(54) Title: PROCESS AND SYSTEM FOR CONTROLLING AND PAYING PARKINGS

(57) Abstract: Process for controlling and/or paying at least one parking (2), characterized by comprising the following operative steps: a user sends by means of a first SMS device (3) a first SMS message (4) containing an identification code (6) of the user and an identification code (7) of a vehicle (1) parked in the parking (2); a second SMS device (12) receives the first SMS message (4), extracts therefrom the identification codes (6, 7) of the user and of the vehicle (1) and inserts them into at least one first database (14); the second SMS device (12) sends to a third SMS device (18) a third SMS message (20) containing at least the identification code (7) of the vehicle (1) contained in the first database (14); the identification code (7) contained in the third SMS message (20) is compared with the identification code (7) of the vehicle (1) parked in the parking (2). The present invention also relates to a system that carries out said process.
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PROCESS AND SYSTEM FOR CONTROLLING AND PAYING PARKINGS

The present invention relates to a process for controlling and paying parkings, and in particular to a process for controlling and paying parkings based on SMS devices and messages. The present invention also relates to a system that carries out said process.

In known process and system the owner of a parked vehicle sends from his own cellular telephone to a particular SMS device arranged in proximity to the parking a SMS message containing the estimated duration of the occupation of the same parking. According to the SMS message received, the SMS device prints a ticket to be inserted into the vehicle in a manner visible from the outside for possible controls and calculates a debit which is withdrawn from a user's account at a credit holder, for example the user's cellular telephone provider.

However, the system which carries out this known process requires the installation of at least one post comprising said SMS device and a printer at the parking to be controlled, so that it may be tampered and is very expensive if it is desired to control parkings spread over the territory. Furthermore, the user must estimate in advance the occupation time of the parking, so that he risks to pay too much or to be sanctioned if the estimated time is longer or shorter than the actual one.

It is therefore an object of the present invention to provide a process and a system which are free from said disadvantages. Said object is achieved with a process and a system, the main features of which are specified in claims 1 and 13, respectively, while other features are specified in the remaining claims.

Thanks to the particular employed identification codes and SMS messages, the process and the system according to the present invention allow to control and pay parkings in an automatic manner by means of known SMS devices, with consequent decrease of the installation complexity and costs.

Furthermore, by sending a SMS message at the arrival and a SMS at the departure from the parking, the user can pay the parking for the exact duration of its occupation, without wastes or sanction risk. For this purpose, the process and
the system according to the present invention allow to send SMS messages to the user for reminding him the parking occupation and/or for communicating him the amount due at the end of the occupation.

According to a particular aspect of the invention, the identification codes of the user and of his vehicle consist of the numbers of his cellular telephone and of the vehicle plate, so as to favor the user by simplifying the process and the use of system from his side.

Further advantages and features of the process and the system according to the present invention will become clear to those skilled in the art from the following detailed and non-limiting description of an embodiment thereof with reference to the attached drawings in which figure 1 shows a block scheme of the system according to said embodiment of the invention.

Referring to figure 1, it is seen that in the process according to the present invention a user, in particular the owner of a vehicle 1, after he has parked the latter in a parking 2, sends by means of a first device 3 suitable for sending and, if desired, receiving SMS messages, for example a known digital cellular telephone, a first SMS message 4 containing an identification code 5 of parking 2, an identification code 6 of the user, and an identification code 7 of vehicle 1. For example, the identification code 5 of parking 2, which can be absent in other embodiments of the present invention, can consist of a number shown on one or more signs 8 arranged close to parking 2 and coincide, if desired, with the telephone number of the addressee of the first SMS message 4. Further, the identification code 6 of the user can coincide with the identification number of the first SMS device 3, that is, if it is a cellular telephone, the relevant telephone number which is generally sent in an automatic manner with the first SMS message 4. Finally, the identification code 7 of vehicle 1 can coincide with the number of plate 9 of the same vehicle.

The first SMS message 4, after it has been received by a radio antenna 10, is sent through one or more telephone and/or data networks 11 to a second device 12 suitable for sending and receiving SMS messages, for example a known computer provided with a telephone board or modem. The second SMS device 12 receives
the first SMS message 4, extracts therefrom the identification codes 6, 7 of the
user and the vehicle and inserts them into at least one record 13 of at least one first
database 14 contained in a memory which is generally installed into the same
computer. In the present embodiment of the invention only one identification code
5 which coincides with the telephone number of the addressee of the first SMS
message 4, is associated to the second SMS device 12. In other embodiments of
the invention more identification codes 5 of parking 2 can be associated to the
second SMS device 12, in which case they are also associated to codes 6 and 7 in
database 14.
10 The time and/or the day 15 in which the first SMS message 4 is transmitted
by the first SMS device 3 or is received from the second SMS device 12 are
preferably associated to codes 6 and 7 in database 14. The time and/or the date 15
are generally inserted into the first SMS message 4 or can be obtained by a clock
16 installed or connected to the second SMS device 12. After having received the
first SMS message 4, the second SMS device 12 can send to the first SMS device
3 a second SMS message 17 which confirms the receipt of the first SMS message
4 and the consequent debiting start of the occupation cost of parking 2. Further
second SMS messages 17 can be periodically sent from the second SMS device
12 to the first SMS device 3 for reminding the user that said debit is running.
20 For controlling the occupation of parking 2, the second SMS device 12
sends to a third device 18 suitable for receiving SMS messages, for example a
digital cellular telephone arranged close to antenna 10 and connected to a
computer 19, a third SMS message 20 containing at least the identification code 7
of vehicle 1, which is stored and/or displayed in the third SMS device 18 and/or in
computer 19. A person assigned to the control of parking 2 or electronic image
grabbing means 21 connected to computer 19 insert in the latter the identification
codes 7 of one or more vehicles 1 parked in parking 2, for example their plate
numbers. The electronic means 21 can consist of a digital camera and a known
program for converting the images grabbed by the camera into an alphanumeric
format. Computer 19 or the same controller of parking 2 can therefore compare
the identification code 7 of vehicle 1 parked in parking 2 with the identification
code 7 sent by the second SMS device 12. If said codes should not correspond, vehicle 1 would result parked illegally in parking 2 and the controller could intervene for sanctioning the vehicle owner.

The user, after having removed vehicle 1 from parking 2, can send to the second SMS device 12, from the first SMS device 3 or from other SMS devices, a fourth SMS message 22 containing at least the identification code 7 of vehicle 1, so as to stop the debiting of the occupation cost of parking 2. The second SMS device 12 sends then to the third SMS device 18 a fifth SMS message 23, always containing the identification code 7, so as to communicate that vehicle 1 has abandoned parking 2. Said communication can be automatically forwarded to computer 19 which cancels the identification code 7 from those displayed and/or stored for the control of parking 2.

If desired, the second SMS device 12 can calculate the difference between the time and/or the date 15 associated to the identification code 7 in database 14 and the time and/or the date in which the fourth SMS message 22 has been sent or received, so as to obtain an amount to be debited to the user for the occupation of parking 2. For this purpose, the second SMS device 12 can send a message 24, for example through network 11, containing an identification code associated to the user, for example the identification code 6 present in database 14, as well as data 25 which vary according to said difference, in particular data relating to the occupation period of the parking or to its cost in a conventional value. Message 24 can be received by a computer 26 of a credit holder, for example of the telephone network provider of the first SMS device 3, which provides, according to the received data 25, for deducting the amount to be debited from a second database 27, in which the identification code 6 of the user is associated to at least one credit amount 28, as well as, if desired, for sending to the first SMS device 3 a sixth SMS message 29 containing data 25 and/or amount 28 updated after the debiting.

Modifications, if any, and/or additions may be made by the skilled in the art to the embodiment of the invention hereinabove described and illustrated while remaining within the scope of the same invention.
CLAIMS

1. Process for controlling and/or paying at least one parking (2), characterized by comprising the following operative steps:

- a user sends by means of a first SMS device (3) a first SMS message (4) containing an identification code (6) of the user and an identification code (7) of a vehicle (1) parked in the parking (2);
- a second SMS device (12) receives the first SMS message (4), extracts therefrom the identification codes (6, 7) of the user and of the vehicle (1) and inserts them into at least one first database (14);
- the second SMS device (12) sends to a third SMS device (18) a third SMS message (20) containing at least the identification code (7) of the vehicle (1) contained in the first database (14);
- the identification code (7) contained in the third SMS message (20) is compared with the identification code (7) of the vehicle (1) parked in the parking (2).

2. Process according to claim 1, characterized by comprising the following further operative step:
- the second SMS device (12) sends to the first SMS device (3) one or more second SMS messages (17) which confirm the receipt of the first SMS message (4).

3. Process according to one of the previous claims, characterized by comprising the following further operative steps:
- the user sends to the second SMS device (12), by means of the first SMS device (3) or other SMS devices, a fourth SMS device (22) containing at least the identification code (7) of the vehicle (1);
- the second SMS device (12) sends to the third SMS device (18) a fifth SMS message (23) containing at least the identification code (7) of the vehicle (1).

4. Process according to claim 3, characterized in that the time and/or the date (15) in which the first SMS message (4) is transmitted by the first SMS device (3) or is received by the second SMS device (12) are associated to the
identification codes (6, 7) of the user and of the vehicle (1) in the first database (14).

5. Process according to claim 4, characterized by comprising the following further operative steps:

- the second SMS device (12) calculates the difference between the time and/or the date (15) associated in the first database (14) to the identification code (7) of the vehicle (1) and the time and/or the date in which the fourth SMS message (22) has been sent or received;
- the second SMS device (12) sends a message (24) containing an identification code (6) associated to the user and data (25) variable according to said difference to a computer (26) of a credit holder, which deducts according to said data (25) an amount to be debited from a second database (27), in which the identification code (6) of the user is associated to at least one credit amount (28).

6. Process according to claim 5, characterized by comprising the following further operative step:

- the computer (26) of the credit holder sends to the first SMS device (3) a sixth SMS message (29) containing said variable data (25) and/or said credit amount (28).

7. Process according to one of the previous claims, characterized in that the first SMS message (4) contains an identification code (5) of the parking (2).

8. Process according to claim 7, characterized in that the identification code (5) of the parking (2) consists of a number shown on one or more signs (8) arranged close to the parking (2).

9. Process according to claim 7 or 8, characterized in that the identification code (5) of the parking (2) coincides with the telephone number of the second SMS device (12).

10. Process according to one of claims 7 to 9, characterized in that the identification code (5) of the parking (2) is associated to the identification codes (6, 7) of the user and of the vehicle (1) in the first database (14).

11. Process according to one of the previous claims, characterized in that the identification code (6) of the user coincides with the identification number of
the first SMS device (3).

12. Process according to one of the previous claims, characterized in that the identification code (7) of the vehicle (1) coincides with the number of its plate (9).

13. System for controlling and/or paying at least one parking (2), characterized by comprising:
   - a first SMS device (3) suitable for sending a first SMS message (4) containing an identification code (6) of a user and an identification code (7) of a vehicle (1) parked in the parking (2);
   - a second SMS device (12) suitable for receiving the first SMS message (4), extracting the identification codes (6, 7) of the user and of the vehicle (1), inserting them into at least one first database (14) and sending a third SMS message (20) containing at least the identification code (7) of the vehicle (1) contained in the first database (14);
   - a third SMS device (18) suitable for receiving the third SMS message (20) and storing and/or displaying the identification code (7) of the vehicle (1) contained in the third SMS message (20).

14. System according to claim 13, characterized in that the first SMS device (3) is a digital cellular telephone.

15. System according to claim 13 or 14, characterized in that the second SMS device (12) is a computer provided with a telephone board or modem.

16. System according to one of claims 13 to 15, characterized in that the third SMS device (18) is a digital cellular telephone connected to a computer (19).

17. System according to claim 16, characterized in that the third SMS device (18) is connected to electronic means (21) for grabbing images.

18. System according to claim 17, characterized in that the electronic means (21) for grabbing images comprise a digital camera and a program for converting the images grabbed by the camera into an alphanumeric format.

19. System according to one of claims 13 to 18, characterized in that the second SMS device (12) is suitable for sending to a computer (26) of a credit holder a message (24) containing an identification code (6) associated to the user,
as well as data (25) variable according to the occupation period of the parking (2) by the vehicle (1).

20. System according to claim 19, characterized in that the computer (26) of the credit holder is suitable for deducting, according to the data (25) received from the second SMS device (12), an amount from a second database (27), in which the identification code (6) of the user is associated to at least one credit amount (28).

21. System according to claim 20, characterized in that the computer (26) of the credit holder is suitable for sending to the first SMS device (3) a sixth SMS message (29) containing said variable data (25) and/or said credit amount (28).