
11.05.1994 Bulletin 1994/19

(73) Proprietor: **N.V. Nederlandsche Apparatenfabriek NEDAP**
NL-7141 DE Groenlo (NL)

(72) Inventor: **Hogen Esch, Johannes Harm Lukas**
NL-7122 ZN Aalten (NL)

(74) Representative:
Smulders, Theodorus A.H.J., Ir. et al
Vereenigde Octrooibureaux
Nieuwe Parklaan 97
2587 BN 's-Gravenhage (NL)

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Printed by Jouve, 75001 PARIS (FR)

Description

The invention relates to a public transport system and method, comprising means of transport accessible to the public at a charge, said means in operation travelling predetermined routes operated by one or more operators, with predetermined stops; and sales locations for transport tickets, wherein at least a plurality of passengers are provided with a registration means comprising readable and writable memory means.

Such a system is known from EP-A-0,380,377. In this known system the parameters to register the routes travelled by a passenger are based on the points wherein the passenger started and ended his trip respectfully. More specifically, the number of trips per period, the total number of trips, the number of routes per period and the total number of routes are registered. This implies, that an exact registration of the transport possibilities that have actually been used, has not been realized.

In public transport systems it is important that the participating transport companies (operators) can have the disposal of information about the travel behaviour of passengers, because by means of this information, the transport services rendered by the different operators can be measured. On the basis of the transport service rendered, the proceeds of a transport ticket can then be settled between the companies that have rendered a service for account of this transport ticket.

A service in this sense may for instance be the sale of the transport ticket in question, or taking care of the transport or a part of the transport on the route and/or for the period for which the ticket in question is valid.

In order that this settlement can take place in an accurate manner, it is necessary to register the means of transport, for instance train, bus, underground or taxi, the relevant companies or institutions, and the portion of the total journey travelled for account of a specific type of transport ticket. For this purpose, therefore, preferably, the get-on point, the get-off point, the company as well as the time of getting on and off and, if applicable, transferring, should be registered.

In the current public transport systems, this registration only takes place to a very incomplete extent, if at all. Particularly when a transport ticket allows transport over different routes and/or by different means of transport, and/or if a season ticket for a predetermined period is involved, an exact registration of the transport possibilities that have actually been used is very difficult to realize. Settlement between the various companies usually takes place on the basis of sales information and a random check for a relatively short period and hence is not likely to be very representative of the total annual transport services rendered. The problem of "dodge faring", too, may give rise to a considerable difference between the transport services rendered and the payment to be received by the transport company for such registered transport service.

Further, apart from the registration problem and the resulting problem of the settlement between the various operators, the use of season tickets, in particular of long-term season tickets, has the drawback that the passenger must decide in advance whether he/she will make frequent use of the public transport for a future period which is sometimes long. Moreover, in that case, the passenger must also pay the amount for the season ticket, which is often considerable, in advance, while at that moment it is not certain whether the eventual, actual use of the public transport system does in fact justify the costs of such season ticket.

Because the registration of both the get-on point, the transfer point, if any, and the get-off point will be regarded by the travelling public as rather inconvenient and burdensome, it is important that the public transport system be designed such that registration also has attractive sides to the passenger but need not be made compulsory.

The object of the present invention is to provide at least a partial solution to these problems.

According to the invention the foregoing object is realized by providing a method for operating a public transport system, and, a public transport system comprising means of transport accessible to the public at a charge, which means of transport travel, in operation, predetermined routes operated by one or more operators, with predetermined stops; and sales locations for transport tickets, is characterized in that a least a number of passengers are provided with a registration means comprising readable and writable memory means; that devices are provided by means of which a passenger can write the distance travelled by the passenger in the memory means of a registration means presented by the passenger, while this distance is added in the memory means to a previously registered distance, if any; and that the sales locations are provided with means for reading the total distance registered in the memory means of a registration means and for determining, on the basis of the total distance, the selling price of, and/or the reduction on, a next transport ticket.

It is observed that a public transport system which is so designed that each passenger is both checked in at the beginning of the journey and checked out at the end thereof, is disclosed in EP-A-0 465 456. However, in this known public transport system, no registration means are used that are carried by the passengers themselves and in which the travelled distance can be registered each time. Further, the known public transport system comprises a dense network of communication connections between the means of transport, which are provided with primary registration means, collecting centres and a central processing system. Such a dense communication network is difficult to install, susceptible to failure and at any rate quite costly.

The invention will be explained in more detail hereinafter.

The starting point is that the new public transport system, and in particular the tariff system used, should

be made attractive to the user, i.e. the passenger. The information desired by the transport companies for business efficiency and for logistic purposes must result from this without frequent registration being made compulsory.

In a public transport system according to the invention, registration of the transport service enjoyed, in the form of travelled kilometers, rendered by one or several public transport companies, is promoted by a reduction mechanism according to which more reduction is given according as more kilometers have been travelled. This reduction includes every form of public transport used, for which the passenger himself has registered the starting point, the transfer point(s), if any, and the end point. Possibly, if the route is known in advance, it could suffice to register the starting point alone.

In this connection, the total amount of kilometers travelled by a passenger is for instance added in the registration means and stored in a memory per period of time, for instance per week or per month. Accordingly, on the basis of the travelled distance, for instance in the form of the progressive average of the amount of travelled kilometers per period, a reduction to be given can be calculated when a next transport ticket is sold. Hence, preferably, registration of the travelled distance also includes registration of time information (for instance date, hour, minute, second). In order for the amount of travelled kilometers to be included in the basis of reduction, it is possible to book out within a specific period after the journey has ended, or the distance or the number of zones to be travelled should be stated in advance or be known by the type of transport ticket. Hence, season ticket holders who travel incidentally will have to pay more, relatively speaking, because fewer travelled kilometers are collected and the basis of reduction will therefore be lower. This is not without reason, because non-used transport capacity must be kept available for this group.

For registration, book-off and registration units can be used, which may for instance be located on platforms, in trains, buses and trams and at the entrances and exits of the underground. Registration need not be compulsory for season ticket holders, but it does afford the passenger a reduction when a next or supplementary travel pass is bought. Consequently, the passenger will generally like to register as much as possible to thereby obtain a higher basis of reduction.

In order to promote booking out in the case of zone/km tickets as well, when the number of zones is stated during booking, it is possible to book the minimum distance in kilometers valid for this number of zones for the basis of reduction. However, if booking out takes place as well, the actual transport service in kilometers can be booked for the basis of reduction, which is normally more than the travelling distance determined on the basis of the zones booked. However, in this case the tariff must not be adapted, as this would encourage premature booking out, and hence fraud. When booking out does take place, in the event where too few zones have been booked, correction does take place. In the case of booking without statement of the number of zones to be travelled, it is also possible to book off the maximum number of zones that are still possible on the line in question, after which the amount to be paid as well as the travelled distance are corrected during booking out.

In order to avoid the allocation problem as much as possible, it is advantageous to use route season tickets, while the distribution code for the distribution of monies between the transport companies can be predetermined at the sale, independently of the travelling frequency, and can optionally be corrected with the measured number of fare dodgers. Measuring the number of fare dodgers can for instance be carried out by using counting steps or other detection means with which the total number of passengers getting on and off is counted, and comparing the outcome of this count with the number of bookings or registrations that have taken place.

Underground lines could be closed off entirely, so that when they are entered and left, it automatically becomes possible for the passenger to check in and check out.

Preferably, network season tickets are replaced as much as possible by transport tickets for fixed routes or transport tickets for shorter distances, while eventually, due to a constantly increasing reduction when more kilometers are travelled, prices are paid that do not exceed the current prices for transport on the network. Consequently, the reduction scale should be thus progressive that the passenger never pays more than the price of a network year ticket.

For registering the travelled kilometers for instance a contactless smart card may be used, as described, for instance, in applicant's European patent application 0 534 559.

Such card, or generally the registration means, may also form the transport ticket itself, as described for instance in German Offenlegungsschrift 3 911 667 (Bosch), but it is also possible to use the registration means for registration only and, in addition, to use separate tickets for single use. The registration means can be provided with a unique identification code, uniquely coupled to the holder. The registration means can have a value which can be increased through payment of an amount of money, or can be designed as a conventional credit card or cheque card.

Accordingly, the sales locations may be provided with corresponding pay and/or value-increase machines.

The registration means and, optionally, the transport ticket, may be a chip card with contacts according to the standard ISO 7816, or, conversely, may be a contactless responder card. The advantage of a contactless responder card is that the contactless registration possibility enables very quick registration and that because of the lack of moving elements in the reading devices and writing devices, the maintenance costs are much

lower. A combination of the two designs is also possible, whereby the issue and, optionally, value-increasing could be effected via contacts, while the registration, together with the booking of the travelled distance, could be effected in a contactless manner. Obviously, it is also possible to use a magnetic card, or a registration means comprising other types of memory means. By decentralized registration of the number of travelled kilometers per transport ticket in the registration means or transport ticket in this manner, this information is directly available at all times and no communication with a central computer system is required.

As a result, a greater privacy of the passenger can be guaranteed as well.

Claims

1. A public transport system comprising means of transport accessible to the public at a charge, said means in operation travelling predetermined routes operated by one or more operators, with predetermined stops; and sales locations for transport tickets, wherein at least a plurality of passengers are provided with a registration means comprising readable and writable memory means,

   characterized in that, devices are provided by means of which a passenger can write the distance travelled by the passenger in the memory means of a registration means presented by the passenger, said distance being added in the memory means to a previously registered distance, if any; and

   that the sales locations are provided with means for reading the total distance registered in the memory means of a registration means, and for determining, on the basis of the total distance, the selling price of, and/or the reduction on, a next transport ticket.

2. A public transport system according to claim 1, characterized in that the registration means has the form of a card and that the memory means can be read and written electronically and/or magnetically.

3. A public transport system according to claim 1 or 2, characterized in that the registration means consists of a chip card.

4. A public transport system according to claim 3, characterized in that the chip card is a contactless chip card.

5. A public transport system according to claim 3 or 4, characterized in that the chip card is provided with contacts according to the standard ISO 7816.

6. A public transport system according to any one of the preceding claims, characterized in that the registration means is provided with means for determining from the registered distances a progressive average per predetermined period of time and storing said progressive average in the memory means.

7. A public transport system according to any one of the preceding claims, characterized in that the registration means is provided with a unique code associated with the holder.

8. A public transport system according to any one of the preceding claims, characterized in that the registration means also forms the transport ticket.

9. A public transport system according to any one of the preceding claims, characterized in that the registration means has a money value which can be increased through payment of an amount of money.

10. A public transport system according to any one of the preceding claims, characterized in that the registration means is also designed as a conventional credit card.

11. A public transport system according to any one of the preceding claims, characterized in that the devices for writing travelled distances in the memory means of a registration means comprise check-out means located at the get-off points of the public transport system.

12. A public transport system according to any one of the preceding claims, characterized in that the devices for writing travelled distances in the memory means of a registration means also write time information in the memory means.

13. A public transport system according to any one of the preceding claims, characterized by detection means for counting the number of passengers getting on and off.

14. A method for operating a public transport system with one or more operators, wherein at least a plurality of passengers are provided with a registration means comprising readable and writable memory means, characterized in that devices are provided by means of which a passenger can write the distance travelled with the public transport system in the memory means of his registration means, and that at the sales locations of transport tickets, the total travelled distance registered in the memory means of a registration means presented by the passenger is read and used for determining the selling price of, and/or the reduction on, a next transport ticket.

15. A method according to claim 14, characterized in

that the travelled distance is determined per period of time and that on the basis thereof the selling price of, and/or the reduction on, a next transport ticket are determined.

Patentansprüche

1. Öffentliches Verkehrssystem, mit einem Transportmittel, das für die Öffentlichkeit gegen Bezahlung zugänglich ist, wobei das Transportmittel bei Betrieb vorbestimmte, von einem oder mehreren Betreibern betriebene Routen mit vorbestimmten Haltestellen abfährt; und mit Verkaufsstellen für Fahrscheine, an denen mindestens an mehrere Fahrgäste eine Registriereinrichtung ausgehändigt wird, die eine lesbare und beschreibbare Speichereinrichtung aufweist,
dadurch gekenzeichnet,

   daß Einrichtungen vorgesehen sind, mit denen ein Fahrgast die von ihm zurückgelegte Distanz in die Speichereinrichtung einer von dem Fahrgast präsentierten Registriereinrichtung schreiben kann, wobei in der Speichereinrichtung diese Distanz einer zuvor registrierten Distanz hinzuaddiert wird, falls eine zuvor registrierte Distanz vorhanden ist; und

   daß die Verkaufsstellen mit Einrichtungen versehen sind, die die in der Speichereinrichtung einer Registriereinrichtung registrierte Gesamt-Distanz lesen und auf der Basis der Gesamt-Distanz den Verkaufspreis des nächsten Fahrscheines und/oder die auf diesen zu gewährende Ermäßigung bestimmen.

2. Öffentliches Verkehrssystem nach Anspruch 1, dadurch gekennzeichnet, daß die Registriereinrichtung in Form einer Karte ausgebildet ist und daß die Speichereinrichtung elektronisch und/oder magnetisch gelesen und beschrieben werden kann.

3. Öffentliches Verkehrssystem nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß die Registriereinrichtung aus einer Chip-Karte besteht.

4. Öffentliches Verkehrssystem nach Anspruch 3, dadurch gekennzeichnet, daß die Chip-Karte eine berührungslose Chip-Karte ist.

5. Öffentliches Verkehrssystem nach Anspruch 3 oder 4, dadurch gekennzeichnet, daß die Chip-Karte mit Kontakten gemäß der Norm ISO 7816 versehen ist.

6. Öffentliches Verkehrssystem nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die Registriereinrichtung mit einer Einrichtung versehen ist, die aus den registrierten Distanzen einen progressiven Mittelwert pro vorbestimmte Zeitperiode bestimmt und den progressiven Mittelwert in der Speichereinrichtung speichert.

7. Öffentliches Verkehrssystem nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die Registriereinrichtung mit einem dem Besitzer zugewiesenen unverwechselbaren Kode versehen ist.

8. Öffentliches Verkehrssystem nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die Registriereinrichtung ferner den Fahrschein bildet.

9. Öffentliches Verkehrssystem nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die Registriereinrichtung einen Geldwert aufweist, der durch Zahlung eines Geldbetrages erhöht werden kann.

10. Öffentliches Verkehrssystem nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die Registriereinrichtung ferner als herkömmliche Kreditkarte ausgebildet ist.

11. Öffentliches Verkehrssystem nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die Einrichtungen, die zum Schreiben der zurückgelegten Distanzen in die Speichereinrichtung einer Registriereinrichtung vorgesehen sind, Check-out-Einrichtungen aufweisen, die an den Austrittspunkten des öffentliches Verkehrssystems angeordnet sind.

12. Öffentliches Verkehrssystem nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die Einrichtungen, die zum Schreiben der zurückgelegten Distanzen in die Speichereinrichtung einer Registriereinrichtung vorgesehen sind, auch Zeitinformation in die Speichereinrichtung schreiben.

13. Öffentliches Verkehrssystem nach einem der vorhergehenden Ansprüche, gekennzeichnet durch Detektionseinrichtungen zum Zählen der Anzahl der in das Verkehrssystem eintretenden und dieses verlassenden Fahrgäste.

14. Verfahren zum Betreiben eines öffentlichen Verkehrssystems mit einem oder mehreren Betreibern, bei dem mindestens an mehrere Fahrgäste eine Registriereinrichtung ausgehändigt wird, die eine lesbare und beschreibbare Speichereinrichtung aufweist, dadurch gekennzeichnet, daß Einrichtungen vorgesehen sind, mit denen ein Fahrgast die mit dem öffentlichen Verkehrssystem zurückgeleg-

te Distanz in die Speichereinrichtung seiner Registriereinrichtung schreiben kann, und daß an den Verkaufsstellen der Fahrscheine die gesamte zurückgelegte Distanz, die in der Speichereinrichtung einer von dem Fahrgast präsentierten Registriereinrichtung registriert ist, gelesen wird und zur Bestimmung des Verkaufspreises des nächsten Fahrscheines und/oder der auf diesen zu gewährende Ermäßigung verwendet wird.

15. Verfahren nach Anspruch 14, dadurch gekennzeichnet, daß die zurückgelegte Distanz pro Zeitperiode bestimmt wird und auf der Basis dieser Distanz der Verkaufspreis des nächsten Fahrscheines und/oder die auf diesen zu gewährende Ermäßigung bestimmt werden.

Revendications

1. Système de transport en commun comprenant un moyen de transport accessible au public moyennant paiement, ledit moyen, pendant le fonctionnement, se déplaçant suivant des routes prédéterminées commandées par un ou plusieurs opérateurs, avec des arrêts prédéterminés; et des emplacements de vente pour des titres de transport, dans lesquels un moyen d'enregistrement comprenant un moyen de mémorisation pouvant être lu ou écrit est fourni à au moins plusieurs passagers,

caractérisé en ce que des dispositifs sont prévus, au moyen desquels un passager peut inscrire dans le moyen de mémorisation d'un moyen d'enregistrement présenté par le passager la distance qu'il a parcourue, ladite distance étant ajoutée dans le moyen de mémorisation à une distance qui a été éventuellement enregistrée antérieurement, et

que les points de vente sont pourvus d'un moyen destiné à lire la distance totale enregistrée dans le moyen de mémorisation d'un moyen d'enregistrement et à déterminer, en se basant sur la distance totale, le prix de vente d'un titre de transport suivant, et/ou la réduction à effectuer sur ce titre de transport.

2. Système de transport en commun selon la revendication 1, caractérisé en ce que le moyen d'enregistrement a la forme d'une carte et que le moyen de mémorisation peut être lu et écrit électroniquement et/ou magnétiquement.

3. Système de transport en commun selon la revendication 1 ou 2, caractérisé en ce que le moyen d'enregistrement consiste en une carte à puce.

4. Système de transport en commun selon la revendication 3, caractérisé en ce que la carte à puce est une carte à puce sans contacts.

5. Système de transport en commun selon la revendication 3 ou 4, caractérisé en ce que la carte à puce est pourvue de contacts selon la norme ISO 7816.

6. Système de transport en commun selon l'une quelconque des revendications précédentes, caractérisé en ce que le moyen d'enregistrement est pourvu d'un moyen destiné à déterminer, à partir des distances enregistrées, une moyenne progressive par période prédéterminée de temps et à mémoriser ladite moyenne progressive dans le moyen de mémorisation.

7. Système de transport en commun selon l'une quelconque des revendications précédentes, caractérisé en ce que le moyen d'enregistrement est pourvu d'un code unique associé au support.

8. Système de transport en commun selon l'une quelconque des revendications précédentes, caractérisé en ce que le moyen d'enregistrement forme aussi le titre de transport.

9. Système de transport en commun selon l'une quelconque des revendications précédentes, caractérisé en ce que le moyen d'enregistrement a une valeur monétaire qui peut être augmentée par paiement d'une certaine quantité de monnaie.

10. Système de transport en commun selon l'une quelconque des revendications précédentes, caractérisé en ce que le moyen d'enregistrement est aussi conçu sous la forme d'une carte de crédit classique.

11. Système de transport en commun selon l'une quelconque des revendications précédentes, caractérisé en ce que le dispositif destiné inscrire les distances parcourues dans le moyen de mémorisation d'un moyen d'enregistrement comprend un moyen de contrôle placé aux points où l'on quitte le système de transport en commun.

12. Système de transport en commun selon l'une quelconque des revendications précédentes, caractérisé en ce que les dispositifs destinés à inscrire, dans le moyen de mémorisation d'un moyen d'enregistrement, les distances parcourues inscrit aussi dans le moyen de mémorisation des informations relatives au temps.

13. Système de transport en commun selon l'une quelconque des revendications précédentes, caractérisé par un moyen de détection destiné à compter le nombre de passagers montant dans le moyen de transport et en descendant.

14. Procédé destiné à exploiter un système de transport en commun à l'aide d'un ou de plusieurs opé-

rateurs, dans lequel on fournit à au moins plusieurs passagers un moyen d'enregistrement comprenant un moyen de mémorisation pouvant être lu et écrit, caractérisé en ce que des dispositifs sont prévus au moyen desquels un passager peut inscrire dans le moyen de mémorisation de son moyen d'enregistrement la distance qu'il a parcourue avec le système de transport en commun, et en ce qu'aux points de vente de titres de transport, la distance totale parcourue, enregistrée dans le moyen de mémorisation présenté par le passager, est lue et utilisée pour déterminer le prix de vente du titre de transport suivant et/ou la réduction à effectuer sur ce titre de transport.

15. Procédé selon la revendication 14, caractérisé en ce que la distance parcourue est déterminée par période de temps, et en ce que le prix de vente du titre de transport suivant et/ou la réduction à effectuer sur ce titre de transport sont déterminés en se basant sur cette distance.