(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
17 April 2014 (17.04.2014)

WIPO | PCT

(10) International Publication Number
WO 2014/059450 A1

(51) International Patent Classification:
G08G 1/14 (2006.01)

(21) International Application Number:
PCT/ZA2013/000049

(22) International Filing Date:
12 July 2013 (12.07.2013)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2012/07671 12 October 2012 (12.10.2012) ZA

(72) Inventor; and
(71) Applicant : **OOSTERBERG, Adrian Michael** [ZA/AU]; 24 Benton Grange Drive, Mornington, VIC, 3931 (AU).

(72) Inventor: **VAN DER BIJL, Hendrik**; 2 Sefton Grange, Mount Martha, VIC, 3934 (AU).

(74) Agent: **SIBANDA & ZANTWIJK**; PO Box 1615, Houghton, 2041, Johannesburg, Gauteng (ZA).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

— *of inventorship (Rule 4.17(iv))*

Published:

— *with international search report (Art. 21(3))*

— *with amended claims (Art. 19(1))*

(54) **Title**: METHOD FOR MONITORING PARKING BAY OCCUPANCY

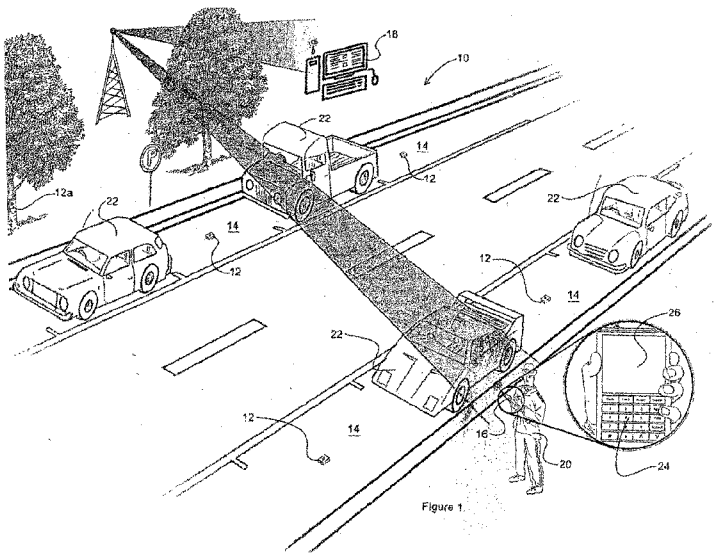

Figure 1

(57) **Abstract**: A parking monitoring system includes a device having a unique identifier; a reader that, when located in close proximity to the device, reads the unique identifier of the device; the device being located within a parking bay such that, when the parking bay is occupied by a vehicle, access to the device by the reader is restricted, thereby restricting the reader's ability to read the unique identifier of the device; and a database that stores the status of the parking bays; and the steps of: instructing a user via the reader within a predetermined time period to read the unique identifier of the device in a bay that, according to the database, is vacant; and locating the reader within such predetermined time period in close proximity to such device to read the unique identifier of such device and thereby confirm the vacant status of such bay on the database.

WO 2014/059450 A1

METHOD FOR MONITORING PARKING BAY OCCUPANCY

BACKGROUND

The present invention relates to a parking bay occupancy monitoring system and method. More particularly, the invention relates to a system to monitor parking marshals responsible for selling parking time to motorists using identifiers located within parking bays that communicate with a portable reader when the two are in close proximity to each other.

Various parking monitoring systems utilising sensors and/or readers are known. However, these are typically wholly automated systems intended to dispense with or reduce the need for parking marshals / wardens. For example: US5,351,187 to HASSETT describes a transponder in a vehicle that communicates with a reader at the roadside; US5,414,624 to ANTHONYSON describes a reader that communicates with cars using RF signals; US5,432,508 to JACKSON and US6,142,702 to SIMMONS describe sensors located above a parking bay that determines whether the parking bay is occupied or vacant; US5,504,314 to FARMONT describes sensors located above parking bays to monitor and regulate movement of vehicles within a parkade; US6,107,942 to YOO, KLIM and PAHNG, US6,285,297 to BALL and US2005/0068196 to MARIN use video cameras or optical surveillance to determine whether parking bays are occupied; US6,266,609 to FASTENRATH describes sensors communicating with a remote control centre for monitoring and controlling parking remotely; US6,823,317 to QUIMET and LEOUTSARAKOS describes a roadside payment terminal that transmits vehicle and parking bay data wirelessly to portable terminals used by parking marshals / wardens to control parking; US6,889,899 to SILBERBERG describes a roadside sensor combined with a payment system using a cellular telephone; US7,492,283 to RACUNAS and US2012/0143657 to SILBERBERG describes a parking system with sensors that updates a web interface; US2007/0257818 to AUBREY, BRAUKMANN and KREBS describes a parking sensor linked to a central payment terminal; US2011/0102197 describes a sensor in or near a parking bay combined with a means for signalling a vacant bay to drivers; and US2011/0133958 to CARBOON, TOAL and DEL PAPA describes a sensor located within a parking bay for detecting the

presence of a vehicle and notifying a parking officer via a portable HDD device of potential parking infringements.

However, the above prior art does not address drawbacks associated with systems that rely on parking marshals accurately to monitor parking use. Such systems rely on the integrity of parking marshals to capture information accurately, receive payment(s) and pass those payments on to their employer.

The parking monitoring system according to the present invention aims to provide a system that improves the integrity / accuracy of information received from parking marshals.

SUMMARY OF THE INVENTION

According to a preferred embodiment of the present invention there is provided a parking monitoring system that includes:

a device having a unique identifier;

a reader that, when located in close proximity to the device, reads the unique identifier of the device;

the device being located within a parking bay such that, when the parking bay is occupied by a vehicle, access to the device by the reader is restricted, thereby restricting the reader's ability to read the unique identifier of the device; and

a database that stores the status of the parking bays; and

the steps of:

instructing a user via the reader within a predetermined time period to read the unique identifier of the device in a bay that, according to the database, is vacant; and

locating the reader within such predetermined time period in close proximity to such device to read the unique identifier of such device and thereby confirm the vacant status of such bay on the database.

Typically, the device is located substantially centrally within the parking bay.

Typically, the device is a contactless device, a RFID pod or a pod containing a RFID card or tag.

Preferably, the reader communicates with the database via a cellular network.

Generally, the reader includes a timer.

Typically, the reader includes an output device for communicating an instruction to a user.

Preferably, in order to confirm the vacant status of a parking bay on the database, the user must, on instruction, activate the timer and read the unique identifier of the device associated with such parking bay within a set timespan. Accordingly, should the user fail within either the predetermined time period or the set timespan to read the unique identifier of the device associated with the parking bay which status is to be confirmed, the status of that parking bay is updated on the database to occupied.

Generally, the reader includes a screen for displaying the parking bays and the status of each parking bay.

Typically, the parking monitoring system further includes a camera that communicates with the reader or database, for capturing photographs of vehicles or registration discs of vehicles.

Preferably, the camera is incorporated in the reader.

Generally, the reader or the camera further includes optical character recognition or barcode reading software for reading the number plates or registration disc details in photographs taken by the camera.

Typically, in respect of each parking bay that has an occupied status, the reader or camera associates and stores at least one photograph of the vehicle parked in the parking bay and/or the vehicle number plate or registration disc details.

Preferably, in order to confirm the occupied status of a parking bay on the database, the user is required to take a photograph of the vehicle in the parking bay or its registration disc.

Generally, the parking monitoring system records instances where photographs of vehicles with different number plates or registration disc details are associated with a parking bay without the status of the parking bay having been updated to vacant during the intervening period.

Typically, where a vehicle has parked in a parking bay without payment, the user via the camera captures a photograph of the vehicle or its registration disc while the device records: (i) the GPS co-ordinates of the location where the photograph was taken; (ii) the compass direction in which the camera faced when taking the photograph; and (iii) the time at which the photograph was taken.

Preferably, the photograph, the GPS co-ordinates, the compass bearing and the time are combined in one composite image.

Generally, the composite image is used to issue a fine, violation notice, infringement notice or penalty notice to the owner of the vehicle.

Typically, the system further includes an additional device with a unique identifier that is not located within a parking bay, which additional device is used by the user to "clock-in" and "clock-out".

Preferably each parking bay includes two devices.

Generally, the user is required to use the reader to read the unique identifier of each device at least once per day.

BRIEF DESCRIPTION OF THE DRAWINGS

A preferred embodiment of the invention will now be described in more detail, by way of example only, with reference to the accompanying drawing in which:

Figure 1 is a perspective view of a parking bay occupancy monitoring system according to the present invention.

DESCRIPTION OF A PREFERRED EMBODIMENT OF THE INVENTION

With reference to Figure 1, according to a preferred embodiment of the invention a parking bay occupancy monitoring system and method 10 is provided for improving the integrity of information received from parking marshals.

The system 10 includes a device 12 with a unique identifier (UID) (not shown) located within a parking bay 14 and a reader 16.

The device 12 is a contactless ID device (such as a RFID pod or a pod containing a RFID card / tag) and is mounted on or in the road surface substantially centrally within the parking bay 14 (i.e. within a radius of 20cm cm of the centre of the bay 14). A UID device 12 is located in each bay 14 within a parking precinct.

The reader 16 is a hand-held, portable device that communicates with a remote central database 18 (e.g. by cellular communication or via wifi and internet cables). The reader 16 includes a short-range communication means (not shown) capable of reading the UID of a UID device 12 when placed in close proximity to such device 12 (e.g. within 5cm cm of the UID device 12).

The system 10 is best explained by way of example, starting at the beginning of a parking marshal's 20 shift at an empty parking precinct.

The day starts with the parking marshal "clocking in" by placing the reader 16 next to an additional / specific UID device 12a not located within a parking bay to read its UID. This causes the reader 16 and/or the remote database 18 to record the time that the parking marshal 20 starts his/her shift. The parking marshal 20 then reads the UID of the UID devices 12 in all the vacant parking bays 14 within his/her parking precinct. The reader 16 and/or remote database 18 associates the UID of each reader with a specific parking bay 14 and records the status of each parking bay 14 as "vacant".

If a bay 14 is occupied by a vehicle 22, the parking marshal 20 must record the status of the bay 14 as "occupied", which entry may be transmitted to the remote database 18.

After expiry of a predetermined period (e.g. 15 minutes), all bays 14 which: (i) UID devices 12 have not been read; or (ii) have not been recorded as "occupied", will be recorded by the reader 16 and/or remote database 18 as "occupied".

As a vehicle 22 occupies a parking bay 14, the parking marshal 20 logs the bay as "occupied" on the reader 16 using an input device 24 (such as a keyboard with display or touch screen) on the reader 16. This changes the status of that bay 14 on the reader 16 and/or remote database 18 to "occupied".

It will be appreciated that, with a vehicle 22 occupying a parking bay 14, access to the UID device 12 is restricted. And, the parking marshal 20 is no longer easily able to locate the reader 16 in close proximity to the UID device 12 (which is now located underneath the vehicle 22) to read the UID of the UID device 12.

Should a vehicle 22 leave a parking bay 14, the parking marshal 20 locates the reader 16 in close proximity to the now uncovered UID device 12 to read its UID and thereby change the status of the bay 14 to "vacant" on the reader 16 and/or remote database 18.

To ensure that the status of the parking bays 14 on the reader 16 and/or remote database 18 is correct, the reader 16 randomly (e.g. at intervals not exceeding 20 minutes) instructs the parking marshal 20 within a predetermined time period (e.g. 15 minutes) to confirm the status of a randomly selected bay 14 that is recorded on the reader 16 and/or remote database 18 as "vacant". Such instruction can be accompanied by an audible alarm that must be deactivated by the parking marshal 20. In response to the instruction, the marshal 20 is required to: (i) approach the selected bay 14; (ii) activate a timer (not shown) on the reader 16 (e.g. by pressing a button on the input device 24); and (iii) locate the reader in close proximity to the UID device 12 in that bay to read its UID within a set timespan (typically less than 5 seconds) of activating the timer.

It will be appreciated that this task will easily be performed if the selected bay 14 is in fact vacant, but that this task will be difficult to complete if the parking bay 14 is in fact occupied and the UID device 12 covered by a vehicle 22. If the task is successfully completed within both the first predetermined time period and the set timespan, the "vacant" status of the bay 14 on the reader 16 and/or remote database 18 is confirmed. Else, the status of the selected bay 14 is automatically updated to "occupied".

The reader 16 preferably includes a screen 26 that displays the bays 14 within a parking marshal's 20 parking precinct with associated icons indicating whether the bays are "vacant" or "occupied".

At the end of his/her shift, the parking marshal 20: reads the UIDs of all UID devices 12 in vacant bays 14 within his/her parking precinct; and places the reader 16 near to the additional / specific UID device 12a to "clock out".

The parking marshal then reports to his/her employer, where the payments received by the parking marshal 20 are compared against the anticipated receipts, calculated having regard to the bay 14 occupancy as recorded by the reader 16 and/or remote database 18. The parking marshal's employer can then respond to any discrepancy between actual receipts and anticipated receipts.

It will be appreciated that each parking bay 14 may include a second UID device 12 (not shown) with its own unique identifier. This redundancy will ensure continued operation of the system 10 should one of the UID devices 12 fail. The parking marshal 20 is preferably required to read the UID of both UID devices 12 at least once per day to confirm that they are both operating properly. Where a UID device 12 has not been "read" within the previous 24 hours, the status of that UID device 12 on the remote database 18 will automatically be changed to "potentially defective" and the parking marshal 20 will be instructed via the reader 16 to "read" that UID device 12. If no such "reading" is made successfully within a given time period (e.g. 30 minutes", the status of the UID device on the remote database 18 will be updated to "defective" and the remote database 18 will instruct a team to test and replace the "defective" UID device 12 (if required).

It will also be appreciated that the database 18 may be built into the reader 16. Furthermore, the database 18 need not necessarily use the terms "vacant" or "occupied" to set the status of the parking bays 14. Any other suitable terms may be used, provided that they represent the parking bay 14 as either vacant or occupied.

Furthermore, it will be appreciated that although the device 12 and reader 16 have been described as communicating using radio frequency, the device 12 could alternatively include a unique identifier displayed as a 1D, 2D or 3D barcode, QR code or other digital or optical code that is read by the reader 16. Furthermore, device 12 and reader 16 could communicate using short range ultrasonic or other audio waves, short range directional infrared waves or short range RF communication. Alternatively the means of communication

between the device 12 and reader 16 could be of a mechanical means involving contact or near contact whereby the device 12 has a profiled code (typically including recessed portions and/or protruding portions) which is read by the reader 16 which typically includes switches or sensors. Accurate positioning of the reader 16 to device 12 could typically be via a locating pin or other physical or visual means.

The reader 16 or remote database 18 could also communicate with a digital camera 28. Preferably, the camera 28 is incorporated in the reader 16. A parking marshal 20 could use the camera 28 to take photographs of vehicles 22 parked within parking bays 14 or photographs of 1D or 2D bar codes on vehicles' 12 registration discs. For example, after updating the status of a parking bay 14 to "occupied", the reader 16 or remote database 18 could prompt the parking marshal 20 to take a photo of the vehicle 12 (including its number plate or registration disc details) occupying the parking bay 14. Optical character recognition or bar code reading software installed on the reader 16 or camera 28 could recognize the number plate or registration disc details of the vehicle 12 and associate the photograph and/or the number plate or registration disc details with the "occupied" parking bay 14. In a similar manner as the reader 16 randomly instructs the parking marshal 20 to confirm the status of a randomly selected bay 14 that is recorded on the reader 16 and/or remote database 18 as "vacant", the reader 16 or remote database 18 could randomly instruct the parking marshal 20 to confirm the status of a randomly selected bay 14 that is recorded on the reader 16 and/or remote database 18 as "occupied" by requiring the parking marshal 20 within a predetermined time period (e.g. 15 minutes) to take a photo of the vehicle 12 (including number plate or registration disc) parked in the selected parking bay 14. Should the number plate or registration disc details of the vehicle 12 in the photograph match the number plate or registration disc details associated with the parking bay 14, this procedure will confirm that the same vehicle 12 continues to occupy the parking bay 14. However, should the number plate or registration disc details differ, the reader 16 and/or remote database 18 could flag the instance for further investigation and record the previous vehicle 12 as having left the parking bay 14, as the vehicles 12 parked in a parking bay 14 should not change without the status of the parking bay 14 being updated to "vacant" in the intervening period.

The camera 28 could also be used to take photographs of vehicles 12 (including their number plates or registration disc details) that have illegally parked in parking bays 14 without payment or parking illegally in no parking zones, such as on red and yellow lines. Preferably, when taking such photographs, the reader 16 also records: (i) the GPS co-ordinates of the location at which the photograph is taken; (ii) the compass direction in which

the camera 28 faced when taking the photograph (i.e. the compass bearing); and (iii) the time at which the photograph is taken. The system 10 could then generate a composite image (including the photograph of the vehicle 12 or registration disc, the GPS co-ordinates and the time and compass bearing) for inclusion in a parking fine, violation notice, infringement notice or penalty notice to be sent to the owner of the vehicle 12.

Although the camera 28 has been described as incorporated with the reader 16, it will be appreciated that the camera 28 could be separate from, but communicable with the reader, via Bluetooth, wifi, a cable, or similar means or communicate directly with the remote database 18.

CLAIMS

1. A parking monitoring system including:

a device having a unique identifier;

a reader that, when located in close proximity to the device, reads the unique identifier of the device;

the device being located within a parking bay such that, when the parking bay is occupied by a vehicle, access to the device by the reader is restricted, thereby restricting the reader's ability to read the unique identifier of the device; and

a database that stores the status of the parking bays; and

the steps of:

instructing a user via the reader within a predetermined time period to read the unique identifier of the device in a bay that, according to the database, is vacant; and

locating the reader within such predetermined time period in close proximity to such device to read the unique identifier of such device and thereby confirm the vacant status of such bay on the database.

2. A parking monitoring system according to claim 1, wherein the device is located substantially centrally within the parking bay.

3. A parking monitoring system according to claim 2, wherein the device is a contactless device, a RFID pod or a pod containing a Mifare card or tag.

4. A parking monitoring system according to claim 3, wherein the reader communicates with the database via a cellular network.

5. A parking monitoring system according to claim 4, wherein the reader includes a timer.

6. A parking monitoring system according to claim 5, wherein the reader includes an output device for communicating an instruction to a user.

7. A parking monitoring system according to claim 6, wherein, in order to confirm the vacant status of a parking bay on the database, the user must activate the timer and read the unique identifier of the device associated with such parking bay within a set timespan.

8. A parking monitoring system according to claim 7, wherein, should the user fail within either the predetermined time period or the set timespan to read the unique identifier of the device associated with the parking bay which status is to be confirmed, the status of that parking bay is updated on the database to occupied.

9. A parking monitoring system according to claim 8, wherein the reader includes a screen for displaying the parking bays and the status of each parking bay.

10. A parking monitoring system according to claim 9, further including a camera that communicates with the reader or database, for capturing photographs of vehicles or registration discs of vehicles in parking bays.

11. A parking monitoring system according to claim 10, wherein the camera is incorporated in the reader.

12. A parking monitoring system according to claim 11, wherein the reader or camera further includes optical character recognition or barcode reading software for reading the number plate or registration disc in photographs taken by the camera.

13. A parking monitoring system according to claim 12, wherein, in respect of each parking bay that has an occupied status, the reader or camera associates and stores at least one photograph of the vehicle parked in the parking bay and/or the vehicle number plate or registration disc details.

14. A parking monitoring system according to claim 13, wherein, in order to confirm the occupied status of a parking bay on the database, the user is required to take a photograph of the vehicle in the parking bay or its registration disc.

15. A parking monitoring system according to claim 14, wherein the system records instances where photographs of vehicles or registration discs with different number

plates or registration disc details are associated with a parking bay without the status of the parking bay having been updated to vacant during the intervening period.

16. A parking monitoring system according to claim 15, wherein, where a vehicle has parked in a parking bay without payment or parked illegally, the user via the camera captures a photograph of the vehicle or its registration disc while the device records: (i) the GPS co-ordinates of the location where the photograph was taken; (ii) compass bearing; and (iii) the time at which the photograph was taken.

17. A parking monitoring system according to claim 16, wherein the photograph, the GPS co-ordinates, the compass bearing and the time are combined in one composite image.

18. A parking monitoring system according to claim 17, wherein the composite image is used to issue a fine, violation notice, infringement notice or penalty notice to the owner of the vehicle.

19. A parking monitoring system according to claim 18, wherein the system further includes an additional device with a unique identifier, which additional device is not located within a parking bay, which additional device is used by the user to "clock-in" and "clock-out".

20. A parking monitoring system according to claim 19, wherein each parking bay includes two devices.

21. A parking monitoring system according to claim 20, wherein the user is required to use the reader to read the unique identifier of each device at least once per day.

AMENDED CLAIMS
received by the International Bureau on 08 January 2014 (08.01.14)

1. A parking monitoring system including:

a device having a unique identifier;

a handheld, portable, short range reader with a range of no more than 5cm, for reading the unique identifier of the device when the reader is located in close proximity to the device;

the device being located within a parking bay such that, when the parking bay is occupied by a vehicle, access to the device by the reader is restricted, thereby restricting the reader's ability to read the unique identifier of the device; and

a database that stores the status of the parking bays; and

the steps of:

instructing a user via the reader within a predetermined time period to read the unique identifier of the device in a bay that, according to the database, is vacant; and

locating the reader within such predetermined time period in close proximity to such device to read the unique identifier of such device and thereby confirm the vacant status of such bay on the database.

2. A parking monitoring system according to claim 1, wherein the device is located substantially centrally within the parking bay

3. A parking monitoring system according to claim 2, wherein the device is a contactless device, a RFID pod or a pod containing a Mifare card or tag.

4. A parking monitoring system according to claim 3, wherein the reader communicates with the database via a cellular network.

5. A parking monitoring system according to claim 4, wherein the reader includes a timer.

6. A parking monitoring system according to claim 5, wherein the reader includes an output device for communicating an instruction to a user.

7. A parking monitoring system according to claim 6, wherein, in order to confirm the vacant status of a parking bay on the database, the user must activate the timer and read the unique identifier of the device associated with such parking bay within a set timespan.

8. A parking monitoring system according to claim 7, wherein, should the user fail within either the predetermined time period or the set timespan to read the unique identifier of the device associated with the parking bay which status is to be confirmed, the status of that parking bay is updated on the database to occupied.

9. A parking monitoring system according to claim 8, wherein the reader includes a screen for displaying the parking bays and the status of each parking bay.

10. A parking monitoring system according to claim 9, further including a camera that communicates with the reader or database, for capturing photographs of vehicles or registration discs of vehicles in parking bays.

11. A parking monitoring system according to claim 10, wherein the camera is incorporated in the reader.

12. A parking monitoring system according to claim 11, wherein the reader or camera further includes optical character recognition or barcode reading software for reading the number plate or registration disc in photographs taken by the camera

13 A parking monitoring system according to claim 12, wherein, in respect of each parking bay that has an occupied status, the reader or camera associates and stores at least one photograph of the vehicle parked in the parking bay and/or the vehicle number plate or registration disc details.

14. A parking monitoring system according to claim 13, wherein, in order to confirm the occupied status of a parking bay on the database, the user is required to take a photograph of the vehicle in the parking bay or its registration disc.

15. A parking monitoring system according to claim 14, wherein the system records instances where photographs of vehicles or registration discs with different number plates or registration disc details are associated with a parking bay without the status of the parking bay having been updated to vacant during the intervening period.

16. A parking monitoring system according to claim 15, wherein, where a vehicle has parked in a parking bay without payment or parked illegally, the user via the camera captures a photograph of the vehicle or its registration disc while the device records: (i) the GPS co-ordinates of the location where the photograph was taken; (ii) compass bearing; and (iii) the time at which the photograph was taken.

17. A parking monitoring system according to claim 16, wherein the photograph, the GPS co-ordinates, the compass bearing and the time are combined in one composite image.

18. A parking monitoring system according to claim 17, wherein the composite image is used to issue a fine, violation notice, infringement notice or penalty notice to the owner of the vehicle.

19. A parking monitoring system according to claim 18, wherein the system further includes an additional device with a unique identifier, which additional device is not located within a parking bay, which additional device is used by the user to "clock-in" and "clock-out".

20. A parking monitoring system according to claim 19, wherein each parking bay includes two devices.

21. A parking monitoring system according to claim 20, wherein the user is required to use the reader to read the unique identifier of each device at least once per day.

22. A method of monitoring a parking system including the steps of:

storing the status of parking bays on a database;

instructing a user via a handheld, portable reader to read the unique identifier of a device located within a selected parking bay that, according to the database, is vacant;

AMENDED SHEET (ARTICLE 19)

the user activating a timer on such handheld portable reader;
the user being required to locate the reader in close proximity to the device within the selected parking bay to read its unique identifier; and

either: (i) confirming the status of the selected parking bay where the unique identifier of the device is read within a predetermined time; or (ii) changing the status of the parking bay on the database to occupied where the unique identifier of the device is not read by the reader within a predetermined time.

23. A method according to claim 22, further including the step of the reader communicating with the database via a cellular network.

24. A method according to claim 23, further including the step of capturing photographs of vehicles or registration discs of vehicles in parking bays using a camera on the reader, and transmiting such data to the database.

25. A method according to claim 24, further including the step of performing optical character recognition or barcode reading upon the photographs to read the number plates.

26. A method according to claim 25, further including the step of, in respect of each parking bay that has an occupied status, the reader or camera associates and stores at least one photograph of the vehicle parked in the parking bay and/or the vehicle number plate or registration disc details.

27. A method according to claim 26, further including the step of taking a photograph of the vehicle in the parking bay or its registration disc to confirm the occupied status of a parking bay on the database.

28. A method according to claim 27, further including the step of capturing: (i) the GPS co-ordinates of the location where photographs are taken; (ii) the compass bearings when photographs are taken; and (iii) the time at which the photographs are taken.

29. A method according to claim 28, further including the step of creating a composite image for each photograph, the composite image including the photograph and the associated GPS co-ordinate, compass bearing and time.

30. A method according to claim 29, further including the step of the user "clocking-in" and "clocking-out" using an additional device with a unique identifier, which additional device is not located within a parking bay.

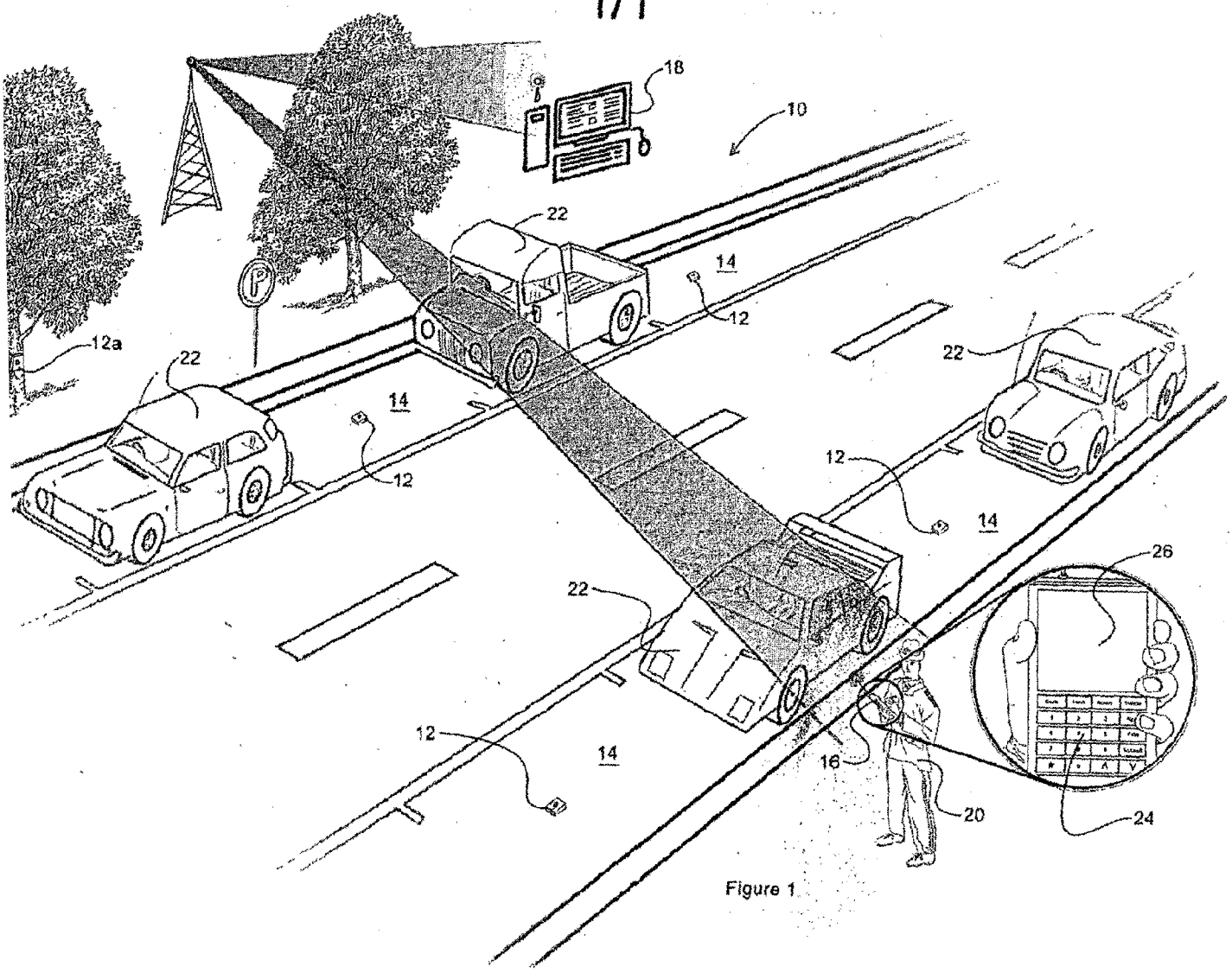

Figure 1

INTERNATIONAL SEARCH REPORT

International application No
PCT/ZA2013/000049

A. CLASSIFICATION OF SUBJECT MATTER
INV. G08G1/14
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
G08G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2002/030606 A1 (CHAUVIN GREG [CA] ET AL) 14 March 2002 (2002-03-14) paragraph [0004] - paragraph [0007] paragraph [0015] - paragraph [0018] paragraph [0023] - paragraph [0043]; claim 18; figures 1-6	1-6,9-21
A	US 2012/092189 A1 (JORDAN DWIGHT [US]) 19 April 2012 (2012-04-19) paragraph [0030] - paragraph [0038]; figures 6,7	1-3

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
7 November 2013	14/11/2013

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Wagner, Ulrich

1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/ZA2013/000049

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2002030606 A1	14-03-2002	CA 2318645 A1	12-03-2002
		US 2002030606 A1	14-03-2002
US 2012092189 A1	19-04-2012	AU 2011314016 A1	02-05-2013
		EP 2628148 A1	21-08-2013
		US 2012092189 A1	19-04-2012
		WO 2012050954 A1	19-04-2012