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(54) **Method for the management and control of pay parking areas and relative system**

(57) Method for the management and control of at least one pay parking area (80) comprising a series of parking lots (81), each parking lot (81) being equipped with an identification code (82), the method comprises the following phases:

a) receiving a first parking-start signal from a mobile communication device (20), corresponding to a parking lot (81) having an identification code (82),

c) calculating the cost of the parking period on said parking lot (81) having an identification code (82),
d) charging the cost of the parking period on the parking lot (81) having an identification code (82) to a user associated with the mobile communication device (20).

A system (10) for the management and control of at least one parking area (80) equipped with a series of parking lots (81) each equipped with an identification code (82) for univocally identifying it.

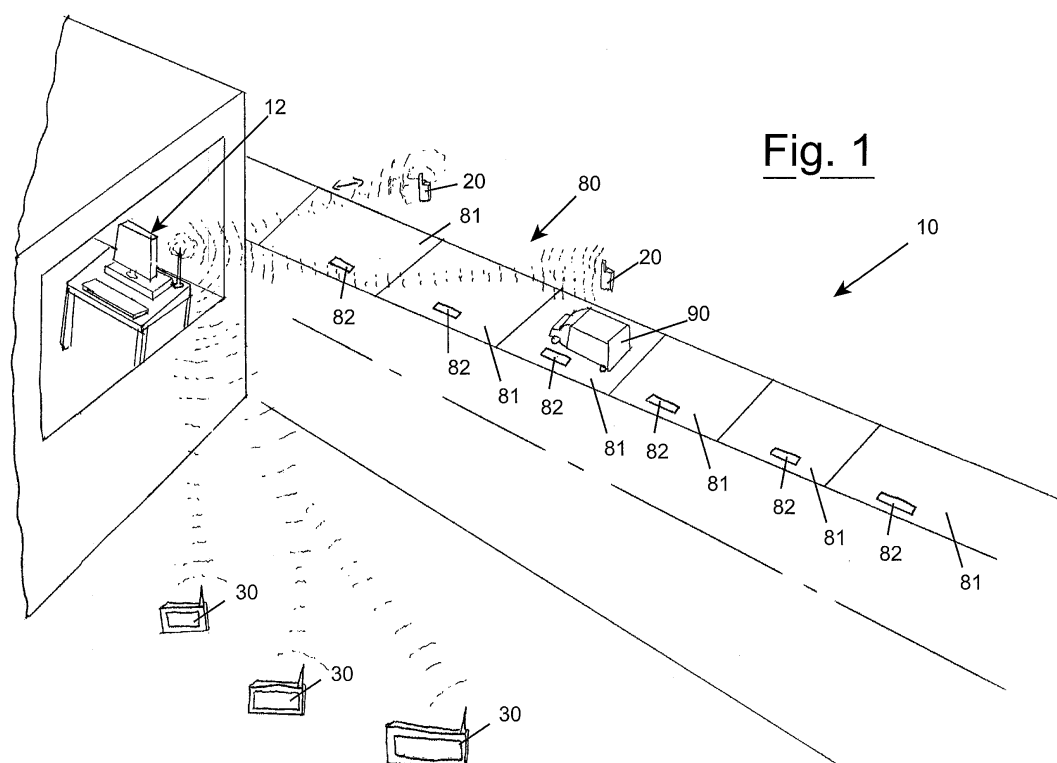


Fig. 1

Description

[0001] The present invention relates to a method for the management and control of pay parking areas and the relative management and control system.

[0002] In the present state of the art, there are numerous methods and systems for the management and control of parking areas and in particular pay parking areas.

[0003] A first type has a series of specific fixed terminals with which the payment is paid, in cash or with credit cards, at the moment of parking.

[0004] After receiving a receipt or ticket from one of the fixed terminals, this must be placed in a clearly visible position on the means of transport.

[0005] If the parking period must be prolonged, it is necessary to repay, again in cash, by means of one of said fixed terminals and reposition a new payment receipt on the means of transport.

[0006] A first disadvantage lies in the fact that it is necessary to install a series of fixed terminals for the payment and printing of the receipt over the whole pay parking area.

[0007] A second disadvantage is that the series of fixed terminals requires periodic maintenance, both for removing the cash and for refurbishing the fixed terminals with paper and/or ink to allow their normal functioning.

[0008] Furthermore, when there is a prolonged parking period, it is absolutely necessary to return to the parking place of the means of transport and after repaying by means of the specific fixed terminals, an additional receipt or ticket must be placed in a visible position on the means of transport.

[0009] This is to allow it to be controlled by a traffic warden or parking attendant.

[0010] Yet another disadvantage of this type of system and method is that these often imply the use of cash, which can be subject to falsification and/or theft, for both payment by means of specific terminals, positioned close to the pay parking areas, and also in the case of direct payment to a nearby operator.

[0011] Other payment methods and systems exist, which avoid pre-established parking periods, but which imply the use, however, of a payment receipt or ticket which contains information on the parking-start time.

[0012] These systems and methods however can only be used in the case of fenced parking areas with controlled access.

[0013] These areas are in fact equipped with bars which open automatically after receiving a receipt or ticket for the entrance of the vehicle, whereas the exit of the vehicle, again with the use of the same receipt, must be habilitated in particular by an operator.

[0014] Said habilitation is only obtained after the payment of the parking period.

[0015] In any case, these systems imply the use of terminals for supplying the receipt, with the problems indicated above relating to maintenance and payment.

[0016] An objective of the present invention is to provide

a method for the management and control of pay parking areas and a relative management and control system thereof which avoid the circulation and handling of cash for the payment of the parking period.

[0017] Another objective is to provide a method for the management and control of pay parking areas and a relative management and control system thereof which allow a reduction in the costs and maintenance of fixed terminals for the management and control of pay parking areas.

[0018] A further objective is to provide a method for the management and control of pay parking areas and a relative management and control system thereof which avoid to install fixed terminals for the management and for the payment positioned close to the parking areas.

[0019] A further objective is to provide a method for the management and control of pay parking areas and a relative management and control system thereof which avoid or reduce to the minimum the production of paper for the management and control of pay parking areas.

[0020] A last objective is to provide a method for the management and control of pay parking areas and a relative management and control system thereof which are simple and economically advantageous.

[0021] These objectives according to the present invention are achieved by providing a management and control method of pay parking areas and a relative management and control system thereof as indicated in claims 1 and 19.

[0022] Further characteristics of the invention are specified in the subsequent claims.

[0023] The characteristics and advantages of a method for the management and control of pay parking areas and a relative management and control system thereof according to the present invention will appear more evident from the following illustrative and nonlimiting description, referring to the enclosed schematic drawings, in which:

figure 1 is a schematic view of a preferred embodiment of a management and control system of at least one pay parking area according to the present invention.

[0024] With reference to the figure, this shows preferred embodiments of a system 10 and a method for the management and control of at least one pay parking area 80.

[0025] Said at least one pay parking area 80 comprises a series of parking lots 81 each of which is equipped with an identification code 82, which identifies it univocally.

[0026] Each parking lot 81 is in particular a pay parking lot for a means of transport 90 and/or a housing module, not shown.

[0027] Said housing module can be a camper or one or more tents, for example.

[0028] These in particular, in the case of pay parking lots 81 of a camping site or in the case of pay lots for

similar uses.

[0029] The management and control method comprises the following phases:

- a) receiving a first parking-start signal from a mobile communication device 20, corresponding to a parking lot 81 having an identification code 82,
- c) calculating the cost of the parking period on said parking lot 81 having an identification code 82,
- d) charging said cost of the parking period on said parking lot 81 having said identification code 82 to a user associated with said mobile communication device 20.

[0030] Phase a) preferably comprises the following phases:

- e) receiving a first identification code 82 of a corresponding occupied or vacant parking lot 81 from a mobile communication device 20,
- f) receiving a second identification code corresponding to the mobile communication device 20 which sent the identification code 82,
- g) memorizing said first identification code 82 and said second identification code of said mobile communication device 20.

[0031] According to a further preferred embodiment, said phase a) comprises the following phases:

- u) receiving a second identification code from a mobile communication device 20 associated with a user who wishes to reserve or in any case occupy a vacant parking lot 81,
- v) sending a first identification code 82 of a corresponding vacant parking lot 81 to said mobile communication device 20,
- g) memorizing said first identification code 82 and said second identification code of said mobile communication device 20.

[0032] Phase a) preferably comprises phase h): memorizing a first parking-start time, substantially corresponding to the reception or sending of said first identification code 82, or i) starting the monitoring of the parking time relating to said parking lot 81 corresponding to said identification code 82.

[0033] Phase a) preferably comprises a phase j) associating "occupied" logic value with said identification code 82.

[0034] Phase a) preferably comprises a phase k): sending a parking-start message of confirmation corresponding to said parking lot 81 having a corresponding identification code 82, to said mobile communication device 20.

[0035] Said method preferably comprises a phase w): preventing a vehicle 90 associated with a mobile communication device 20 having an identification code dif-

ferent from said second identification code, from occupying said parking lot 81.

[0036] Said method preferably comprises a phase b): receiving a second parking-end signal relating to said parking lot 81 having said identification code 82, from said mobile communication device 20.

[0037] Said phase b) preferably comprises phase m): memorizing a second parking-end time, substantially corresponding to the reception of said second parking-end signal relating to said parking lot 81 having said identification code 82 or preferably phase n): stopping the monitoring of the parking time relating to said parking lot 81 corresponding to said identification code 82 so as to directly obtain the total parking time of a means of transport 90 with respect to a certain parking lot 81 univocally identified by its corresponding identification code.

[0038] Said phase n) preferably takes place in correspondence with a parking time received with said first parking-start signal or predefined a priori.

[0039] Said phase c) preferably comprises the following phase:

- o) calculating the total parking time on said parking lot 81 having said identification code 82 of a means of transport 90, on the basis of said first parking-start time and said second parking-end time.

[0040] Said phase c) preferably comprises the following phase:

- p) calculating the cost of the parking on the basis of the total parking time on the parking lot 81 having said identification code 82.

[0041] Said phase d) preferably comprises phase q): charging said parking cost to a prepaid account or other type of account directly associated with the owner of said mobile communication device 20 or with the owner of said vehicle 90.

[0042] The reason for this is that the parking time could be paid by a passenger of the means of transport 90 instead of by the owner of the means of transport 90 itself.

[0043] The parking time is charged to an account associated with the owner of the mobile communication device 20 or is detracted from a prepaid account as for example prepaid movements of the mobile communication device 20.

[0044] Said phase d) preferably comprises a phase r): sending a parking-end message to said mobile communication device 20 relating to the parking lot 81 with respect to the identification code 82 and even more preferably also the total cost of the parking period.

[0045] Said phase d) preferably comprises a phase s) associating the "free" logic value with said identification code 82.

[0046] Said phase a) and said phase b) preferably take place contemporaneously for example by sending a single informative signal according to a pre-established type

of protocol.

[0047] In other words, it is possible to receive in particular by means of a main server unit 12 a message from a mobile communication device 20 preferably containing the identification code 82 of a parking lot 81 and a pre-

[0048] Should the parking time be reduced or prolonged, it is possible to send a further parking-end signal, thus repeating phase b).

[0049] According to another aspect of the present invention, an electronic processor program is provided, comprising processor codified program means adapted for effecting all the phases of the management and control method of at least one parking area 80 according to the present invention when said program is effected on an electronic processor.

[0050] In particular, said electronic processor program is englobed in a device which can be read by an electronic processor.

[0051] According to a further aspect of the present invention, a management and control system 10 is provided of at least one pay parking area 80.

[0052] Said at least one parking area 80 comprises a series of parking lots 81, each of which can be univocally identified.

[0053] Each parking lot 81 is preferably a parking lot for a means of transport 90 and/or a housing module.

[0054] For the sake of simplicity, reference is made to a preferred embodiment of a system 10 for the management and control of at least one pay parking area 80 for means of transport 90, without however limiting the meaning of the present invention.

[0055] The system 10 comprises a remote-control main server unit 12, capable of communicating with a series of mobile communication devices 20 such as for example a series of cellular or palm-sized telephones.

[0056] The system 10 comprises a series of identification elements or codes 82 each of which is associated with a corresponding parking lot 81 and furthermore each of which is positioned or produced respectively in correspondence with a parking lot 81 so that it can be univocally identified.

[0057] Each mobile communication device 20 is suitable for sending an identification code 82 of a corresponding parking lot 81 to the main remote server unit 12.

[0058] Each mobile communication device 20 is preferably a cellular or palm-sized communication device capable of communicating by means of a standard protocol such as for example the GSM or GPRS or UMTS protocol.

[0059] According to a preferred embodiment of the present invention, said system 10 comprises a series of blockage devices, not shown, each of which associated with a corresponding parking lot 81, in order to prevent parking thereon, should this have been reserved or occupied by remote-control.

[0060] The management and control system 10 comprises a series of mobile control devices 30, which can

also be in particular cellular or palm-sized or similar.

[0061] By means of the series of mobile control devices 30 it is possible to verify the effective state of each parking lot 81, i.e. to verify for each parking lot 81 whether this is effectively vacant or occupied.

[0062] If a parking lot 81 which should be vacant is instead occupied, it is possible to verify if the parked means of transport 90 or living module is equipped with alternative means of payment for the parking, such as for example common receipts or tickets of the known type, proving payment of the parking lot.

[0063] If not even alternative means of payment for the parking have been used, it is possible to issue a fine, and/or remove the vehicle 90 and/or send or record the identification code 82 of the parking lot 81 which is abusively occupied and the number-plate of the vehicle 90 which is abusively occupying said parking lot 81.

[0064] Each mobile control device 30 preferably comprises a display on which the list of identification codes and relative "state", i.e. "vacant" or "occupied", of the occupied and/or vacant parking lots 81 are visualized, so as to be able to effect verifications and controls on at least one pay parking area 80.

[0065] It is advantageously possible, by means of the present invention, to associate a corresponding identification code 82 with each parking lot 81 so that the parking period and payment of the parking lot 81 can be automatically managed and controlled.

[0066] According to another advantageous aspect of the present invention, it is also possible to manage and control pay parking areas by remote control, i.e. without the aid of fixed devices installed on the territory, thus avoiding not only their cost but also their maintenance, and possible tampering therewith with consequent inefficiency for the use of pay parking areas.

[0067] In this way, it is advantageously possible to avoid the use and above all the circulation and handling of cash for the payment of parking on parking lots 81 of at least one pay parking area.

[0068] It is also possible to dematerialize the receipt, which, at the discretion of the user, can in any case be printed out at a subsequent moment.

[0069] It can thus be seen that a method for the management and control of pay parking areas and a relative management and control system thereof according to the present invention achieves the objectives listed above.

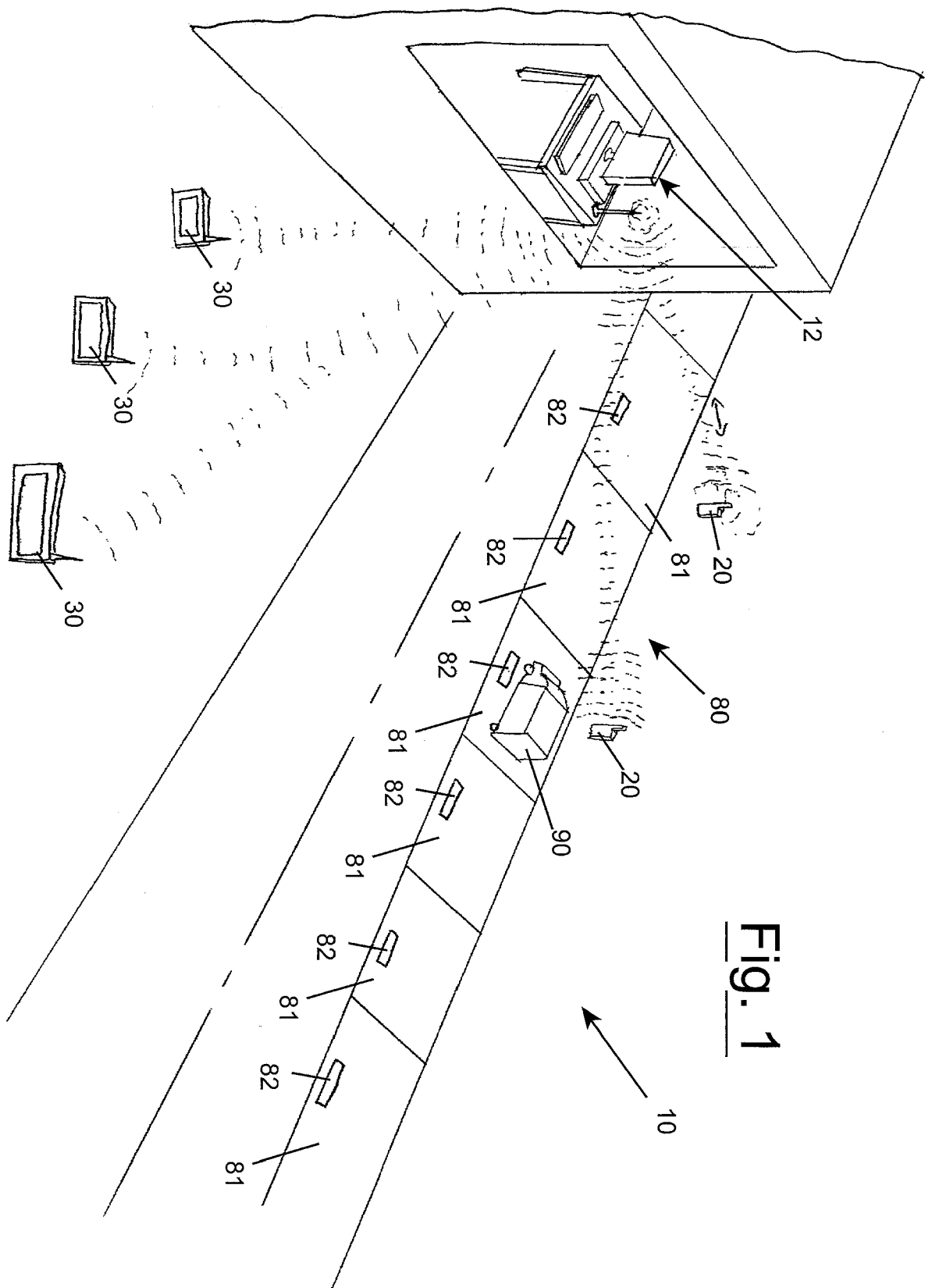
[0070] The method for the management and control of pay parking areas and a relative management and control system thereof according to the present invention thus conceived can undergo numerous modifications and variants, all included in the same inventive concept.

[0071] Furthermore, in practice, the materials used as also the dimensions and components, can vary according to technical requirements.

Claims

1. A method for the management and control of at least one pay parking area (80) comprising a series of parking lots (81), each parking lot (81) being equipped with an identification code (82), said method comprises the following phases:
 - a) receiving a first parking-start signal corresponding to a parking lot (81) having an identification code (82), from a mobile communication device (20),
 - c) calculating the cost of the parking period on said parking lot (81) having said identification code (82),
 - d) charging said cost of the parking period on the parking lot (81) having said identification code (82) to a user associated with said mobile communication device (20).
2. The method according to claim 1, **characterized in that** said phase a) comprises the following phases:
 - e) receiving a first identification code (82) of a corresponding occupied or vacant parking lot (81) from a mobile communication device (20),
 - f) receiving a second identification code corresponding to said mobile communication device (20),
 - g) memorizing said first identification code (82) and said second identification code of said mobile communication device (20).
3. The method according to claim 1, **characterized in that** said phase a) comprises the following phases:
 - u) receiving a second identification code from a mobile communication device (20) associated with a user who wishes to reserve or in any case occupy a vacant parking lot (81),
 - v) sending a first identification code (82) of a corresponding vacant parking lot (81) to said mobile communication device (20),
 - g) memorizing said first identification code (82) and said second identification code of said mobile communication device (20).
4. The method according to any of the claims from 1 to 3, **characterized in that** said phase a) comprises the following phase:
 - h) memorizing a first parking-start time, substantially corresponding to the reception or sending of said first identification code (82).
5. The method according to any of the claims from 1 to 3, **characterized in that** said phase a) comprises the following phase:
 - i) starting the monitoring of the parking time relating to said parking lot (81) corresponding to said identification code (82).
6. The method according to any of the claims from 1 to 5, **characterized in that** said phase a) comprises the following phase:
 - j) associating the "occupied" logic value with said identification code (82).
7. The method according to any of the claims from 1 to 6, **characterized in that** said phase a) comprises the following phase:
 - k) sending a parking-start message of confirmation corresponding to said parking lot (81) having a corresponding identification code (82), to said mobile communication device (20).
8. The method according to any of the claims from 3 to 7, **characterized in that** it comprises the following phase:
 - w) preventing a vehicle (90) associated with a mobile communication device (20) having an identification code different from said second identification code, from occupying said parking lot (81).
9. The method according to any of the claims from 1 to 8, **characterized in that** it comprises the following phase:
 - b) receiving a second parking-end signal relating to said parking lot (81) having said identification code (82), from said mobile communication device (20).
10. The method according to claim 9, **characterized in that** said phase b) comprises the following phase:
 - m) memorizing a second parking-end time, substantially corresponding to the reception of said second parking-end signal relating to said parking lot (81) having said identification code (82).
11. The method according to any of the claims from 5 to 9, **characterized in that** it comprises the following phase:
 - n) stopping the monitoring of the parking time relating to said parking lot (81) corresponding to said identification code (82) so as to directly obtain the total parking time of a means of transport (90) with respect to a certain parking lot (81) univocally identified by its corresponding identification code.

12. The method according to claim 11, **characterized in that** said phase n) takes place in correspondence with a parking time received with said first parking-start signal or predefined a priori.
13. The method according to claim 10, **characterized in that** said phase c) comprises the following phase:
- o) calculating the total parking time on said parking lot (81) having said identification code (82) of a means of transport (90), on the basis of said first parking-start time and said second parking-end time.
14. The method according to claim 11 or 12 or 13, **characterized in that** said phase c) comprises the following phase:
- p) calculating the cost of the parking on the basis of the total parking time on the parking lot (81) having said identification code (82).
15. The method according to any of the claims from 1 to 14, **characterized in that** said phase d) comprises the following phase:
- q) charging said parking cost to a prepaid account or other type of account directly associated with the owner of said vehicle (90) or with the owner of said mobile communication device (20).
16. The method according to any of the claims from 1 to 15, **characterized in that** said phase d) comprises the following phase:
- r) sending a parking-end message to said mobile communication device (20) relating to the parking lot (81) with respect to the identification code (82) and even more preferably also the total cost of the parking period.
17. The method according to any of the claims from 1 to 16, **characterized in that** said phase d) comprises the following phase:
- s) associating the "free" logic value with said identification code (82).
18. An electronic processor program comprising processor codified program means adapted for effecting all the phases of the management and control method of at least one pay parking area (80) according to any of the claims from 1 to 17 when said program is effected on an electronic processor.
19. The electronic processor program according to claim 18, **characterized in that** said program is englobed in a means which can be read by an electronic processor.
20. A management and control system (10) of at least one pay parking area (80), said parking area (80) comprises a series of parking lots (81), **characterized in that** it comprises a remote-control main server unit (12), capable of communicating with a series of mobile communication devices (20), a series of identification elements or codes (82) each of which is associated with a corresponding parking lot (81) and furthermore each of which is positioned or produced respectively in correspondence with a parking lot (81) so that it can be univocally identified.
21. The system (10) according to claim 20, **characterized in that** each mobile communication device (20) is also suitable for sending an identification code (82) of a corresponding parking lot (81) to said remote-controlled main server unit (12).
22. The system (10) according to claim 20 or 21, **characterized in that** it comprises a series of mobile control devices (30) whereby it is possible to verify the effective state of each parking lot (81).
23. The system (10) according to any of the claims from 20 to 22, **characterized in that** it comprises a series of blockage devices, each of which associated with a corresponding parking lot (81), in order to prevent parking on said parking lot (81), should this have been reserved or occupied by remote-control.





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 06 12 0812

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Place of search The Hague		Date of completion of the search 19 December 2006	Examiner VAN DER HAEGEN, D
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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