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(54) **Method of and parking management system for managing the issuing of parking right and a parking space navigation system for use with said method**

(57) The present invention is directed to a method of managing the issuing of parking rights in an area comprising a plurality of parking places, wherein said parking rights are issued by a parking management party through a plurality of parking operators providing said parking rights to users for parking in said parking spaces. According to said method, providing at least one parking right by a providing parking operator of said parking operators to a user comprises the steps of: receiving from

said user, by said providing parking operator, a request for said at least one parking right; said providing parking operator providing said at least one parking right to said user in response to said request by forwarding parking right data of said at least one parking right to a parking database to which said parking operators are operatively connected; and storing said parking right data in said database for managing said issuing of parking rights. The invention is further directed to a parking management system.

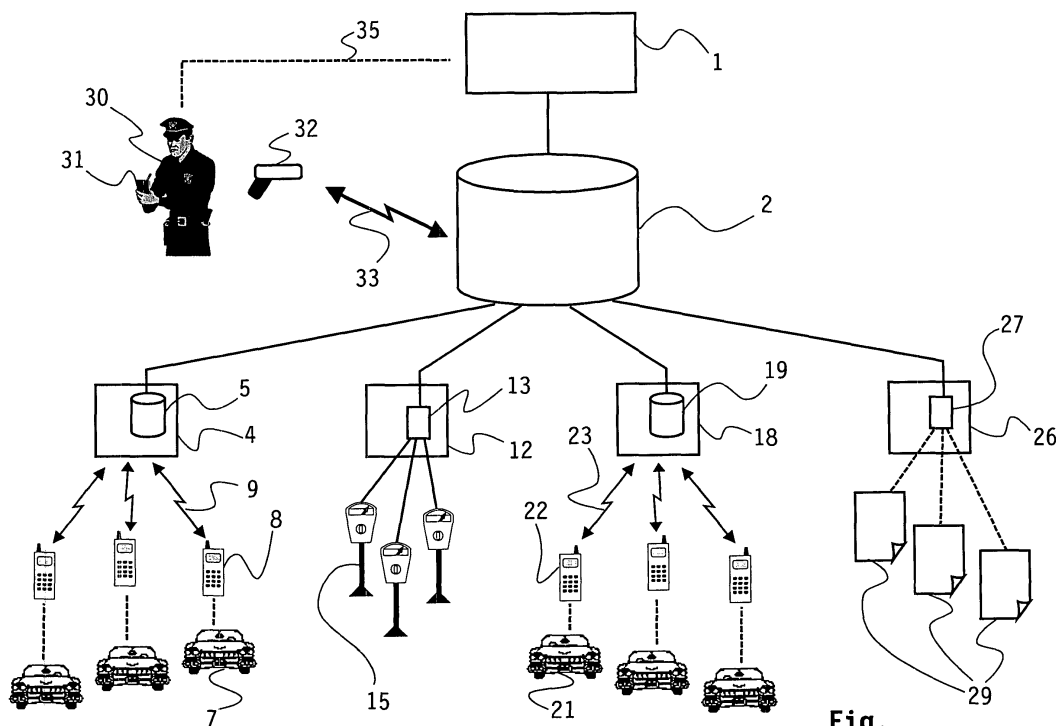


Fig.

Description

[0001] The present invention relates to a method of managing the issuing of parking rights in an area comprising a plurality of parking places, wherein said parking rights are issued by a parking management party through a plurality of parking operators providing said parking rights to users for parking in said parking spaces.

[0002] The present invention further relates to a parking management system for use with a method as described above, and a computer program for use in such a system.

[0003] The present invention further relates to a parking space navigation system for use with a method as described above.

[0004] In cities and other larger areas, the issuing of parking rights for parking vehicles within the city, e.g. by the side of the road, is often the task of a community counsel. The community counsel may delegate this task to one or more of parking operators, allowing them to provide parking rights to users or customers in exchange for payment.

[0005] Each parking operator may, for instance, facilitate parking in a specific part or area within the city. Parking operators may also exploit a parking garage within the city. Another possibility is that a department of the city counsel, or another governmental organisation, is responsible for management and maintenance of parking rights distribution systems, such as parking metres, parking ticket dispensers, and the like, which systems enable users to acquire a parking right for a specific duration of time, also referred to as an incidental parking right.

[0006] Another trend in modern parking business is the use of mobile phones to assist the provisioning of parking rights to customers. As an example of such a service, a user or customer may park his car within a mobile parking zone, after which the user calls a dedicated telephone number, and types in a zone number and a client identification number (e.g. his vehicle license plate number). His parking right is thereby established, and the duration of the parking activity is registered in a centralized server of the parking operator. At the end of the parking activity, the parking right may be ended by the customer the same way as it was started, by making a phone call to a telephone number and providing his client number. When during a parking activity a parking warden, charged with verifying the existence or validity of parking rights for parked vehicles, passes the customer's car, he may simply consult the database of the parking operator, e.g. using a handheld computer or a dedicated wireless device, to verify the validity of the parking right.

[0007] A disadvantage of providing parking rights using a plurality of parking operators, is that all these operators may use different parking right distribution systems and methods for providing the parking rights to the customer. One or more parking operators may use the

concept of mobile phone assisted parking, while other parking operators simply make use of parking tickets (e.g. exploiting a parking garage). In addition, the city counsel may in some parts of the city make use of parking metres. Altogether, it becomes very difficult for a city counsel to keep track on parking statistics in the city, and to identify or resolve parking problems, since all the distribution systems must be consulted and a number of these systems are only accessible by the parking operators using them.

[0008] In particular, each system used to assist the distribution parking rights has its own method of registering parking activity. Some systems, such as old fashioned parking metres, do not register any information about parking activity. For old fashioned parking metres, the amount of inserted coins may be counted and registered, giving some clue of the amount of parking activity through said parking metre, but on a very low level without detail. Other systems may be equipped with memory means for providing a list of dispensed parking tickets upon request. However, this list must be analysed by the city counsel separately.

[0009] As a result, a city counsel must analyse information regarding parking activity in a city bit by bit in order to gain insight in the 'big picture'. As will be understood, this has a negative effect on adapting parking policy or gaining insight in the amount of income generated through parking in the city.

[0010] In addition, a park warden charged with verifying the existence and validity of parking rights has to get used of all the different systems that are implemented for distributing the parking rights amongst users. The parking warden must check whether there is a parking ticket on the dashboard of a car, if this is not the case, he must type in the license plate number on a mobile device in order to check the availability of this license plate number in the database of a parking operator. If there are several parking operators using the concept of mobile phone assisted parking, the park warden must verify every database used for registering parking rights managed by every parking operator.

[0011] Another problem is created when providing parking rights in specific areas of a city is delegated to specific operators, each operator running his area within a city. Suppose a number of these operators use the concept of mobile phone assisted parking. The city may thus be divided in different areas managed by specific operators, and each area may comprise one or more mobile parking zones where mobile phone assisted parking service of that specific operator may be used.

[0012] In order to be able to provide an acceptable level of service, it must be possible for a user of the mobile parking service of parking operator A, to park his car in a mobile zone which is falling within an area managed by parking operator B. With each parking operator running its own parking rights distribution system, and running its own mobile phone assisted parking service, this will be extremely complex to facilitate. There must be

some kind of information exchange between different operators in order to be able to provide a mobile parking service stretching out over the full area of the city. Even if the exchange of information can be arranged, than still implementation will rise legal and financial problems, since each parking operator may use its own payment scheme and terms and conditions for providing the mobile phone assisted parking service.

[0013] Yet another disadvantage of prior art methods and systems is that no up to date insight is gained in present parking activity at a specific point in time.

[0014] It is therefore an object of the present invention to provide a method and system for of managing the issuing of parking rights, which enables seamlessly integrating different parking distribution systems used within a predefined area.

[0015] This and other objects are achieved by the present invention in that there is provided a method of managing the issuing of parking rights in an area comprising a plurality of parking places, wherein said parking rights are issued by a parking management party through a plurality of parking operators providing said parking rights to users for parking in said parking spaces, wherein providing at least one parking right by a providing parking operator of said parking operators to a user comprises the steps of: receiving from said user, by said providing parking operator, a request for said at least one parking right; said providing parking operator providing said at least one parking right to said user in response to said request by forwarding parking right data of said at least one parking right to a parking database to which said parking operators are operatively connected; and storing said parking right data in said database for managing said issuing of parking rights.

[0016] By using a parking database wherein each of the parking operators stores parking right data, the data is available in a central repository, enabling instant information provisioning regarding all parking activity performed by issuing parking rights through said parking operators. Said parking operators may include all operators that provide parking rights to users within the full area mentioned above, enabling direct knowledge of all parking activity in the area and improving control over parking policy. As an example, a city counsel may consult a parking database to which all parking operators are connected, in order to acquire parking statistics and in order to adapt the parking policy in the city.

[0017] Another advantage of the use of a central parking database, is the fact that it enables central registration of parking rights, whilst each of the parking operators may at the same time run its own administration systems in order to manage parking activity of their own customers. Administration and financial settlement of parking activity will be performed by the parking operators independent from each other, and without having to rely on information exchange. As an example, suppose parking operator A is authorised to provide parking rights to users in neighbourhood A in a city. Parking operator A offers a

mobile (phone assisted) parking service to its customers. Suppose further that parking operator B also provides mobile phone assisted parking in neighbourhood B in the same city. A customer of parking operator A parks his car in one of the mobile parking zones in neighbourhood B, managed by parking operator B. Parking operator B provides the customer a parking right and forwards and stores the parking right details in the parking database, which is for example owned by the city counsel. Since the parking right details are stored in the parking database, parking operator A can follow all parking activity of its customer everywhere in the city. Therefore, if the customer parks his car in neighbourhood B and uses the mobile phone assisted parking service through operator B, the use of the service can be billed by parking operator A. Therefore the terms and conditions agreed between parking operator A and the customer can be applied to the use of the mobile phone assisted parking service, while the fact that parking operator B actually provided the service is transparent to the customer.

[0018] In addition the above-described example, parking operator B receives a payment for the use of its service from parking operator A. Also and, because of the use of the parking database, independent from the payment made by operator A to operator B, the city counsel receives the official parking fee or parking tax from operator A.

[0019] The above-described example clearly demonstrates that the method of the present invention not only provides instant insight in parking statistics, but in addition enables the provisioning of parking rights to customers of the parking operators in such a way that the underlying structure of parking operators running their own partial area becomes transparent to the customer. As far as the customer is aware, the mobile phone assisted parking service is always provided by a single operator under the agreed terms and conditions. The use of a central parking database to which the parking operators are connected also reduces the complexity of the financial settlement of the provisioning of the services by the operators.

[0020] According to an embodiment of the invention, the parking right data comprises vehicle identification data of a vehicle for which at least one parking right is intended. This vehicle identification data may comprise a license plate number of the vehicle, or alternatively license identification data of a parking license issued for said vehicle. In both cases the identification data is unique for each vehicle.

[0021] The vehicle identification data may be provided by the user to the parking operator, according to an embodiment of the invention. It may however alternatively be retrieved from an operator database, upon receipt of the request for a parking right from the user. Giving a specific example of this latter embodiment; a customer may use his mobile phone to call the mobile phone assisted parking operator number for a specific mobile parking zone. If the customer is known to the parking operator

managing the provisioning of parking rights in the specific area, calling line identification data (CLID) of the call to the operator number may be used by the operator to recognise the customer and match him in an operator database and to retrieve his license plate number. As will be understood, the customer may be provided an opportunity to use a different license plate number for parking a different car using the service, e.g. by providing said license plate number over the phone.

[0022] The parking right data may include a variety of details regarding the parking right provided. In an embodiment, duration data of the duration of the parking activity is stored in a parking database. This duration may for example include a fixed time limit for which the parking right is valid, however alternatively the parking right might be flexible depending on the desired duration of the parking activity.

[0023] In case a flexible parking right is issued, said step of storing said duration data comprises the step of storing in said database an indication of a starting moment on which the parking right becomes effective. This starting moment may include starting time or starting date of the day on which the parking right has (or will) become effective. At the end of the parking activity, said step of storing said duration data further comprises the step of storing in said parking database an indication of an ending moment on which the parking right ceases to be effective. Said ending moment may similarly include the ending time or ending date of the day on which the parking right ceases to be effective.

[0024] It will be understood that the total duration of the parking right may be fixed up front, e.g. by the customer providing to the parking operator the desired duration of the parking activity, or may be limited by regulations, for instance by the city counsel only allowing parking in a certain area for a short period of time (e.g. two hours) in which case this may be specified in the parking database.

[0025] It is not necessary for the customer or the parking operator to forward the starting date and starting time and or ending date and ending time to the parking database. The sending of parking right data to the central database for example a step of determination of the moment on which the parking right data is received in the central database, and fixing and storing a determined moment in time as the starting moment of the parking right. In addition, a similar trigger may be sent through the parking operator to the central parking database at the end of the parking activity. In the case of a regulated limited duration of the parking right, the ending moment of the parking right may be determined automatically (by a server or other means on which the central parking database is stored), and may be stored in the central database.

[0026] The parking right data may further include location data for which the parking right is provided. This location data may be valid for a specific location, e.g. a specific parking place within the parking area, or within

a part of the area such as a certain street, or a parking lot or parking garage.

[0027] In a preferred embodiment of the present invention, the method further includes a step of accessing said parking database for verification of existence or validity of a parking right for a parked vehicle. This enables an enforcement of the parking policy by the parking management party (e.g. the city counsel). A traffic warden may for instance retrieve a list of valid parking rights for a certain street within the city limits, or within another partial area of the area comprising the parking places. This list may be used by the traffic warden to verify whether the vehicles parked within the area are registered as having a valid parking right in the parking database. The traffic warden may thus walk through the street and check license plate numbers of parked vehicles on the retrieved list.

[0028] In another embodiment of the present invention, said step of accessing said parking database comprises a step of querying the parking database for the availability therein of parking data comprising vehicle identification data of a parked vehicle within the area comprising the parking places. Here the traffic warden may for instance forward the details of a specific vehicle to the parking database and receive parking right details for that vehicle, or may simply receive a notification on whether or not a parking right for the vehicle exists or is still valid.

[0029] Accessing the parking database may, according to an embodiment of the invention, be performed by using a mobile querying device arranged for remote access. In this case the traffic warden may simply type in the license plate number or, alternatively, a parking license number of a vehicle in the mobile querying device. Through a (wireless) connection with the parking database the traffic warden then receives the required details.

[0030] In another embodiment, the mobile querying device is arranged for acquiring the vehicle identification number in a different manner than by receiving input from the traffic warden. In this case the mobile querying device may for instance be equipped with scanning means for scanning a license plate number of the parked vehicle, or a bar code scanner for scanning a bar code of a parking license number for the vehicle.

[0031] In another embodiment, the mobile querying tool may be arranged for sensing the presence of a computer chip within the vehicle on which all details of the vehicle are listed. Such chips are nowadays available as anti theft protection of vehicles.

[0032] In yet another embodiment, the vehicle is equipped with a transponder which is arranged for establishing a wireless connection with the mobile querying tool of the traffic warden, for providing all of the details required for verification of the parking right.

[0033] As will be understood parking rights may be available in a large variety of forms and types, such as incidental parking rights (parking tickets for incidental parking by the side of a road), parking licenses, parking

exemptions, but also mobile phone assisted parking rights and the like. A parking operator may provide parking rights using a mobile phone assisted parking service, but may alternatively provide parking tickets using a parking ticket dispenser by the side of a road, or by providing an entrance card to a parking garage and collecting the entrance cards upon exit of the vehicle from the parking garage.

[0034] Parking licenses, issued by the city counsel, may also be registered in the central parking database. Therefore a department working under the responsibility of the city counsel, may be a 'parking operator' as meant in the present invention. It is noted that a 'parking operator' in accordance with the present invention may comprise every party which provides parking rights to users for parking their vehicles within the area.

[0035] The term 'parking management party' uses for describing the present invention, should be understood as the party responsible for issuing the parking rights. This may be a city counsel, however it may also be a private owner of a large parking terrain on which one or more parking operators are used for providing the parking rights.

[0036] In according with an embodiment of the invention, the method further comprises a step of querying the database by the parking management party for providing at least one parking statistics report. As described above, the parking statistics report can be used to the benefit of the management party for e.g. financial purposes, or adapting its parking policy.

[0037] In accordance with a particular embodiment, said step of providing at least one parking statistics report comprises consolidating parking right data from the parking database in dependence of location data of stored parking rights data in said parking database, for providing a location dependent parking statistics report for said area. Using the method of the present invention, detailed insight in parking behaviour throughout the day, popularity of parking places (by choice dependent on time of the day), and insight in available unused parking places at any particular moment in time can be gained from the parking database. Such information may be of particular value to a city counsel for determining parking policy for the city.

[0038] In another embodiment of the invention, the parking right is provided to the user in exchange for a payment, and the parking data comprises payment data for the parking right. In particular, the parking right data may include the official parking fee (parking tax) for parking the vehicle on the specific location, and in addition may include payment details of the operator used for parking the vehicle. This information can be used to the benefit of all parties (the parking management party and all parking operators) for the financial settlement of parking activity within the area, and as management information for the operators or parking management party.

[0039] According to another embodiment of the present invention, location data of issued parking rights

are stored in said parking database, and said method further comprises instead of providing an indication of available unused parking spaces in said area using said location data of parking rights stored in said parking database. In particular such a method may comprise a further step of providing said indication of available unused parking spaces to a user before said request for at least one parking right is received. This enables guiding the user to at least one of the available unused parking spaces. This guiding may be performed by providing an indication to the user by presenting the indication on a sign, such as a sign by the sight of the road.

[0040] Another possibility is that the indication of available unused parking spaces is received by the user through receiving means installed within his vehicle. These receiving means may cooperate with navigation means in said vehicle for guiding the user to at least one of the available unused parking spaces. Many vehicles are nowadays equipped with navigation systems, that could beneficially be used for guiding the user to an available parking space.

[0041] In relation to the above, it is notified that the present invention enables guiding the user to every particular available parking space, which is not being used, in the full area managed using the method of the present invention. This includes not only an indication of available parking spaces in parking garages, but also available parking space by the side of the road and the like.

[0042] According to a second aspect of the present invention, there is provided a parking management system for use with a method according to any of the previous claims, wherein said system comprises a parking database, wherein said parking database is connected to a plurality of parking operator systems used by a plurality of parking operators for providing said parking rights to users, wherein each of said parking operator systems comprises means for receiving user requests for at least one parking right, and means for forwarding parking right data to said parking database for providing said parking right to said user.

[0043] According to a third aspect of the present invention, there is provided a computer program for use with a system according to the second aspect described above, said computer program enabling the system to carry out the method according to the first aspect of the invention.

[0044] According to a fourth aspect of the present invention, there is provided a parking space navigation system for installation in a vehicle, comprising receiving means arranged for receiving an indication of at least one available unused parking space in accordance with the method as described above. Said parking navigation system may comprise control means arranged for cooperating with navigation means in said vehicle, for guiding said user to at least one of said available unused parking spaces using said navigation means.

[0045] The above-mentioned and other features and advantages of the invention are illustrated in the following

description of an embodiment of the present invention, with reference to the enclosed drawing.

[0046] The enclosed figure schematically shows a parking management system according to the invention, that can be used for performing the method of the present invention.

[0047] In the figure a parking management party who owns or who is authorized to issue parking rights, such as city counsel 1, is owner of a parking database 2. Employees working at the city counsel 1 may consult parking database 2 using a computer (not shown) and a connection through a telecommunication network such as an intranet or the internet (not shown).

[0048] In the present example, the city counsel 1 does not provide the individually issued parking rights to users themselves, but delegates this task to a plurality of parking operators 4, 12, 18, 26. The city counsel 1 therefore issues the parking rights, and uses a provisioning or distribution system for providing the parking rights through a plurality of parking operators 4, 12, 18, 26. In return for issuing a parking right, the city counsel receives a parking tax or official parking fee from the parking operator providing the parking right to a user. In addition, the parking operator 4, 12, 18, 26 may request from a user, in return for providing the parking right, a payment amount consisting of the official parking fee to be paid to the city counsel 1 and an additional operator fee covering expenses and providing income to the parking operator 4, 12, 18, 26. As will be understood, the operator fee is optional.

[0049] Each of the operators 4, 12, 18, 26 is connected to the parking database 2. The operators 4, 12, 18, 26 and the services or service level they provide to their users, are of different nature.

[0050] Parking operator 4, just as parking operator 18, provides a mobile phone assisted parking service to its users. Users may have a subscription with parking operator 4 and, as is schematically indicated in the figure, when a user wants to park his car 7 he makes a telephone call (schematically indicated by double arrow 9) with his mobile telephone 8 to a telephone number of the parking operator. Alternatively he may send a short messaging service (SMS)-message, or the like. Through the wireless connection 9, the user may provide identification details of his vehicle 7, e.g. by typing in his license plate number on his mobile phone 8. In addition, he may provide an indication of the location where his vehicle 7 is parked, and/or the desired or intended duration of the parking activity (e.g. in terms of starting time and ending time). These details may be registered by parking operator 4 in an operator database 5, however the use of such a database is only optional within a parking system according to the present invention.

[0051] Parking operator 18 offers to his customers a similar service as parking operator 4: a customer may be subscribed to parking operator 18 and may park his car 21 in a certain area by making a telephone call 23 with a mobile phone 22 to a dedicated number of the parking

operator 18. The database 19 is an operator database of parking operator 18 wherein details of the provided parking rights or details of the customer (or the like) are stored.

[0052] Other parking operators, such as parking operator 12 may exploit a plurality of parking metres or parking ticket dispensing machines, such as parking metre 15. These parking metres (15) may be connected to a central server 13 of the parking operator 12. The central server 13 is, in the present example, connected to parking database 2 via a telecommunication network (not shown).

[0053] Alternatively, parking operator 26 may be embodied by the department of the city counsel 1 authorised to provide parking licenses, schematically indicated by papers 29, to users. The parking licenses provided may be registered using a central server 27 connected to the parking database 2. It will be understood that each of the servers and databases (5, 13, 19, 27) of the parking operators 4, 12, 18 and 26 may be connected with each other or with other servers and databases for information or management purposes. For simplicity, and for increasing intelligibility of the figure, any further connection between systems of each of the operators 4, 12, 18 and 26 with any other operator or any other party are not shown in the figure.

[0054] According to the method of the present invention, when a parking right is provided to a user, such as the provisioning of a parking license 92 by parking operator 26 to a user, parking right data is forwarded to the parking database 2 (in the present example by server 27) where it is stored. Parking operator 26 may for example store the parking license number of the license provided, license plate number of the vehicle for which the parking license is issued, validity data of the parking license such as starting date, starting time, ending date and ending time, area or partial area for which the parking is valid (e.g. only within a certain neighbourhood in the city) personal identification details of the person to whom the parking license is issued, etc.

[0055] In order to enforce the parking policy by the city counsel 1, the police or a dedicated department of the city counsel, or another enforcement party, is authorised to verify the validity or existence of parking rights of parked vehicles in the city. A traffic warden 30 working for such an enforcement party, may want to verify the existence of a valid parking right for car 21 parked alongside the street. As described above, car 21 has been parked using a mobile phone assisted parking service, by the user making a phone call 23 using his mobile phone 22 to a telephone number of parking operator 18.

[0056] Suppose that vehicles are only allowed to park for limited amount of time (e.g. two hours) in the area where car 21 is parked. By making the parking request with his mobile phone 22, the user triggered in database 2 the recording of a starting time of the parking right, e.g. at 13:06 p.m. The traffic warden arrives at car 21, e.g. at 15:53 p.m., and wants to verify whether car 21 is validly parked. Traffic warden 30 may use a personal digital as-

sistant (PDA) or handheld computer 31 enabling him to make a wireless connection 33 with database 2 to verify whether or not a parking right for car 21 exist within database 2 or whether or not an existing parking right is still valid. Alternatively, instead of a PDA 31, the traffic warden 30 may use a hand scanner 32 to scan the license plate number of car 21. Character recognition means (not shown) within hand scanner 32 translate and provide the license plate number in digital format as an output signal. Optionally, the license plate number may be shown on a small 1 screen (not shown) on hand scanner 32 to the traffic warden 30, to verify whether or not the license plate number has been correctly recognised by the hand scanner 32. After confirmation by the traffic warden 30, the license plate number is forwarded via wireless connection 33 to database 2 by wireless communication means (not shown) of hand scanner 32. Parking database 2 may forward the requested parking data available in the database 2 back to hand scanner 32, where it is revealed to traffic warden 30 on a small screen (not shown). Alternatively, the database 2 may simply send a signal true or false, providing an indication on whether or not a valid parking right exists for car 21 in database 2.

[0057] In the present case, a parking right for car 21 for parking it at a location where it is presently parked, has existed in the past, but ceased to be valid on 15:06 p.m. The traffic warden 30 notes that no valid parking right exists for car 21 and writes a ticket for car 21 includes a parking fine, or an extra tax for administration purpose. This is reported back by traffic warden 30 to the city counsel (schematically indicated by dotted line 35), and may also be recorded in the parking database.

[0058] The information in the database may also be used for providing detailed information about unused available parking spaces in the city, by option on request of the user, or by providing signs to available parking spaces by the side of the road.

[0059] It will be appreciated that numerous modifications and variations of the present invention are possible in the light of the above teachings. It is therefore understood that within the scope of the appended claims, the invention may be practised otherwise than as specifically described herein.

Claims

1. Method of managing the issuing of parking rights in an area comprising a plurality of parking places, wherein said parking rights are issued by a parking management party through a plurality of parking operators providing said parking rights to users for parking in said parking spaces, wherein providing at least one parking right by a providing parking operator of said parking operators to a user comprises the steps of:

receiving from said user, by said providing park-

ing operator, a request for said at least one parking right;

said providing parking operator providing said at least one parking right to said user in response to said request by forwarding parking right data of said at least one parking right to a parking database to which said parking operators are operatively connected; and
 storing said parking right data in said database for managing said issuing of parking rights.

2. Method according to claim 1, wherein said parking right data comprises vehicle identification data of a vehicle for which said at least one parking right is intended.

3. Method according to claim 2, wherein said vehicle identification data is provided by said user to said parking operator.

4. Method according to claim 2, wherein said vehicle identification data is retrieved by said providing parking operator from an operator database.

5. Method according to any of the previous claims, wherein said vehicle identification data comprises at least one element of a group comprising parking licence identification data of a parking licence issued for said vehicle, or licence plate number of said vehicle.

6. Method according to any of the previous claims, further comprising a step of storing duration data of said parking right in said parking database, wherein said duration data is indicative of the duration of said at least one parking right.

7. Method according to claim 6, wherein storing said duration data comprises a step of storing in said database an indication of a starting moment on which said parking right becomes effective.

8. Method according to claim 7, wherein said starting moment comprises at least one element selected from a group comprising starting date, or starting time of the day on which said parking right becomes effective.

9. Method according to any of the claims 6-8, wherein storing said duration data further comprises a step of storing in said database an indication of a ending moment on which said at least one parking right ceases to be effective.

10. Method according to claim 9, wherein said ending moment comprises at least one element selected from a group comprising ending date, or ending time of the day on which said parking right ceases to be

effective.

11. Method according to any of the claims 9 or 10, wherein said step of storing said ending moment is performed when said parking right ceases to be effective. 5
12. Method according to any of the claims 6-11, wherein forwarding said parking right data comprises sending a data signal by said parking operator to said parking database, wherein receiving of said data signal by said parking database triggers said step of storing duration data. 10
13. Method according to any of the previous claims, wherein said parking right data further includes location data of a location or part of said area comprising said parking places for which location said at least one parking right is valid. 15
14. Method according to any of the previous claims, further comprising a step of accessing said parking database for verification of existence or validity of a parking right for a parked vehicle. 20
15. Method according to claim 13 and 14, wherein said step of accessing said parking database comprises a step of retrieving a list of valid parking rights for locations within at least a part of said area comprising said parking places. 25
16. Method according to claim 14, wherein said step of accessing said parking database comprises a step of querying said parking database for the availability therein of parking data comprising vehicle identification data of a parked vehicle within said area comprising said parking places. 30
17. Method according to any of the claims 14-16, wherein said parking database is accessed using a mobile querying device arranged for remotely accessing said parking database. 35
18. Method according to claim 16 and 17, further comprising a step of acquiring said vehicle identification number of said parked vehicle using said mobile querying device. 40
19. Method according to claim 18, wherein said step of acquiring said vehicle identification number comprises at least one element selected from a group comprising scanning a licence plate number of said parked vehicle, scanning a parking licence number of a parking licence issued for said vehicle, establishing an operative connection between said mobile querying tool and a data chip attached to said vehicle, establishing an operative connection between said mobile querying tool and a transponder in said 45

vehicle.

20. Method according to any of the previous claims, wherein said at least one parking right comprises at least one element of a group comprising incidental parking rights, parking licences, parking exemptions. 5
21. Method according to any of the previous claims, further comprising a step of querying said database by said parking management party for providing at least one parking statistics report. 10
22. Method according to claim 21, in dependence of claim 13, wherein said step of providing said at least one parking statistics report comprises consolidating parking right data from said database in dependence of said location data for providing a location dependent parking statistics report for said area. 15
23. Method according to any of the previous claims, wherein said at least one parking right is provided to said user in exchange for a payment, and wherein said parking data comprises payment data for said parking right. 20
24. Method according to any of the previous claims, further comprising a step of storing parking tax data in said parking database for said at least one parking right. 25
25. Method according to any of the previous claims, in dependence of claim 13, further comprising a step of providing an indication of available unused parking spaces in said area using said location data of parking rights stored in said parking database. 30
26. Method according to claim 25, wherein before said step of receiving said request, said method further comprising a step of providing said indication of available unused parking spaces to said user for guiding said user to at least one of said available unused parking spaces. 35
27. Method according to claim 26, wherein said step of providing said indication to said user comprises presenting said indication to said user on a sign, such as a road sign. 40
28. Method according to claim 26 or 27, wherein said indication is provided to receiving means comprised within a vehicle of said user. 45
29. Method according to claim 28, wherein said receiving means cooperate with navigation means in said vehicle for guiding said user to said at least one available unused parking space. 50
30. Parking management system for use with a method 55

according to any of the previous claims, wherein said system comprises a parking database, wherein said parking database is connected to a plurality of parking operator systems used by a plurality of parking operators for providing said parking rights to users, wherein each of said parking operator systems comprises means for receiving user requests for at least one parking right, and means for forwarding parking right data to said parking database for providing said parking right to said user.

31. Parking management system according to claim 30, wherein said means for receiving user requests are further arranged for receiving vehicle identification data of a vehicle for which said parking right is intended.

32. Parking management system according to claims 30 or 31, wherein at least one of said parking operator systems comprises a database for storing vehicle identification data of vehicles for which parking rights have been requested.

33. Parking management system according to any of the claims 30-32, wherein said parking database is arranged for storing at least one element selected from a group comprising request identification data of said request for said at least one parking right, vehicle identification data such as license plate number or parking license identification data, starting date of said parking right, starting time of said parking right, ending date of parking right, ending time of parking right, location data for which said at least one parking right is valid.

34. Parking management system according to any of the claims 30-33, further comprising querying means arranged for accessing said parking database for verification of existence or validity of a parking right for a parked vehicle.

35. Parking management system according to claim 34, wherein said querying means comprise at least one mobile querying device arranged for remotely querying said parking database.

36. Parking management system according to claim 35, wherein said mobile querying device is arranged for acquiring a vehicle identification number of a parked vehicle.

37. Parking management system according to claim 36, wherein said means for acquiring said vehicle identification number comprises at least one element selected from a group comprising scanning means for scanning a license plate number of said parked vehicle, or for scanning a parking license number of a parking license issued for said vehicle, sensing

means for establishing an operative connection with a data chip attached to said vehicle, receiving means such as an antenna for providing an operative connection with a transponder in said vehicle.

38. Parking management system according to any of the claims 30-37, wherein said parking database is further arranged for providing at least one parking statistics report.

39. Computer program for use in a system according to any of the claims 30-38, for carrying out a method according to any of the claims 1-29.

40. Parking space navigation system for installation in a vehicle, comprising receiving means arranged for receiving on indication of at least one available unused parking space in accordance with any of the claims 28 or 29.

41. Parking space navigation system according to claim 40, further comprising control means arranged for cooperating with navigation means in said vehicle, for guiding said user to said at least one available unused parking space using said navigation means.

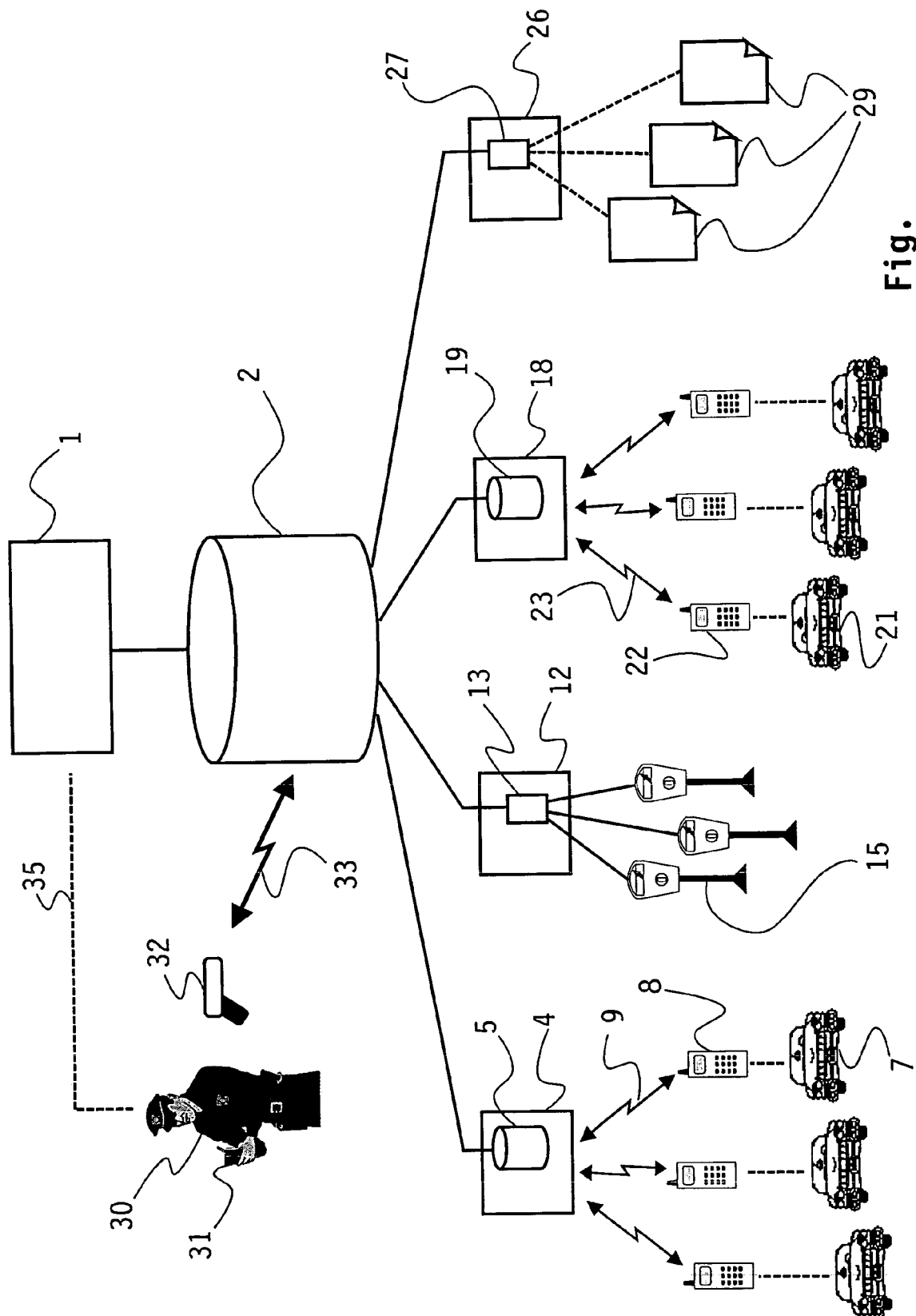


Fig.



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 05 07 6735

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Place of search Munich		Date of completion of the search 2 September 2005	Examiner Bauer, R
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